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http://www.foundationcoalition.org

The Foundation Coalition Newsletter

....an agent of change

*From **Jeff Froyd**, Project Director*

According to ABET, engineering graduates should be able to function effectively on multidisciplinary teams. More and more capstone design project and first-year engineering courses are using teams. Cooperative learning approaches utilize teams for all types of classes. Students are participating on more and more teams, yet are they learning to function within teams? More importantly, are faculty members learning how to help students develop their interpersonal and leadership skills? Certainly, faculty members raise many important questions about using teams: How might I form teams? How might I help teams improve? How might I assign individual grades for team assignments? To address these and other questions, Foundation Coalition faculty are constructing a series of documents. The first document, which is about forming teams, is available at http://fc1.tamu.edu/publications/brochures/2002-Mar-01_Forming_Teams.pdf. This document sets out issues to be considered in forming teams, explores these issues, and then shows how different faculty members have synthesized their answers after considering the issues. A second document on getting teams off to a good start will be available shortly. Others on peer assessment and facilitating dysfunctional teams will be released after that. Most of the documents in the series are scheduled to be finished before the 2002 ASEE Conference so that the documents can be distributed at the conference. If you have experience in using teams in your courses and would like to contribute, just contact Jeff Froyd at froyd@tamu.edu. We hope the series will be a valuable resource.

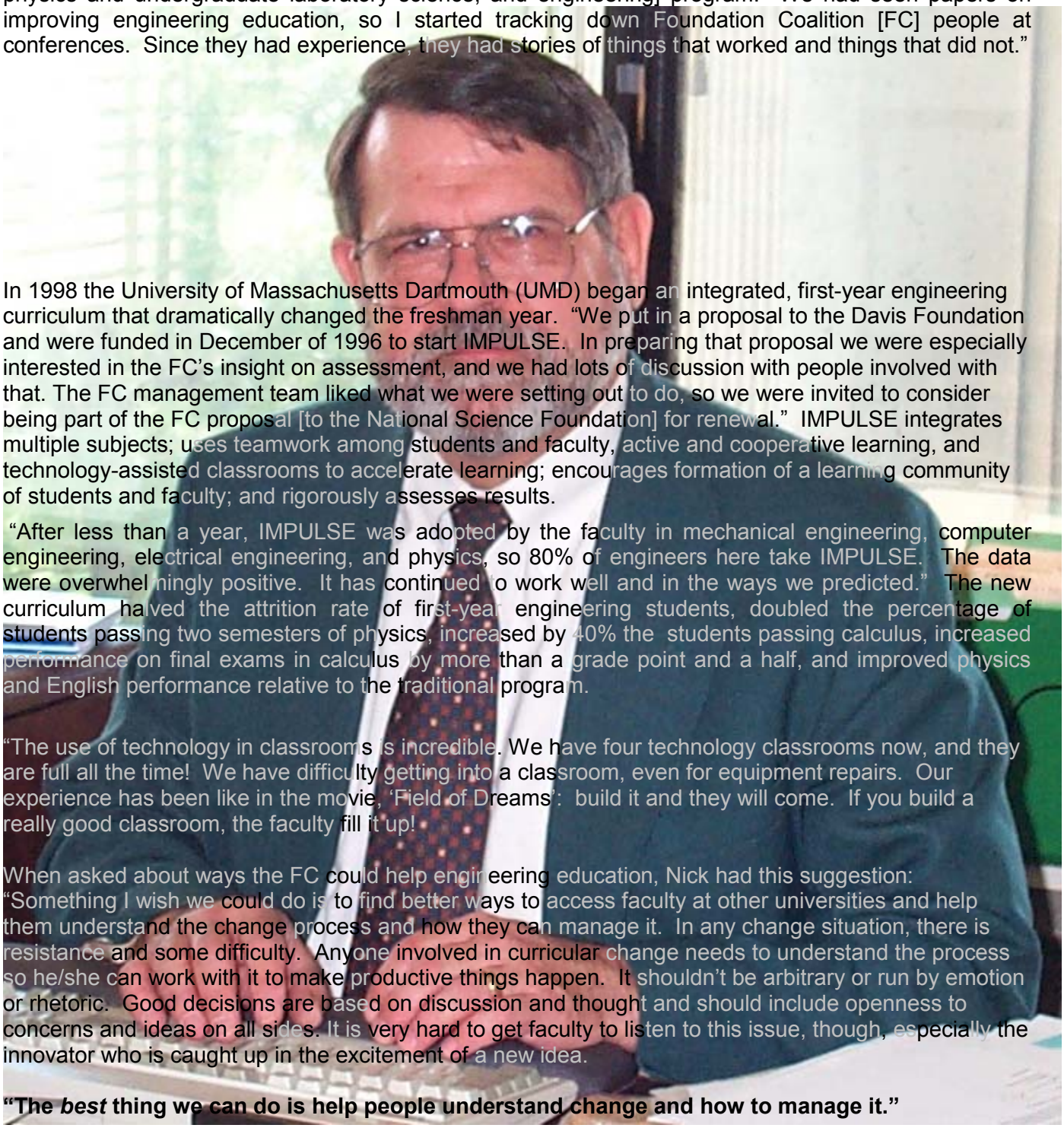
Upcoming events

May 2	A **meeting of the coalitions** will be held to discuss dissemination plans, Drexel University campus, Philadelphia PA. E-mail Tim Anderson or call 352.392.0882. Read more.
May 9–10	**Freshman Innovations Miniconference** at the University of Michigan, Ann Arbor. This FC-funded miniconference is by invitation. The contact is John Mitchell. Read more.
May 13–14	**Undergraduate Educational Issues in SEC Engineering Schools Meeting** in Nashville TN. Read more.
May 16–17	**Miniconference on the energy stem in the mechanical engineering curriculum** will focus on integration of courses across the energy curriculum and concept inventories for thermodynamics, fluid mechanics, and heat transfer. Read more.
Jun 16–19	**American Society for Engineering Education Annual Conference and Exposition** in Montréal, Québec, Canada. Read more.
Aug 11–16	**E-technologies in Engineering Education: Learning Outcomes Providing Future Possibilities** (United Engineering Foundation conference) in Davos, Switzerland. E-mail Sarah Pfatteicher. Read more.
Sep 30–Oct 1	**Engineering and Computing Education Grantees Conference** in Washington DC. E-mail Susan Kemnitzer or call 703.292.8382. Read more.
Nov 6–9	**Frontiers in Education 2002** in Boston MA. Read more.
Mar 2003	**Share the Future IV,** the cross-coalition conference, is tentatively scheduled to be held at Arizona State University in Tempe.

Nick Pendergrass

Electrical and Computer Engineering
University of Massachusetts Dartmouth

"About six years ago we were struggling to put together what became the IMPULSE [integrated math, physics and undergraduate laboratory science, and engineering] program. We had seen papers on improving engineering education, so I started tracking down Foundation Coalition [FC] people at conferences. Since they had experience, they had stories of things that worked and things that did not."



In 1998 the University of Massachusetts Dartmouth (UMD) began an integrated, first-year engineering curriculum that dramatically changed the freshman year. "We put in a proposal to the Davis Foundation and were funded in December of 1996 to start IMPULSE. In preparing that proposal we were especially interested in the FC's insight on assessment, and we had lots of discussion with people involved with that. The FC management team liked what we were setting out to do, so we were invited to consider being part of the FC proposal [to the National Science Foundation] for renewal." IMPULSE integrates multiple subjects; uses teamwork among students and faculty, active and cooperative learning, and technology-assisted classrooms to accelerate learning; encourages formation of a learning community of students and faculty; and rigorously assesses results.

"After less than a year, IMPULSE was adopted by the faculty in mechanical engineering, computer engineering, electrical engineering, and physics, so 80% of engineers here take IMPULSE. The data were overwhelmingly positive. It has continued to work well and in the ways we predicted." The new curriculum halved the attrition rate of first-year engineering students, doubled the percentage of students passing two semesters of physics, increased by 40% the students passing calculus, increased performance on final exams in calculus by more than a grade point and a half, and improved physics and English performance relative to the traditional program.

"The use of technology in classrooms is incredible. We have four technology classrooms now, and they are full all the time! We have difficulty getting into a classroom, even for equipment repairs. Our experience has been like in the movie, 'Field of Dreams': build it and they will come. If you build a really good classroom, the faculty fill it up!

When asked about ways the FC could help engineering education, Nick had this suggestion: "Something I wish we could do is to find better ways to access faculty at other universities and help them understand the change process and how they can manage it. In any change situation, there is resistance and some difficulty. Anyone involved in curricular change needs to understand the process so he/she can work with it to make productive things happen. It shouldn't be arbitrary or run by emotion or rhetoric. Good decisions are based on discussion and thought and should include openness to concerns and ideas on all sides. It is very hard to get faculty to listen to this issue, though, especially the innovator who is caught up in the excitement of a new idea.

"The *best* thing we can do is help people understand change and how to manage it."