

Work in Progress: The Mountain Did Come

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Abstract – The present paper describes how the FIE 2003 papers were employed by the Civil Engineering faculty at Centro Universitário Positivo in order to improve learning through curriculum-wide actions. Before the beginning of the 2004 academic year, each Civil Engineering Professor selected one session from the FIE 2003 proceedings, from which an overview was presented in a faculty mini-conference. During the academic year, some of the ideas discussed are being applied, with preliminary results being included at the time of writing.

Index Terms – Civil Engineering, FIE 2003, teaching, UnicenP.

INTRODUCTION

In Engineering circles, the saying “if the mountain will not come to Mohammed, Mohammed will go to the mountain” may evoke thoughts of earthmoving equipment and heavy machinery, as we, engineers, upon hearing the statement, will already have started making plans on how best to relocate the mountain. However, one question remains unanswered, which is: where to? The present paper describes how the FIE 2003 mountain was moved to Curitiba, Brazil, and what use was made of it.

MOTIVATION AND METHOD

While attending some of the FIE 2003 sessions in Boulder, last year, the first author considered how much each of his fellow faculty members of the Civil Engineering program at UnicenP could benefit from the ideas being presented. Budgetary constraints notwithstanding, it would be unfeasible to take the whole faculty to the conference. Thus, a plan started to form in order to spread the FIE words among those professors. At first, reading recommendations, e-mailed with attached conference papers were considered, which still accounted for limited exposure to the overall contents of the conference, or an excessive number of papers to be read by each person. The solution adopted was to hold a mini-conference during the pre-term faculty planning week. Each professor was asked to browse through the online FIE 2003 proceedings and then elect one session which spiked his/her interest. Acting much as a session chair, the professor would then read all the papers included in that session and present an overview to his colleagues. Besides the overview, each professor was also expected to tell the others how he/she

would apply some of the concepts or techniques described to the subjects he/she teaches. The sessions selected are listed in Table 1. An expected by-product of this endeavour is the faculty-wide adoption of many new teaching tools in the program, raising the quality level of all lectures, and helping to improve learning by the students, the focus of all efforts.

TABLE I
FIE 2003 SESSIONS SELECTED [1].

Session	Title
S1D	Knowing our Students 1
T2A	Successful Students
S4D	Student Teams
F4D	First Year Students
T4A	Approaches Inside the Classroom
S3B	Teaching Via Design
F2A	Pre-College Concepts
S3E	Undergraduate Research
T3D	Concept Inventories
T2H	Geek Party Tricks
T3F	Web-based instruction I
F2E	Laboratory Innovations
T2G	Partnering for Effective Community Outreach
T4H	Laboratory Learning and Problem Based Classroom
T2B	Assessment and Information Technology
T3E	Remote and On-Line Laboratories
S2A	Ethics
F3B	Global Issues in Engineering Education

PRELIMINARY RESULTS

Some of the ideas discussed in session T3E, Remote and On-Line Laboratories, are being applied in the course “Algorithms and Computer Programming”, where the instructor (Prof. Carlos Vasconcellos) is publishing the content of the lectures on the web, together with algorithms, their equivalent C-programs, additional examples and homework.

Session S2A, Ethics, has prompted end-of-lecture discussions in the courses “Project Management” and “Business Administration”, where the instructor (Prof. Claudio Ferreira) proposes questions for reflection and debate, which have led to heated discussions among the students.

Session S3B, Teaching Via Design, and specially the paper by Vable [2], have prompted the inclusion of photographs and illustrations of real structures in the lecture material for the course “Structural Systems I”, in which a topic was also added for the discussion of structural models and determination of loads in real structures. The course “Applied Calculus” has also benefited from the ideas presented in session S3B, where the solution of a simple engineering problem has become a laboratory activity involving both the

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use of Maple[®] and programming in C. Both courses are taught by Prof. Marcos Arndt.

The first author of the present paper made contact with Prof. Jay K. Martin [3], produced a portuguese version of the Fluid Mechanics Concept Inventory (FMCI) and applied it to two classes at the beginning of the term. The data were analyzed and shall be compared with the results obtained at the end of the term, when the students will again take the FMCI test.

Session, T2A, Successful Students, and specially the work by Streveler et al. [4], were outlined during the first class of the course “Fluid Mechanics and Hydraulics”, when the instructor (Prof. Marcos Cassias Pereira) highlighted good study habits reported in that paper. Periodically, the students are reminded of some of these habits.

CONCLUSION

At the time of writing, only a few months have elapsed since the beginning of efforts towards curriculum-wide application at UnicenP’s Civil Engineering program of FIE 2003 ideas. Nevertheless, some results have been observed, and there is even a suspicion of student performance improvement over previous years’ midterms. The most pronounced effect, however, has been the students’ perception that the faculty is willing to mix new teaching methodologies with the traditional approaches in order to improve learning.

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REFERENCES

- [1] IEEE. FIE 2003 Conference Proceedings, 2003.
- [2] Vable, M., “Enhancing Understanding of Concepts in Mechanics of Materials Using Design”, *FIE 2003 Conference Proceedings*, 2003.
- [3] Martin, J., Mitchell, J., and Newell, T., “Development of a Concept Inventory for Fluid Mechanics”, *FIE 2003 Conference Proceedings*, 2003.
- [4] Streveler, R., Hoeglund, T., and Stein, C., “The Study Strategies of Successful Students at the Colorado School of Mines”, *FIE 2003 Conference Proceedings*, 2003.