Mekong e-Sim: A Cross-Disciplinary Online Role-Play Simulation
The University of Adelaide, Australia

What is it?

The Mekong e-Sim is an online learning environment that uses simulation and role-playing to immerse students in the complexities of authentic decision making, helping them develop the communication, collaboration, and leadership skills they will need to be successful practitioners in their fields of expertise. By asking students to assume the identities of stakeholders in the Mekong River Basin of Southeast Asia and debate the merits of a proposed development project, the Mekong e-Sim offers a structured method of exposing students to the wide range of social, political, economic, and scientific conflicts that affect complex engineering projects, particularly those that may be multinational in scope. Engineering students from a range of fields (including civil, environmental, telecommunications, software, and mechanical) have used this learning tool to collaborate with students from different disciplinary backgrounds on authentic problems of global importance.

The Mekong River Basin was chosen as the setting for this exercise because the region includes six countries and a host of competing stakeholders—local villagers, governmental and nongovernmental organizations, international bodies, academic and research institutions, the media, and the engineers themselves. Each learning scenario is set in motion by a particular incident—usually a public inquiry into the merits of a proposed development to manage natural resources in the region (a large-scale hydropower project, for instance). Grouped in teams of two to four students, participants are briefed on the problem, acquainted with the various stakeholders and their conflicting interests, and asked to adopt the role of a particular party in the dispute. Students then spend two weeks researching the vantage point of their chosen role, including its responsibilities and typical strategic stances. This stage is followed by a two-week period of online interaction and debate as the student teams respond to key events and learn how their roles are interdependent, culminating in an online public inquiry during which they defend their positions. A period of structured reflection and synthesis known as “debriefing” follows, often conducted in face-to-face settings under the supervision of instructors.

Developed in 2001 primarily by the engineering schools of the University of Adelaide and the University of Technology, Sydney, the Mekong e-Sim experience is conducted during six weeks of a 13-week course of study that blends face-to-face interaction with online learning. The program, which takes 50–60 hours to complete, involves between 60 and 140 undergraduates per semester. It is hosted on the University of Adelaide’s course management system, allowing administrators to open temporary system access and external e-mail accounts for students enrolled at other institutions, thus overcoming some of the security concerns that accompany cross-institutional collaborations of this kind.

In 2004 and 2005, the University of Adelaide conducted assessments of the Mekong e-Sim using student surveys; an in-depth evaluation of social interactions within this asynchronous, nonverbal environment; and analysis of student debriefing essays. Survey responses from University of Adelaide students indicated that the experience contributed to the development of their communication and teamwork skills; 97 percent found their awareness of the complexity of sustainable development issues had increased; and 88 percent stated that the e-Sim taught them the requirements of working in an international environment. The evaluation identified a high level of social interaction, despite the environment’s reliance on e-mail and discussion forums, and found that students were generally satisfied with the quality of the exchanges. Furthermore, student feedback in 2004 resulted in improvements to the 2005 experience, including video clips of the Mekong River, interviews with previous participants (including debriefing sessions), audio-narrated presentations, and increased use of color, logos, and other images.

What problem does it solve?

The Mekong e-Sim is the product of collaboration among four faculty members at different institutions who came together to address a single pedagogical problem: although students were graduating with the technical skills to analyze and solve problems in their respective disciplines, they received little training in the “soft” skills of communication, collaboration, and leadership necessary to practice their profession in a multicultural, complex, and ambiguous world. The e-Sim was designed to ensure that engineering students met certain standards of excellence established by Engineers Australia, the country’s professional engineering association, including the ability to represent the need for sustainable development while working and communicating effectively in multidisciplinary and multicultural teams.
How did they do it?

Evidence suggests that the soft skills prized by professional associations are most effectively developed through learn-by-doing exercises, in which students learn inductively after being thrust into a realistic work situation. Scenario-based learning has been an integral part of traditional instruction, but by extending this approach into the online realm, educators are able to break down barriers of time, distance, and discipline to forge a multicultural and multidisciplinary learning community for students. With a wider range of values and interests represented in this environment, learners must respond to clear-cut differences in perspective that mirror the social dynamics a professional engineer regularly encounters.

Because the Mekong e-Sim’s learning objective was to teach engineering students the value of teamwork, sustainable development, and collaboration, the project’s developers were determined to model effective teamwork in their own efforts as they designed e-Sim scenarios, learning activities, and assessment rubrics. In fact, without coordination at the institutional level, the four developers (three subject specialists from different disciplines and one educational assessment expert) would not have been able to support this level of online collaboration among students at different universities. Negotiation among the project partners was required to address institutional differences, including disparity in resources and differences in disciplinary norms and values, institutional structures, workload distributions, grading practices, and student characteristics. Ultimately, the high level of student interdependence built into the project design demanded that resources be shared and teaching and assessment practices be standardized across participating universities.

To date, the contributing institutions have spent approximately AUS$10,000 on the project, primarily on travel expenses for the face-to-face planning and evaluation stages. The design and adaptation of the e-Sim to the University of Adelaide’s course management system software is estimated to have taken two person-months, and ongoing administration involves about two hours per day over the six-week cycle. Multimedia enhancements in 2005 took approximately two weeks to design, develop, and implement.

Building on the success of the Mekong e-Sim project, the University of Adelaide is developing additional cross-disciplinary online role-play simulations as part of its situated learning initiative. Already, the initiative has produced “Disaster Downunder: Through the Fire,” designed by the university’s Department of Clinical Nursing to expose students to the complexities of disaster management in the wake of the 2002 Bali bombings, when burn victims evacuated by the Australian Air Force crowded the country’s hospitals.

Why is it noteworthy?

- **Team-based learn-by-doing design:** The Mekong e-Sim provides an authentic learning and assessment environment in which students hone their problem-solving abilities and develop communication, collaboration, and leadership skills.

- **Flexible approach:** Designed to run on a commonly available platform, Mekong e-Sim is easily transferable and can accommodate geographically distributed students from different disciplines and institutions. The e-Sim can be adapted to emphasize different learning outcomes by modifying the scenarios, the stakeholder groups involved, and the events that lead to student interaction.

- **Learning effectiveness:** Randomly administered surveys indicate that students believe the Mekong e-Sim experience has achieved its learning goals of developing student awareness of sustainability issues, the multidisciplinary and multicultural dimensions of engineering issues, and the importance of teamwork, particularly in an international environment. The e-Sim has received several national and international awards.

To learn more

For further information regarding the Mekong e-Sim program, contact Holger Maier at the University of Adelaide at <hmaier@civeng.adelaide.edu.au>.

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