

2006-753: INTRODUCING AN ONLINE COMMUNITY FOR CHEMICAL ENGINEERING EDUCATORS

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Introducing an Online Community for Chemical Engineering Educators

Abstract

It has often been claimed that teaching is the role of a professor for which there is the least formal preparation. A new professor will be thrown into a classroom and be expected to teach, often without any training in how to teach effectively. While there are many opportunities for preparation (National Effective Teaching Institutes, training provided by one's institution, conferences such as ASEE's Annual Conference), it is often difficult to get the sort of timely help a new faculty member might wish to have to teach a new course successfully. This paper introduces a web-based forum designed to provide just-in-time strategies for classroom effectiveness. In this scenario, experienced faculty would also benefit from the experience of others teaching similar courses.

Beyond the course teaching responsibilities, there are numerous engineering education related topics for which the ability to share and aggregate information and documents in a central virtual location would be invaluable. The Chemical Engineering Division (ChED) of the American Society for Engineering Education (ASEE) is addressing these needs by launching a virtual community for chemical engineering educators, the ChED Forum (<http://www.aseeched.org/Forum>). Faculty members worldwide will be empowered to share suggestions, comments, and resources. This knowledge is valuable but perhaps not readily disseminated by traditional conference papers and presentations; the ChED Forum would provide access to this knowledge instantaneously. Additionally, timely announcements, such as calls for papers, REU opportunities, employment opportunities, and other similar announcements will be aggregated on (or linked to from) a single website.

This paper will introduce the current design of the ChED Forum, describe its intended use, provide instruction on posting and reading from the site, and provide a vision statement for the future development of this community. Most importantly, the active participation of faculty members will be solicited to develop this Forum as dynamic community of chemical engineering educators, promising to help improve the quality of a chemical engineering education worldwide.

Introduction

As the internet becomes the primary means of disseminating information, the need to organize that information in an efficient manner becomes apparent. While a search on various index sites will provide numerous resources on chemical engineering education, finding the best resources, recommendations, and experiences that apply to specific courses is an inefficient task. As a service to its membership, the Chemical Engineering Division (ChED) of the American Society for Engineering Education (ASEE) executive committee decided in 2004 to examine ways of facilitating virtual interaction amongst new and experienced chemical engineering educators, providing a forum for sharing ideas, experiences, and resources. The most effective means of addressing these needs was clearly internet-based, but a structure which did not require consolidated management or possess a steep learning-curve to contribute was needed. An extension to the existing static web site for the division or a mailing list were considered, but rejected for various reasons. Ultimately, it was decided that a virtual message board would serve the bulk of envisioned purposes for the board.

There have been other attempts at developing online resources to aid chemical engineering educators. Perhaps the most successful to date has been the CACHE website, (<http://www.che.utexas.edu/cache>). While it does contain valuable resources, it requires central administration which in turn requires significant resources to maintain. One key consideration in developing a suitable board was to not duplicate existing resources but to enhance them in a manner that allowed broad dispersion of effort and minimal maintenance. This site should also complement the educational research-oriented discussion board of the online journal *Annals of Research on Engineering Education* (<http://www.areeonline.org>).

The message board was placed online in a testing mode in July of 2005. The initial objectives of the board were

- To facilitate communication amongst chemical engineering educators
- To provide a forum for communicating best practices in chemical engineering education to faculty
- To provide a centralized resource for chemical engineering education specific opportunities and announcements, including employment opportunities, post-doctoral openings, research experiences for undergraduates (REU) announcements, and other timely notices
- To serve as a launching point for other resources in engineering education

Other possible uses of the site are envisioned and discussed later in the paper. The site is located at <http://www.asee-ched.org/Forum>.

Definitions

There are necessarily some terms used in this paper which have particular meanings in the context of a web-based message board. Several which are important to understanding this paper are defined here.

- *Virtual Community*: Refers to those people participating through this website both contributing and receiving modes
- *Forum*: As used in this paper, refers to the whole set of discussions and other items posted on the web site; in the context of the board administration, refers to top-level groups of discussions with a common theme. This will be referred to as an “area” in this paper, and these areas are grouped for convenience.
- *Topic or Thread*: Particular discussions within a area
- *Posts*: Specific comments submitted to a topic inside an area of the forum
- *Attachment*: A file which is uploaded to be hosted by the ChED site and made available for download though the Forum
- *Link*: A clickable connection to resources hosted outside the ChED site, including hyperlinks to other websites and downloads from other websites and FTP repositories
- *Users*: Persons registered on the website and approved by the administrators. This restriction is required due to the abuse of the site by those not affiliated with chemical engineering.

Structure

The Forum website is managed by the Webmaster of the ChED with technical assistance from a contracted student employee of the Division. Day-to-day operational and management decisions are made by the Webmaster, but more substantial issues are referred to the Division leadership on the Executive Committee. The Executive Committee retains ownership of the content of the site and manages it on behalf of the Division. The Webmaster also solicits input from all members of the division, and a portion of the Forum is dedicated to suggestions for improving the site.

To reduce costs, the site is hosted by the institution affiliated with the Webmaster. An internet domain forwarding service redirects the asee-ched.org domain to the host site. This allows for transparent continuity in site availability during changes in Division leadership.

Individual top-level topics are supervised by volunteer moderators, Division members serving as moderators are asked to occasionally monitor their topic and make contributions, enhancements, and consolidations as they see necessary. Their role is both to improve the coherency of their topic by summary threads messages and to solicit new topics. Moderators can edit or delete all messages posted in their area.

The Forum includes the ability to upload and disseminate attachments. This is intended to allow electronic materials, such as a innovative laboratory assignment, to be uploaded in a compact form, such as a PDF (Portable Document Format), without the use of an intermediary website. This means that faculty who do not maintain their own websites can still disseminate materials broadly through the ChED.

The ASEE Chemical Engineering Division Forum 1.0

The first implementation of the Forum is accessible from the Forum link on the ChED website, <http://www.asee-ched.org/>, as shown in Figure 1.



Figure 1. Forum as viewed from within the ChED web site.

The Forum is organized into broad groups, which are then broken down into areas. Currently, the groups include Announcements; ChE Division; Course Discussion; Educational Research, Theory and Methods; and New Faculty.

The Announcements group is intended to serve more as a posting area than a discussion area. The areas are broken down as follows

- **Forum Announcements:** Describes changes and other updates to the Forum. This topic is open to new threads posted by moderators only, though all registered members can comment. See Forum Requests for user-initiated discussion.
- **REU Opportunities:** All users can post descriptions of research experiences for undergraduates. Posts can include a complete description to the opportunity, a link to another site, or a combination of both. Uploads of posters, e-mail links, and other resources are also permissible.

- Faculty Positions: Employment opportunities for persons with particular interests in education are welcomed. This topic is intended for faculty positions with an emphasis on undergraduate education, but the site administrators will not prohibit listings for traditional faculty positions at research institutions. Positions in Engineering Education Research are also suitable.
- Forum Requests: This is intended for user-initiated discussion about the Forum, especially requests for additional areas.

Since this is hosted by the ChED, it is appropriate to provide a place for discussions relevant to division business. Most recent areas have included discussions on proposed Bylaw revisions, breakdowns of specific responsibilities for the officers of the division, and resources intended to encourage nominations of division members for Fellow grade in the ASEE.

The third grouping serves as the core of the site. The Course Discussion group holds topics discussing what works, does not work, and what might work in chemical engineering education, broken down according to traditional course areas in chemical engineering. Currently, those course areas are: material and energy balances; thermodynamics; equilibrium staged separations; fluid mechanics; heat and mass transfer; process control; modeling and simulation; computers in the curriculum; process and plant design; safety; kinetics and reactor design; electives and emerging areas; and freshman engineering.

Educational research, theory, and methods is the fourth focus group of the site. Currently, the only active area is that of journals. The active threads in that topic are shown in Figure 2. Other areas in this section include K-12 Outreach, Recruitment, and Retention; ABET Assessment; and Conference Resources.

Journal Resources
Moderators: None
Users browsing this forum: None

[newtopic](#) [ASEE-ChED.org Forum Index -> Journal Resources](#) [Mark all topics read](#)

Topics	Replies	Author	Views	Last Post
European Journal of Engineering Education	0	Joseph Shaeiwitz	56	Mon Sep 12, 2005 11:48 am Joseph Shaeiwitz →
Global Journal of Engineering Education	0	Joseph Shaeiwitz	49	Mon Sep 12, 2005 11:47 am Joseph Shaeiwitz →
International Journal of Engineering Education	0	Joseph Shaeiwitz	58	Mon Sep 12, 2005 11:45 am Joseph Shaeiwitz →
Annals of Research on Engineering Education	0	DavidSilverstein	70	Thu Aug 18, 2005 11:07 am DavidSilverstein →
Chemical Engineering Education	0	DavidSilverstein	51	Mon Aug 08, 2005 3:06 pm DavidSilverstein →
Journal of Engineering Education	0	DavidSilverstein	44	Mon Aug 08, 2005 2:41 pm DavidSilverstein →

Display topics from previous:

[newtopic](#) [ASEE-ChED.org Forum Index -> Journal Resources](#) All times are GMT - 6 Hours

Figure 2. Threads in the journal resources topic of the Educational Research, Theory, and Methods area of the Forum. In the early stages of the board, the few active member names will be prominent.

The final group of the website as currently constructed is the section oriented toward New Faculty. Two areas have been created to facilitate discussion: “How To Survive Your First Class,” intended to be populated with the sage advice of experienced faculty; and “2007 Summer School for ChE Faculty,” which will allow discussion of this key event for preparing faculty for effective teaching.

Vision for Future

The key to success of this board will be achieving widespread participation to develop content that makes this site a valuable resource. Some additional uses of the website envisioned by the authors include:

- Serving as a host for discussions of articles in *Chemical Engineering Education*, including making author resources available for download. For example, an article containing reference to a novel Matlab solution could post a file containing those source files, instead of making them available by e-mail request.
- Serving as a repository for resources associated with conference presentations on chemical engineering education, including the ASEE conference and the AIChE Annual Meeting. For example, authors could make their presentation slides available to interested parties and enable discussion of the subject.
- Increasing the reach of the site to include chemical engineering educators worldwide. Perhaps discussion of the differences and commonalities between curricula in different countries and regions, or balance between theory and application in courses would serve as starting points for increasing interaction amongst peers in different nations.
- Facilitating communication between educators and industrial practitioners with the goal of continuous improvement of the primary “product” of the undergraduate educational process, practicing engineers.
- Possibly serving as a revenue generator for the Division by allowing limited targeted advertising on the site.
- Expansion of the site to include a user-authored and maintained encyclopedia of chemical engineering education, a “wiki”.

Technical Detail

The site is currently run using an open-source freely-licensed bulletin board software package called phpBB (<http://www.phpbb.com/>). As implied by the name, this is based on the PHP server language. It requires access to a database (we use the open-source MySQL, <http://www.mysql.com/>), and of course a web server (currently an Apache HTTP server, <http://www.apache.org/>). All of these packages can be run from a Linux, Unix, or Windows based server.

In addition to the core phpBB package, we have customized the appearance of the Forum to coordinate with the division web site (<http://www.asee-ched.org/>) using the “XeonStyle” theme by DaTutorials (<http://DaTutorials.com>). To allow for users to upload attachments to the

site, a “mod” was installed called AttachmentMod. Another “mod” was installed to prevent e-mail addresses from being displayed to non-registered users. This prevents “harvester bots” from collecting e-mail addresses from the list of registered users. Other security measures have been enabled to prevent individuals from using the Forum as a means of advertising items of questionable repute.

User Guide

There is a slight learning curve associated with using this board if you have not used similar web sites previously. There is nothing you can damage as a regular user, so feel free to experiment. The following instructions are intended to guide you through some basic functions on the Forum: registering as a user; posting messages; attaching documents; and editing previously posted documents. The FAQ link at the top of the forum will provide additional help in using the forum.

It is important that all users posting to the site register as a user. The primary reason is that in order to post anywhere except in the “Help” forum, you must be a registered user. Additionally, registering gives users the ability to contact you without having your email address. This “private messaging” allows public communication at your convenience without compromising your email address. To begin the registration process, click “Register” at the header of the forum, as highlighted in Figure 3.



Figure 3. The registration process begins by clicking the "Register" link in the header of the Forum.

The registration process requires you to acknowledge some basic disclosures about the website and to ensure you are not under age 13. If you agree, you will be asked to provide some required information, such as your username, an email address, and a password. You may optionally provide some additional identifying information, such as a website address. Perhaps more importantly, you can set some key preferences, such as whether to hide your email address from users (including registered users), and to enable notification of replies to your posts. The registration process will introduce you if you are interested to some of the advanced features of the board. Any of these selections may be changed at any time you are logged in by selecting the “Profile” link in the header of the Forum page.

Once you are registered, you will need to log in for the board using the username and password you selected. Note there may be a delay between the time you register and when you will be able to login. This is an unfortunate side effect of the “dark side” of the internet. An administrator must approve all registrations to ensure they are likely to be legitimate users of the

Forum. After that process is complete, you should ensure you are logged on before posting to the board.

Before posting to the Forum, please take a moment to consider where your post belongs, and also take advantage of the search function to see if your topic has been previously posted. For example, a post regarding the existence Journal of Engineering Education (JEE) would not require a new thread in the Journal Resources topic. A post regarding a particular (JEE) article useful to an instructor of thermodynamics, however, would be suitable for a new thread in the Thermodynamics topic of the Course Discussion area. To post a comment on an existing thread, such as the JEE resource topic, you would navigate to that topic by clicking on the area name “Journal Resources”, then clicking on the “Journal of Engineering Education” topic. You can then post a comment by clicking on the “Quote” button if you would like your reply to contain elements of a particular post, or just “Post Reply” if you wish your post to start from scratch.

The screenshot displays the 'Journal of Engineering Education' forum page. At the top, there are navigation buttons for 'newtopic' and 'postreply', and a breadcrumb trail: 'ASEE-ChED.org Forum Index -> Journal Resources'. Below this is a header bar with 'View previous topic :: View next topic'. The main content area is a table with two columns: 'Author' and 'Message'. The author is 'DavidSilverstein', Site Admin, with a bio: 'The premier archival journal for educational research in engineering-- re-invented in 2005 to focus on rigorous research.' The post is dated 'Mon Aug 08, 2005 2:41 pm' with subject 'Journal of Engineering Education'. A 'quote' button is visible. Below the post are buttons for 'profile', 'PM', and 'email'. At the bottom, there is a filter section: 'Display posts from previous: All Posts Oldest First Go'. The footer includes 'Page 1 of 1' and 'All times are GMT - 6 Hours'.

Figure 4. To add a comment to an existing topic "thread", click "Post Reply".

To start a new topic, navigate to the area of interest. In our previous example, we would post a new thread in “Thermodynamics” by clicking on the “Thermodynamics” link in the “Course Discussion” area. You would then click the “New Topic” button and enter your new thread, including a meaningful topic name.

Figure 5. Entering a new topic

Actually entering a topic is simpler than it appears. The topic of your thread should be entered in the “Subject” field. There are tools available to customize the appearance of your post and to aid in formatting your entry—these will not be covered here but are discussed in the FAQ section of the site, available from the first link in the page header. You need not worry about these options and just enter your text in the main field. You can select the “Notify me” option if you wish to have an email sent to you when someone posts on your newly created thread. Note that the reply entry form is identical to this new topic form.

Figure 6. Uploading attachments

When entering (or editing) your message you will have the option to upload an attachment. There are restrictions on the file types that can be uploaded, but those not allowed can be placed in a zip file and then uploaded. The reason for these restrictions is to prevent malicious software from being downloaded and automatically executed by your web browser.

Files that would need to be placed in a zip file include Matlab m-files, Excel spreadsheets, and video files. There are also limits to file size which should not be a problem for most files. To attach a file, click the “Browse” button to locate that file on your computer. Once that file is selected, you must click “Add Attachment” to actually upload that file to the Forum.

Before a message is actually posted, you have the opportunity to preview how your post will look before making your submission. If you post as a registered user, you can later edit the message using the same interface you used to create the message. If you are not logged in as a registered user, your message cannot be edited by anyone except the topic moderator. To edit a message previously posted as registered user, navigate to that particular message. As the author of that message, you will have an “edit” button which you may click to modify the message or the attachment.

Summary

A new resource for chemical engineering educators is now online and available at <http://www.asee-ched.edu/Forum>. The Forum is the hub of a virtual community envisioned to facilitate interaction amongst those interested in chemical engineering educations. It has a simple design, is reasonable easy to use, and allows for ready dissemination of resources in many electronic forms. Those interested in contributing are encouraged to do so, and volunteers to moderate various areas of the forum are welcome. The success of this community will depend not on technical modifications to the website, but upon the willingness of experienced educators to spend a few minutes a term to share highlights of their most recent experiences in chemical engineering education.