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9-30-2015

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Recommended Citation

Bonnie MacKellar, Gregory Hislop, Mihaela Sabin, and Amber Settle, Information technology and computer science programs: How do we relate?, Proceedings of the 16th Annual Conference on Information Technology Education, SIGITE'15, ACM, 2015, pp. 125–126.

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Information Technology and Computer Science Programs: How Do We Relate?

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ABSTRACT

In this panel session, the relationship between computer science programs and information technology programs at universities that house both will be explored. People outside the computing disciplines often find the distinction between these programs confusing. The panelists, who have experience with both types of program, will discuss strategies for differentiating the programs in the eyes of administrators, for advising students into the correct program, and for maintaining focus and excellence in both computer science and information technology programs.

Categories and Subject Descriptors

K.3.2 [Computer and Information Science Education]:
Computer science education; Curriculum

General Terms: Human Factors

Keywords

Information Technology education; Computing curricula

1. INTRODUCTION

The field of computer science is often seen as a young discipline, but the discipline of information technology is younger still. The first information technology programs started appearing in the 1990's, and became more prevalent in the 2000's [3]. In the early 2000's, an effort to create accreditation standards via ABET was initiated, and the ACM Model Curriculum for IT was published in 2008 [2]. Currently, 28 IT programs in the US are accredited via ABET [1].

Many universities in the US maintain both computer science and information technology programs, sometimes housed in the same department, sometimes as separate departments within a college,

and even sometimes in different colleges. Whatever the structure, there is often some confusion among students, administrators, and faculty as to how to differentiate these programs. One problem is that the term "Information Technology", when used outside academia, is an umbrella term that includes all areas of computing. Generally, in academia, computer science programs are more focused on algorithms and the process of constructing software, whereas information technology programs are more focused on the users of computing technology. The ACM IT Curriculum uses this as its definition: "Information Technology in its broadest sense encompasses all aspects of computing technology; IT, as an academic discipline, is concerned with issues relating to advocating for users and meeting their needs within an organizational and societal context through the selection, creation, application, integration and administration of computing technologies." [2]. Students do not understand this distinction, however, and often end up in the wrong program. Some advisors think that information technology is just computer science with less programming and try to route weaker students into information technology.

The participants in this panel are all from institutions that maintain both computer science and information technology programs. We will discuss our experiences, focusing on a number of questions: What is the difference in focus between IT and CS? How do we communicate this to students and colleagues? Are the students different, in terms of demographics, or preparation? Do students feel that IT is a "lesser" major? Are the outcomes, in terms of job and grad school placement, different? Through the panel discussions with the audience, we hope to better understand the relationship between computer science and information technology programs.

2. THE PANELISTS

2.1 Gregory Hislop

Drexel University has had multiple computing degree programs for many years. In 2013, Drexel created the College of Computing and Informatics (CCI) to bring many of these programs into one academic unit. At the undergraduate level, the College offers degrees in computer science, software engineering, information systems, information technology, informatics, and computing and security technology. Drexel is noted for a University-wide

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SIGITE15, September 30 – October 03, 2015, Chicago, IL
ACM 978-1-4503-3835-6/15/09.
<http://dx.doi.org/10.1145/2808006.2808014>

commitment to co-operative education. In CCI, all undergraduates complete at least one co-op, and most students are in a five year program that includes three co-ops of six months each.

Many students applying to Drexel and considering majors related to computing are only familiar with computer science, and have no real understanding of the alternatives. In fact, while they know computer science as the name of a major, most prospective students really do not understand computer science in any depth either. While a small number of students apply for the IT degree, the program has a significant number of students who become IT majors by changing from another program after starting at Drexel. Advising is important to help students find the right major, but students need time to try an initial major and learn about alternatives, including IT. CCI has implemented a first year design course sequence that includes material intended to help students understand the range of majors available in the College.

2.2 Bonnie MacKellar

At St John's University, both computer science and information technology are housed in one department along with programs in cybersecurity, networking, and healthcare informatics. Unfortunately, enrollment in information technology has seriously declined. Many students who are majoring in computer science aspire to careers focused on the use of technology within organizations rather than the traditional computer science careers focused on building software. Their career aspirations would be better supported by courses in information management, system administration, and security as it relates to the IT enterprise. Thus, we are trying to find ways to steer these students into the IT program.

Some of the issues we have encountered are: a perception among students and their parents that CS is a more "sexy" field than IT, and widespread misunderstanding of the relationship between CS and IT among administrators and advisors. Frequently, students are told that CS is a more general and comprehensive major than IT. As a result, we are in a process of redesigning our IT program to be stronger and more attractive to students who aspire to IT careers. We are also trying to strengthen the advising process to better route students into the major most suited to their career plans. Many of the questions we are asking within our department are the questions that this panel addresses.

2.3 Mihaela Sabin

University of New Hampshire (UNH) has had its CS undergraduate and graduate programs (including PhD) in the CS department in the College of Engineering and Physical Sciences (CEPS) since early 1980s. CEPS is one of the seven colleges of the University, located on the main campus in Durham, and has all its engineering majors, including CS, accredited by ABET. Simultaneously with the early years of SIGITE, when the IT academic discipline was being formalized, UNH Manchester (UNHM), the urban college of the University, created its first IT degree program at UNH in 2003. Called Computer Information Systems (CIS), this new computing major was housed in the Computing Technology department at UNHM. Despite national trends of declining enrollments in CS at that time, the CIS major has grown steadily to its current capacity of 70 majors (10% of the UNHM undergraduate enrollments). The opposite trend was happening in the CS department in CEPS. To boost enrollments, the CS department added an IT undergraduate major in 2008. Last year, the total number of undergraduate computing majors in the CS department was 274, 190 CS majors

and 84 IT majors (14% of the CEPS undergraduate enrollment). A similar situation is unfolding at UNHM, where the Computing Technology department created a second computing major last year, Computer Science and Entrepreneurship (CS&E). Combined enrollments in CIS and CS&E amount to 12% of the college undergraduate enrollments.

This configuration of two CS and IT undergraduate programs in two different colleges is the result of 1) adapting to fluctuating employment needs for computing majors - the dot com bust and offshoring phenomena vs. widening gap between computing graduates and projected computing jobs; 2) serving different student populations: commuter vs. residential, transfer students vs. high school graduates, non-traditional vs. traditional age; 3) capitalizing on internal and external resources - faculty expertise, lab infrastructure, advising, articulation agreements with community colleges, summer learning experiences for K12 students, sponsored internships and student research opportunities, and supportive and resourceful industrial advisory board. ACM/IEEE curriculum guidelines for CS and IT continue to articulate clearer distinctions between CS and IT disciplinary content and practices. Computing departments are left with the opportunity and challenge to implement those distinctions in light of the compelling circumstances of their local contexts.

2.4 Amber Settle

The College of Computing and Digital Media has 17 Master degree programs and 14 bachelor degree programs. The undergraduate degrees in (or joint with) the School of Computing include computer science, information technology, information assurance and security engineering, information systems, interactive and social media, math and computer science, and network technologies. In total there are approximately 1200 undergrads in the College of Computing and Digital Media, with 490 of them in computer science and 156 in information technology. The diversity of degree programs allows faculty and students to think broadly about computing and related fields, although advising is important in helping students navigate the many options.

There are some issues with the information technology program, both with respect to students and faculty. Most high school students considering DePaul are more familiar with CS than IT, so fewer first-year freshmen choose it as an option. In fact, 73% of IT students are transfer students whereas only 53% of CS students are transfer students. Advising is crucial for ensuring that students who would thrive in the program find it. Second, while the IT program has a strong core of faculty developing and supporting it, there remain some faculty who believe that IT is a fall-back degree for students who cannot be successful in CS. Finding ways to educate colleagues about the purpose and associated rigor in the IT program continues to be a challenge.

3. REFERENCES

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