UNDERSTANDING HOW COMPUTER SCIENCE UNDERGRADUATE STUDENTS ARE DEVELOPING THEIR PROFESSIONAL IDENTITIES

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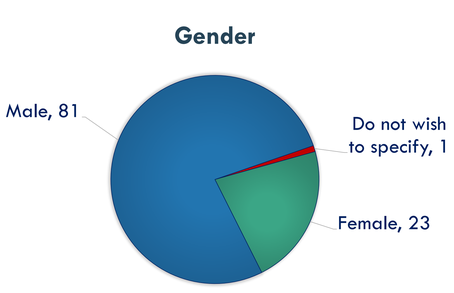
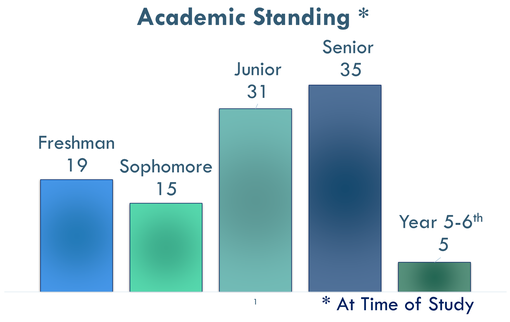
RESEARCH QUESTIONS

- How do Computer Science (CS) students identify themselves professionally?
- What skills are CS students developing within their professional identities?
- What are CS students' mechanisms and motivations for learning professional skills?
- How do male and female students differ when developing their professional identity?

PARTICIPANTS

105 CS & Computer Engineering Undergraduate Students at the University of Florida





METHODS

Survey Question Areas	Analysis Metric	Example
Professional Identity	Multiple selection question consisting of areas from the 2013 ACM CS Curricula Report and CS Industry Occupations	Software Developer, Web Developer, UX/Design
Proficiency in technical competencies	Average Proficiency Score (0-3) : None [0], Novice (0,1], Intermediate (1,2], Advanced (2,3] - Average of Self-reported proficiency for a skill set pertinent to chosen professional identity	UX : Average (Proficiency in Design Tools + Proficiency in UX Tools)
Mechanisms for developing technical competencies	Self-Reported Mechanism Score (0-3) : Used 0, 1, 2 or 3 mechanisms - None, Coursework, Research and Professional Experience	UX : Union (Mechanism for learning Design Tools, Mechanism for learning UX Tools)
Motivations for developing technical competencies	Four categories : None, Self-Interest, and Demands in the Industry. The fourth category included students who were motivated by the presence of both Self-Interest and Demands in the Industry.	UX : Union (Motivation for learning Design Tools, Motivation for learning UX Tools)

FINDINGS

Professional Identity Development

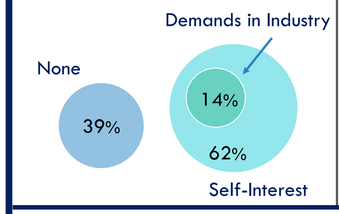
Number of Identities

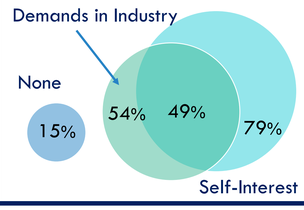
1 (43%) 2+ (57%)

Proficiency in Professional Identity

27% Novices	73% Intermediate/Advanced
Mechanisms for Learning (Coursework, Research & Internships)	
73.1% (0 or 1)	26.9% (2 or 3)
	39.9% (0 or 1)
	60.1% (2 or 3)

Motivations for Learning





Males vs Females

Identity	♂	♀
Technical Consulting	11.1%	0%
Hardware/EE	2X	X
All Other CS Professional Identities	Same	Same
Novices	25.3%	33.3% ↑
Absence of Motivation	18.6%	33.3% ↑
0-1 Mechanism	46.6%	55.4% ↑
No professional experience in the chosen Identity	49.3%	56.4% ↑

81% Software

81.5% ♂ | 78.3% ♀

Professional Identity by Academic Standing

Year 1 to Year 4 Self-Proficiency*
Novice: 100% to 11%
Intermediate/Advanced: 0% to 89%

* **Skills Assessed :** Programming Languages, Agile, and Version Control

37% Web Development

37.0% ♂ | 39.1% ♀

Professional Identity by Academic Standing

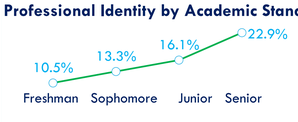
Year 1 to Year 4 Self-Proficiency*
Novice: 67% to 17%
Intermediate/Advanced: 33% to 83%

* **Skills Assessed :** Programming Languages, Agile, Version Control, HTML/CSS, and Databases

19% UX/Design

18.5% ♂ | 21.7% ♀

Professional Identity by Academic Standing



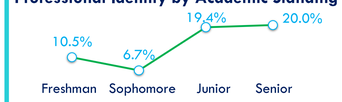
Year 1 to Year 4 Self-Proficiency*
Novice:100% to 12%
Intermediate/Advanced: 0% to 88%

* **Skills Assessed :** UX Tools, and Designing Tools

16% Hardware/EE

17.3% ♂ | 8.7% ♀

Professional Identity by Academic Standing



Year 1 to Year 4 Self-Proficiency*
Novice: 100% to 28%
Intermediate/Advanced: 0% to 72%

* **Skills assessed :** Programming Language, H/W Languages, and IoT Tools

12% Computer Security

12.3% ♂ | 13.0% ♀

Professional Identity by Academic Standing

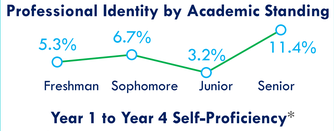
Year 1 to Year 4 Self-Proficiency*
Novice : 100% to 0%
Intermediate/Advanced: 0% to 100%

* **Skills Assessed :** Programming Languages, and Network Tools

9% Technical Consulting

11.1% ♂

Professional Identity by Academic Standing



Year 1 to Year 4 Self-Proficiency*
Novice : 100% to 0%
Intermediate/Advanced : 0% to 100%

* **Skills Assessed :** Programming Languages, Statistical Languages, Web Languages, MS Office, Agile, Version Control, and Databases

CONCLUSIONS

- Multiple motivations and mechanisms for learning distinguishes an intermediate/advanced learner from a novice learner
- CS students identify themselves generically as software professionals in the first year, and over time more students identified themselves in more specialized CS/CE professions
- As CS students begin exploring their professional identities, there is a need to ensure they have access to a various CS careers and mechanisms for exploring them