

Assessing the Alignment of Curricula, Internships, Industry Certifications and Employer Perceptions to Job Standards

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Abstract

As part of the Florida Information Technology Career (FITC) Alliance, researchers assessed the high school-to-college pipeline and subsequent technology and computing education career pathways. Researchers examined and compared:

- curricula from participating institutions' information technology (IT), computer engineering (CE), computer science (CS), and information systems (IS) programs;
- job postings from two of the college campus career resource centers; reviewed internship posting from one university career center;
- IT industry certification standards; and
- IT employer interview data.

With these comparisons, researchers sought to document the extent to which select Florida institutions were preparing students for college and career in IT and related fields. In the study reported here, the researchers focused on the alignment between two and four-year programs and employer needs.

Table 6. Reviewed Syllabi by Institution and Program (N=245)

Institution	Program	Syllabi (n)
A	Information Technology	26
A	BA - Computer Science	29
B	Computer Science	15
B	Information Technology	15
A-B	Computer Engineering	21
B	Information Science	14
C	Computer Information Technology	31
C	Networking Systems Technology	50
C	Information Technology Management	24
C	Computer Systems Networking	20
Total		245

The researchers began by identifying academic competencies listed in the syllabi from courses at participating state colleges and universities. These competencies were drawn from the Florida Department of Education (FLDOE) Information Technology standards

for both secondary and post-secondary education; Association for Computing Machinery (ACM)/Institute of Electrical and Electronic Engineering (IEEE) computing standards for Information Technology (2008), Computer Science (2013), and Computer Engineering (2004); and ACM and Information Systems Association (IAS) standards for Information Systems (2010). The research team analyzed a total of 245 syllabi from 10 programs, as illustrated in Table 1.

The researchers used the same competencies to examine job and internship postings extracted from university career centers. After removing duplicate postings, the researchers analyzed 134 unique job postings and 82 unique internship postings. The job posting and internship analyses are depicted in Table 2.

Table 7. Job and Internship Postings by Institution and Program Area

Institution	Program Area	Job (n)	Internship (n)
A	Computer Engineering	82	30
A	Computer Science	126	73
A	Information Systems	33	17
A	Information Technology	66	48
C	Combined Networking	73	0
	Information Technology Management		
	Computer Systems Networking		
Totals		380	168

The final data set also included data from interviews with 16 IT employers. After data were recorded and transcribed, researchers coded the transcripts for employer-identified competencies. The codebook derived from the ACM/IEEE IT Body of Knowledge framework augmented with high-frequency competencies that emerged from the quantitative data. The competency frequencies from the interviews were then compared to the competencies derived from the job and internship posting analyses as well as those expressed in syllabi.

From these analyses, researchers concluded that the two-year and four-year programs under study imparted key technical competencies required by FLDOE Career and Technical Education (CTE) frameworks and ACM/IEEE IT curricula recommendations. These competencies were also required to prepare candidates to qualify for the high need IT jobs delineated by the Florida Board of Governors (BOG): Computer Network Architects, Computer Systems Analysts, Computer Programmers, Applications Software Developers, Systems Software Developers, and Graphic Designers (Florida Board of Governors, 2013).

However, the literature review, interview data analysis, regional job and internship posting analyses also suggested that applied skills such as critical thinking, problem solving, teamwork, and written and verbal communication were just as important for job success as technical skills.

Although applied skills were more difficult to detect in learning outcomes, determining the extent to which technical preparation programs foster these skills presents a fertile

area for further research. The specific role of high school programs in readying students for IT careers is also an area for additional investigation.

Keywords: STEM, technology, curricula, employers, internships, industry certifications

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