

Electronic Conferencing for Faculty Continuing Development

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Abstract

Many engineering faculty members in developing and emerging countries find it nearly impossible to participate in continuing professional development through attendance at major international conferences in their areas of interest. One mechanism to address this problem is the addition of an electronic conference component to major engineering education conferences, to allow distant participation in paper presentation and discussion by such faculty members. This paper describes two such electronic conferences, organized by the authors in conjunction with major international conferences – the 2001 annual meeting of the European Society for Engineering Education (SEFI) and the 2003 joint international conference of the American Society for Engineering Education (ASEE) and the World Federation of Engineering Organizations (WFEO). In each case, an electronic conference was run for several weeks before the live conference, with papers from distant engineering faculty members posted on a web site for discussion. Then a summary of the papers and the discussion was presented at a plenary session at the live meeting, with the session video taped with the intent of transmitting it back to the authors. In the case of the electronic conference held in conjunction with the WFEO/ASEE annual meeting, a summary paper of the plenary session was also produced for publication. Details of the process of organizing and conducting these electronic conferences are provided in the paper.

Introduction

The rationale behind an electronic conference is that engineering educators throughout the world need continued stimulation from colleagues in order to stay abreast of new developments in their field, and thus to stay relevant and up to date in their teaching. Active faculty members with adequate resources often accomplish this collegial interaction through participation in international conferences on engineering education, sponsored periodically by organizations such as UNESCO (United Nations Education, Science, and Cultural Organization), WFEO (World Federation of Engineering Organizations), SEFI (European Society for Engineering Education), and ASEE (American Society for Engineering Education), etc. Physical attendance at such conferences provides the positive benefit of face-to-face interaction with colleagues.

Unfortunately, engineering educators teaching in developing countries often do not have the resources to participate in such conferences. Travel expenses, conference registration fees, and on-site expenses are typically beyond their means. This often leads to a steady decline in their effectiveness as faculty members, as they fall increasingly behind new developments in engineering education.

Based on prior experience of the National Technological University, sufficient electronic communication technologies exist, at least in capital cities throughout the developing world, to allow participation in an electronic conference, so that engineering educators there are able to participate readily. In target developing countries (e.g. in Africa, Latin America, Asia, Central and Eastern Europe) the availability of Internet accessibility was assessed and determined able to provide effective access.

The electronic conferences described here were organized similar to traditional, place-bound conferences. Accepted papers were arranged into thematic sessions. This was accomplished on the worldwide web by placing related papers under various entry points from the main conference web site. The conference papers could be presented in text form or via web-based slides, a format common at conferences. PowerPoint could be used to generate the slide presentations and accompanying audio. The full text of each paper was available for either reading directly on the web or downloading for later reading and/or printing.¹

As is the case at traditional conferences, discussions related to individual papers were encouraged. Threaded discussion groups were associated with each individual paper to facilitate discussion between participants, including authors.

To stimulate the type of discussion that often occurs as a wrap-up at the end of a session, treaded discussions were also organized around each of the thematic sections of the conference. These discussion groups could explore global issues related to the sessions' themes. Participants could discuss broader issues, compare and contrast papers, and make connections with participants with similar interests.

The SEFI2001 electronic conference

Gearold Johnson, then Academic Vice President of the National Technological University and Russel C. Jones, managing partner in World Expertise LLC, designed an electronic conference that took the form of a global poster session using the Internet and the World Wide Web. The intent was to simulate electronically a traditional session in which presenters gave summaries of papers describing and analyzing projects in engineering education, and engaged in dialogue with members in attendance at the session. The hope was that such educators would use provided web locations to share 'best practices' with their peers globally, and in the process of reviewing other such submissions would continue their own professional development.

Announcements about the electronic conference began to circulate in the late spring before the conference. Submissions were posted as they were received. At the actual SEFI meeting the papers were summarized and the results presented as part of an experts' panel. The entire session was videotaped with the results to be made available globally using the same technologies as the worldwide poster session.

At the completion of the electronic conference, a summary session was held in Copenhagen. A panel of technical experts was formed to review the electronic conference activities. This group conducted a half-day session to present their summaries, and interact with one another. An audience was present, consisting of participants in the face-to-face conference to which the electronic conference was adhered. Logistics of live electronic interaction with electronic participants, and time zone constraints precluded direct live transmission.³

2003 WFEO/ASEE e-conference

The 6th World Engineering Congress on Engineering Education/2nd ASEE International Colloquium was organized jointly by the World Federation of Engineering Organizations (WFEO) and the American Society for Engineering Education (ASEE,) and held on June 20-22, 2003, in Nashville, Tennessee (USA). To expand participation and permit contributions particularly from engineering educators from developing countries unable to attend the colloquium, an electronic conference was designed under the leadership of WFEO Committee on Education and Training member Dr. Russel C. Jones (USA). The e-conference was conducted through Web-based postings of papers followed by electronic discussion of those papers over several weeks preceding the Nashville meeting. At the colloquium itself, a plenary session was held, during which time three reviewers consolidated the electronic discussion and summarized the contributions. All abstracts, papers, and discussions were in English.

The call for papers for the WFEO/ASEE e-conference resulted in 74 abstracts being submitted, representing countries as diverse as Afghanistan, South Africa, China, Nigeria, Ghana, Argentina, the United Arab Emirates, Russia, Romania, Norway, the U.K., and Lithuania. Authors whose abstracts were accepted were then invited to submit the complete paper. All told, 49 papers were accepted and posted on the website. Readers were invited to browse the papers and to contribute to threaded discussions about one or more of the contributions.

For the plenary session in Nashville, the 49 papers were divided into three groups and assigned to one of three respondents asked to read, review and comment on them. Papers on "Curriculum and Teaching" were reviewed by Dr. Bethany S. Oberst, James Madison University (USA); papers on "Trends in Engineering Education" were reviewed by Dr. Hisham Shihaby, Bahrain Society of Engineers (Bahrain); and papers on "Computer, Chemical, Electrical, Industrial and Mechanical Engineering, Computer Science and Mathematics," were reviewed by Dr. Gearold R. Johnson, Institute for Workforce

Learning (USA). Brief summaries of the reviews prepared by each of the three respondents follow here.

Curriculum and Teaching -- Five converging themes emerged from the papers in this section: Student intake into engineering programs, Issues related to the ABET 2000 a-k skills, Preparation for practice, Computers in teaching and service, and National and international forces acting on engineering education. Engineering curricula reflect local politics as well as the economy, history and geography of the country where they are offered. Engineering education has clearly become a global enterprise, reflecting transnational concerns. And electronic conferences and other communication structures to link engineering educators are greatly needed to ensure that academic preparation transcends national borders.

Trends in engineering education -- The sixteen papers reviewed by this panelist were broadly grouped along three basic themes: teaching and learning, educational issues, and the educational scene. All the papers reflected the experience of the authors who without exception were involved in teaching.

Computer, Chemical, Electrical, Industrial and Mechanical Engineering, Computer Science and Mathematics -- Papers in this category were grouped under six themes: Laboratories, Traditional Course Support, First Year Chemical Engineering Courses, Web Course Support for Problem Based Learning, Large Course Support, and A New Curriculum. Most of the reviewed papers dealt with the use of the World Wide Web to increase access as the educational improvement. However, interestingly, a couple of papers suggested that the use of the web not only increases access to the physical or simulated laboratory experiments but laboratories in a closet could actually decrease costs since laboratory spaces are usually poorly utilized over time.

All papers reviewed can be found posted on a permanent website (<http://www.asee.org/conferences/e-conference/browse.cfm>) for further reference.⁴

Summary and conclusions

A set of effective processes has been demonstrated through this pilot demonstration conference, and the results may be easily transferred to other conference sponsoring groups for inclusion in the normal conference set of activities. Thus, such conferences would become part of the general framework for many international conferences.

The convergence of computing and telecommunications has been pointed at for several decades as a changing paradigm. Yet most of the changes have been relatively simple. Certainly, the World Wide Web alters the ease of getting information and the hypertext transfer protocol is the killer application that killed client/server computing. As the globe becomes more abstract, movement of more than data and information has to occur. Global electronic communities have to be constructed. This project aims to develop a global electronic community among engineering educators and for the first time, include

as citizens, engineering educators from developing nations to share their experiences and learn from their peers.

In the not too distant future, conferences as described herein should become pervasive. Travel requirements must decrease if our global society is truly to become a sustainable environment. This project was a pilot to demonstrate that a meaningful transfer of practices can be accomplished without individuals' traveling thousands of miles to meet in a face-to-face setting.

At the session at SEFI 2001 where the electronic submissions were presented, discussion suggested that the main conference could be further enhanced if its major elements were also made available electronically afterwards – such as video recording of plenary session presentations, to be posted on a web site for viewing by interested persons who were unable to travel to the conference. Such extensions could significantly enhance the effectiveness of such major international conferences.²

Engineering has always been a major part of the development of nations and wealth creation. Building infrastructure from roads, bridges, sanitation facilities, potable water, and the development of industries from mining to high technology all require that a nation educate its own engineers. Sending bright young people abroad for education works for a while, but the process ultimately requires that these people be educated at home. In the developing world, many engineering educators have been educated abroad, return home to educate the local population, but then fall further and further behind due to the inaccessibility of state-of-the-art methods in engineering education, 'best practices' of peer instructors, etc. Maintaining networked connectivity is one way the future will provide a nation with a base of well-educated engineering graduates to fuel technical industries.

References

- 1) T.J.Siller, R.C.Jones, and G.R. Johnson, "Continuing Education for Engineering Educators in Developing Countries via Electronic Communications", Proceedings of the 8th World Conference on Continuing Engineering Education, Toronto, Canada, May 2001, International Association for Continuing Engineering Education, p 538-543
 - 2) Russel C. Jones and Bethany S. Oberst, "It's Time to Rethink Engineering Education Conferences, The Renaissance Engineer of Tomorrow, Société européenne pour la formation des ingénieurs (SEFI), Annual Meeting Proceedings, Florence, Italy, 2002
 - 3) Russel C. Jones and Bethany S. Oberst, "Use of Electronic Conferences in International Engineering Education," Proceedings of the 3rd International Conference on Microelectronics and Computer Science, Vol. II, I.M. Tiginyanu and V. Sontea, eds., Chisinau, Moldova, 2002
 - 4) Bethany S. Oberst, Gearold R. Johnson, and Hisham Shihaby, ""Report on the WFEO 6th World Congress on Engineering Education E-Conference", *Ideas*, No. 10, December 2003, World Federation of Engineering Organizations, Committee on Engineering Education, p 30-35.
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