INFINITY PROJECT: A HIGH SCHOOL ENGINEERING CURRICULUM, ONE YEAR LATER

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Abstract — This work-in-progress paper presents an update to The INFINITY Project (http://www.infinity-project.org/), a joint effort between university educators, industrial partners, and high school teachers to introduce an engineering curriculum at the high school level. The initial pilot program (2000-2001) involved nearly 500 students at 14 different Texas high schools. Responses to the effort from teachers and students at the different high schools have been highly positive. The presentation will discuss the further expansion of the program into over 40 schools during the 2001-2002 school year. An overview of the project was presented at FIE 2000. This presentation will expand findings after the first year of running the project and initial findings in the second year.

Index Terms — K-12, engineering curriculum, high school, technology in education.

INTRODUCTION

The Internet, cell phones, and other fruits of engineering labor are used by millions of people in their daily lives. Many children are exposed to advanced technology at a young age but, because of modern-day pre-college curricula, many of these children will never learn about the mathematical and scientific underpinnings of our society's ubiquitous high technology.

What skills will prepare students for the challenges of a high-tech society? Clearly, basic knowledge of both mathematics and science are critical. It is our belief, however, that an understanding of how engineers use math and science in technology development is equally crucial to students' success. The best way to ensure that students gain that knowledge is to include engineering and technology as part of the core subjects in elementary and high school educations. The state of Massachusetts must agree with this since it passed a law last December requiring engineering to be taught at all K-12 levels. The INFINITY Project presents our combined efforts towards this goal.

THE INFINITY PROJECT

The goals, people involved, and labs of the INFINITY Project were presented at last year's FIE [1]. A paper has been accepted at ASEE [2] which goes into the details of the curriculum, how technology is used, teacher training, and results of the first year of implementation.

This paper gives a very high level overview of the goals of the curriculum and of the text being written. The talk will present the results of the first year pilot and initial findings of the second year implementation.

The Curriculum

The curriculum for the INFINITY Project has been designed to meet the following goals:
1. The curriculum must be teachable by existing high school educators drawn from the math or science fields.
2. The subject areas must include topics that are practical and relevant to the students as a whole.
3. Hands-on experiments, along with supporting hardware and software, must be used to engage the students.
4. The class must encourage even non-technical students (would be doctors, lawyers, etc.) to understand what's behind technology.

The Book

As in all educational pursuits, the INFINITY curriculum requires a core discipline upon which to build fundamental concepts and pedagogy. We are writing a textbook that embodies the curriculum’s goals [3] that consists of over 600 pages of text organized into twenty chapters covering nearly all aspects of multimedia and information technology.

The textbook is being rewritten for the second year of the program, based on input from the teachers who used it.

CONCLUSIONS

The Infinity Project is a curriculum development and implementation effort designed to introduce high school students to the critical thinking, principles, and excitement of engineering. This paper described the initial efforts of this two-year-old project. Further developments, as well as additional details regarding the goals, implementation, and progress of the Infinity Project, can be found at the Project web page (http://www.infinity-project.org)

REFERENCES


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