SPECIAL REPORT

ACM NDC Study:

A New Annual Study of Non-Doctoral-Granting Departments in Computing

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In winter of 2013, ACM conducted its first-ever survey of non-doctoral-granting academic departments in computing (NDC). The survey requests information on recent degrees, enrollments, faculty demographics and faculty salaries as well as gender and ethnic diversity characteristics of the faculty and students in the computing programs. It is designed to complement the Taulbee Survey of doctoral-granting departments in computing conducted by the Computing Research Association. This article reports the results of the first NDC Study, with comparisons and contrasts to data reported in the Taulbee Survey.

1. INTRODUCTION

In the winter/spring of 2013, ACM conducted the first-ever survey of non-doctoral-granting departments in computing (NDC), intended to be an annual complement to the Computing Research Association (CRA) Taulbee Survey of Ph.D.-granting departments in computing [5]. The ACM NDC Study (subsequently referred to as NDC Study) was conducted with support from ACM,[1] Google,[2] and CRA.[3] The authors of this report comprised the NDC Steering Committee. Our survey was informed by and built upon the work of the two pilot TauRUs ("Taulbee for the Rest of Us") surveys [1,4] as well as the CRA Taulbee Survey. Undertaken annually, the NDC Study will help fill in gaps in data on non-Taulbee programs to present a more complete view of the academic landscape in computing and to expand pipeline information on programs that produce candidates for Ph.D. programs as well as the private and public labor markets.

The goals of the NDC Study are to document trends in student enrollment, degree production, faculty demographics and salaries at not-for-profit U.S. academic institutions that grant bachelor's and/or master's degrees (but not Ph.D.s) in the five major computing disciplines: computer science (CS), computer engineering (CE), information systems (IS), information technology (IT), and software engineering (SE). Diversity statistics and trends with respect to students and faculty are important features of this documentation.

The NDC survey was distributed in February 2013 to qualifying programs identified using data in the Integrated Post-secondary Education Data System (IPEDS) [2]. These data are collected annually by the National Center for Education Statistics (NCES) from all U.S. institutions that participate in the federal financial aid programs [3]. There were 926 surveys distributed to academic units (departments or institutions) identified through IPEDS as offering at least one program in computing. In some cases, a single institution received multiple surveys if programs are housed in different departments within the institution. Responses were received for 93 academic units and data were reported for 191 total programs (160 bachelor's and 31 master's level). We found that 83 out of the 93 responding academic units provided data on faculty and 81 of those provided faculty salary information. We expect to increase this response rate in future years as we continue to grow awareness and NDC Study experience. The following is a preliminary summary of some key NDC Study findings. Since this is the first year of the official survey, precluding longitudinal trend analysis, data was primarily used to establish baselines and make some basic comparisons with the Taulbee Survey. Furthermore, small response sizes to some parts of the survey make it difficult to draw hard conclusions from the data provided.

In reading this report, one should consider the following points.

- We use the term "department" to refer to the unit offering the program. We use the term "program" to refer to a course of study leading to a degree in one of the computing disciplines: computer science (CS), computer engineering (CE), information systems (IS), information technology (IT), or software engineering (SE).
- A given department may offer multiple programs.
- Degree production data (master's and bachelor's) refer to the previous academic year (2011-2012).
- Data for current faculty and new students in all categories refer to the current academic year (2012-13).
- Total enrollment data (the master's and bachelor's level) are reported for both 2011-12 and 2012-13.

2. BACHELOR'S DEGREE PRODUCTION AND ENROLLMENTS

Ninety institutions completed the bachelor's portion of the survey: 29 public institutions and 61 private. Table B1 shows 88 institutions offering one or more bachelor's degrees in a computing discipline. We also found that 84 gave sufficient information to discern whether or not they offered master's degrees in computing. There were 19 institutions offering master's degrees represented and 65 that only offer bachelor's degrees. The smaller size of the master's/non-master's group should be taken into consideration when data that categorizes by institution type is presented.

The survey results include information on 160 bachelor's degrees offered by the 88 institutions. Table B2 summarizes the number of programs by discipline and the ABET accreditation status of those programs. Not surprisingly, the percentage of engineering programs that are ABET accredited (CE at 91.7% and SE at 41.7%) is much higher than for the remaining disciplines. More programs tend to be ABET accredited in public institutions than private and in those institutions that grant master's degrees.

The anticipated production of bachelor's degrees in 2012-2013 shows a double-digit increase over the number produced in the 2011-2012 academic year (Table B3). This increase is predicted to be 13.9% over all disciplines and types of institutions. By comparison, the Taulbee survey reported a 15.7% increase in degree production over the period 2010-2011 to 2011-2012 but only anticipates a 6.9% increase between 2011-12 and

[1] Particularly John White, ACM CEO.
[2] Especially Maggie Johnson, Director of Education and University Relations at Google.
[3] Especially Betsy Bizot, Director of Statistics and Evaluation.

TABLE B1. SUMMARY OF INSTITUTIONS PARTICIPATING IN THE BACHELOR'S SURVEY

	Overall		Public		Private		Master's		Non-Master's	
	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total
Yes	88	97.8%	29	100.0%	59	96.7%	19	100.0%	63	96.9%
No	2	2.2%	0	0.0%	2	3.3%	0	0.0%	2	3.1%
Totals	**90**		**29**		**61**		**19**		**65**	

TABLE B2. SUMMARY OF PROGRAM OFFERINGS

	Overall			Public			Private			Master's			Non-Master's		
	Count	% Total	%ABET	Count	% Total	%ABET	Count	% Total	%ABET	Count	% Total	%ABET	Count	% Total	% ABET
CS	108	67.5%	22.2%	35	62.5%	42.9%	73	70.2%	12.3%	27	64.3%	48.1%	75	68.8%	10.7%
CE	12	7.5%	91.7%	5	8.9%	100.0%	7	6.7%	85.7%	4	9.5%	100.0%	7	6.4%	85.7%
IS	18	11.3%	11.1%	4	7.1%	25.0%	14	13.5%	7.1%	4	9.5%	25.0%	12	11.0%	8.3%
IT	10	6.3%	20.0%	5	8.9%	20.0%	5	4.8%	20.0%	3	7.1%	66.7%	7	6.4%	0.0%
SE	12	7.5%	41.7%	7	12.5%	57.1%	5	4.8%	20.0%	4	9.5%	50.0%	8	7.3%	37.5%
Totals	**160**			**56**			**104**			**42**			**109**		

2012-13. The anticipated increase, based on the 88 institutions represented in the NDC Study, is much more pronounced at public institutions (18.1%) and those that grant master's degrees (18.9%) than at their respective counterparts (8.1% and 10.2%).

TABLE B3. DEGREE PRODUCTION AND CHANGE FROM PREVIOUS YEAR BY PROGRAM TYPE

	CS Only			All Disciplines		
	2011-2012	2012-2013	% change	2011-2012	2012-2013	% change
Public	585	661	13.0%	867	1,024	18.1%
Private	406	467	15.0%	630	681	8.1%
Master's	451	527	16.9%	692	823	18.9%
Non-Master's	483	544	12.6%	728	802	10.2%
NDC Overall	991	1,128	13.8%	1,497	1,705	13.9%
Taublee (US CS Depts)	10,901	13,055	19.8%	13,806	15,975	15.7%

Table B4 shows anticipated degree production growth by computing discipline. Computer science degree production is expected to closely align with the overall growth rate in CS (13.8%), while both IT and SE anticipate much more marked increases (50.8% and 23.2% respectively). The number of CE degrees is projected to be 9.3% lower while anticipated degree production in IS programs is flat. The validity of the numbers in these last four types of programs is questionable, however, due to the small number of programs reporting.

TABLE B4. DEGREE PRODUCTION AND CHANGE BY PROGRAM TYPE

	2011-2012	2012-2013	% change
NDC Overall	1,497	1,705	13.9%
CS	991	1,128	13.8%
CE	150	136	-9.3%
IS	135	135	0.0%
IT	122	184	50.8%
SE	99	122	23.2%

Among the 2011-2012 graduates, 16.2% were female (Table B5). This compares favorably to gender data from Taulbee institutions where 13.3% of graduates were female. IS, IT, and SE programs had significantly higher rates of female graduates (21.8%, 20.5%, and 18.2%), while CS institutions were slightly lower (15.4%) and CE programs were significantly lower (12.0%). The percentage of female graduates was higher at private and non-master's degree granting institutions for CS and IS programs but lower for the other three disciplines.

A comparison of ethnicity data between NDC and Taulbee institutions (Table B6) shows that NDC institutions have a significantly higher percentage of white/U.S. resident graduates (69.3% vs. 62.6%), more black/African American graduates (7.3% vs. 5.3%), and fewer graduates that are Asian/U.S. residents (8.1% vs. 16.7%) or multi-racial/non-Hispanic (0.4% vs. 1.4%).

Enrollment over all types of institutions and programs shows an 11.0% increase between 2011-12 and 2012-13 (Table B7). This is comparable to that reported by Taulbee institutions for the period 2010-11 through 2011-12 (10.6% for those departments that reported both years) and suggests that bachelor's level computing enrollment has continued its upward trend for another year. Enrollment growth at public and private institutions is comparable (11.1% vs. 10.6%) while that at master's degree-granting institutions is significantly higher than non-master's degree-granting institutions (14.0% vs. 7.0%).

As shown in Table B8, IT showed the highest enrollment growth (23.9%), with CS, CE, and SE being more modest and similar (11.0%, 14.6%, and 15.4% respectively). IS appears to be much more flat (1.6%) and, coupled with the flat degree production in the discipline, raises a question as to why IS does not appear to be experiencing the same type of growth as other computing disciplines at NDC institutions.

When enrollments are broken down by discipline and program type (Table B9), the number of new majors in CS and SE is a large portion of the overall CS and SE enrollment, indicating that potential growth in degree production for these programs in future years may be much higher than that already seen, particularly at public and master's degree-granting institutions. In CS, this situation is similar to that reported at Taulbee institutions.

The average number of majors per program is much lower at NDC institutions than Taulbee institutions over all disciplines as well as in CS programs. Within NDC institutions, the number of majors per program in all disciplines is much higher at public institutions than private for all disciplines. Those institutions granting master's degrees see higher numbers of majors per program for all disciplines except SE, where the averages are comparable.

TABLE B5. BACHELOR'S DEGREES AWARDED BY GENDER AND PROGRAM TYPE

	Male		Female		Total Known Gender	Gender Unknown	Grand Total
CS Overall	816	84.6%	148	15.4%	964	27	991
CS Public	510	89.0%	63	11.0%	573	12	585
CS Private	306	78.3%	85	21.7%	391	15	406
CS Master's	384	87.5%	55	12.5%	439	12	451
CS Non-Master's	384	82.1%	84	17.9%	468	15	483
CS Taulbee	9,349	87.1%	1,387	12.9%	10,736	313	11,049
CE Overall	132	88.0%	18	12.0%	150	0	150
CE Public	54	87.1%	8	12.9%	62	0	62
CE Private	78	88.6%	10	11.4%	88	0	88
CE Master's	46	88.5%	6	11.5%	52	0	52
CE Non-Master's	78	88.6%	10	11.4%	88	0	88
CE Taulbee	2,106	89.4%	250	10.6%	2,356	0	2,356
IS Overall	93	78.2%	26	21.8%	119	16	135
IS Public	41	85.4%	7	14.6%	48	12	60
IS Private	52	73.2%	19	26.8%	71	4	75
IS Master's	44	84.6%	8	15.4%	52	12	64
IS Non-Master's	43	75.4%	14	24.6%	57	4	61
IT Overall	97	79.5%	25	20.5%	122	0	122
IT Public	79	78.2%	22	21.8%	101	0	101
IT Private	18	85.7%	3	14.3%	21	0	21
IT Master's	64	77.1%	19	22.9%	83	0	83
IT Non-Master's	36	85.7%	6	14.3%	42	0	42
SE Overall	81	81.8%	18	18.2%	99	0	99
SE Public	45	76.3%	14	23.7%	59	0	59
SE Private	36	90.0%	4	10.0%	40	0	40
SE Master's	31	73.8%	11	26.2%	42	0	42
SE Non-Master's	50	87.7%	7	12.3%	57	0	57
NDC Overall	**1,219**	**83.8%**	**235**	**16.2%**	**1,454**	**43**	**1,497**
Taulbee Overall	**13,584**	**86.7%**	**2,078**	**13.3%**	**15,662**	**313**	**15,975**

TABLE B6. BACHELOR'S DEGREES AWARDED BY ETHNICITY

	US Residents							Others				
	Hispanic/ Latino	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black/ African-American	White	2 or more races, non-Hispanic	Non-Resident	Total Ethnicity, Residency Known	U.S. Residency Race Unknown	Residency Unknown	Total
NDC	92	13	99	4	89	848	5	74	1,224	93	180	1,497
	7.5%	1.1%	8.1%	0.3%	7.3%	69.3%	0.4%	6.0%				
Taulbee	6.5%	0.4%	16.7%	0.2%	5.3%	62.6%	1.4%	6.9%				

TABLE B7. COMPUTER SCIENCE ENROLLMENT CHANGE BY PROGRAM TYPE

	2011-2012		2012-2013		
	Headcount	Mean Enroll	Headcount	Mean Enroll	% Increase
Overall	6,576	60.9	7,297	67.6	11.0%
Public	4,797	137.1	5,329	152.3	11.1%
Private	1,779	24.4	1,968	27.0	10.6%
Master's granting	3,680	136.3	4,197	154.4	14.0%
Non-master's granting	2,359	31.5	2,525	33.7	7.0%
CS Taulbee	48,817	367.0	56,742	599.6	8.9%

TABLE B8. ENROLLMENT CHANGE FROM PREVIOUS YEAR BY PROGRAM TYPE

	2011-2012		2012-2013		
	Headcount	Mean Enroll	Headcount	Mean Enroll	% Increase
CS	6,576	60.9	7,297	67.6	11.0%
CE	856	71.3	981	81.8	14.6%
IS	739	41.1	751	41.7	1.6%
IT	599	59.9	742	74.2	23.9%
SE	868	72.3	1,002	83.5	15.4%

TABLE B9. 2012-2013 BACHELOR'S ENROLLMENTS BY DISCIPLINE AND PROGRAM TYPE

	Majors	New Majors	#Departments*	Avg. Majors per Dept.
CS Overall	7,297	2,085	108 (103)	67.6
CS Public	5,329	1,436	35 (34)	152.3
CS Private	1,968	649	73 (69)	27.0
CS Master's	4,197	1,088	27 (26)	155.4
CS Non-Master's	2,525	879	75 (71)	33.7
CS Taulbee	56,742	17,226	142	399.6
CE Overall	981	180	12 (12)	81.8
CE Public	597	87	5 (5)	119.4
CE Private	384	93	7 (7)	54.9
CE Master's	482	52	4 (4)	120.5
CE Non-Master's	384	93	7 (7)	54.9
IS Overall	751	198	18 (17)	41.7
IS Public	455	100	4 (4)	113.8
IS Private	296	98	14 (13)	21.1
IS Master's	351	74	4 (4)	87.8
IS Non-Master's	293	87	12 (11)	24.4
IT Overall	742	185	10 (10)	74.2
IT Public	643	165	5 (5)	128.6
IT Private	99	20	5 (5)	19.8
IT Master's	561	150	3 (3)	187.0
IT Non-Master's	181	35	7 (7)	25.9
SE Overall	1,002	337	12 (11)	83.5
SE Public	750	260	7 (7)	107.1
SE Private	252	77	5 (4)	50.4
SE Master's	357	114	4 (4)	89.3
SE Non-Master's	645	223	8 (7)	80.6
NDC Overall	10,773	2,985	160 (153)	67.3
Taulbee	67,850	20,618	174	389.9

*Numbers in parentheses are departments reporting new major information

3. MASTER'S DEGREE PRODUCTION AND ENROLLMENTS

In this year's survey, 22 institutions provided data on 31 master's level programs in computing. Of the 22 institutions, 15 were public and seven private (Tables M1-M2). The small number of participating institutions, students and programs should be taken into account when drawing conclusions from the data presented here.

TABLE M1. SUMMARY OF INSTITUTIONS PARTICIPATING IN THE MASTER'S SURVEY

	Overall		Public		Private	
	Count	% of Total	Count	% of Total	Count	% of Total
Yes	22	36.7%	15	62.5%	7	20.0%
No	38	63.3%	9	37.5%	28	80.0%
Totals	**60**		**24**		**35**	

TABLE M2. SUMMARY OF PROGRAM OFFERINGS

	Overall		Public		Private	
	Count	% of Total	Count	% of Total	Count	% of Total
CS	17	54.8%	14	70.0%	3	27.3%
CE	2	6.5%	0	0.0%	2	18.2%
IS	2	6.5%	1	5.0%	1	9.1%
IT	2	6.5%	2	10.0%	0	0.0%
SE	8	25.8%	3	15.0%	5	45.5%
Totals	**31**		**20**		**11**	

For 2012-2013, these institutions anticipate an overall 26.2% increase in the production of master's degrees over the previous year (Table M3). Notably, IT programs reported a 56.5% increase and SE programs reported a 31.1% increase, both higher than the 19.4% increase for CS. In contrast, Taulbee institutions reported an anticipated decrease in overall master's degree production for 2012-13 of 9.8% and a decrease in CS specifically of 10.3%.

TABLE M3. DEGREE PRODUCTION CHANGE BY PROGRAM TYPE

	2011-2012	2011-2012 Per Program	2012-2013	2012-2013 Per Program	% change
NDC Overall	401	12.9	506	16.3	26.2%
CS	242	14.2	289	17	19.4%
CE	9	4.5	9	4.5	0.0%
IS	5	2.5	6	3	20.0%
IT	46	23	72	36	56.5%
SE	99	12.4	130	16.2	31.3%

Among the 2011-2012 master's degree graduates, 29.1% were female (Table M4), tracking closely with Taulbee numbers, where 28.7% of the master's degree graduates were female. CS, the discipline with the largest response size, reported 36.2% female graduates, significantly higher than the 22.6% reported by Taulbee CS master's level programs. (One possible explanation for higher numbers of women in NDC programs compared to those in Taulbee programs is that NDC departments have a greater percentage of female faculty members than do the Taulbee departments, as will be discussed in the next section.)

A comparison of ethnicity data between NDC and Taulbee institutions (Table M5) shows that NDC institutions have a higher percentage of Asian U.S. resident graduates (13.4% vs. 8%) and black/African-American resident graduates (7.9% vs. 2.7%). There were fewer non-resident (49.9% vs. 53.8%), white (27.1% vs. 32.2%), and Hispanic (1.1% vs. 2.5%) graduates.

Overall enrollment at NDC master's level programs increased 14.9% from 2011-2012 to 2012-2013 (Table M6). The largest increases were in CS (17.2%) and IT (24.8%), while SE saw 7.1% growth and 11.5% in IS. In CE there was a 9.5% *decline*.

4. FACULTY DEMOGRAPHICS

Table F1 shows the average size of faculty in the responding departments, broken down by type of faculty. On average, there are 8.1 faculty members (accounting for an average of 6.5 FTE) per department, of whom 5.0 (4.9 FTE) are tenure-track, 0.2 (0.2 FTE) visiting, 0.7 (0.7 FTE) full-time non-tenure-track, and 2.2 (0.8 FTE) part-time/adjunct. Private universities and departments having no master's level programs tend to have a somewhat greater percentage of tenure-track faculty and visiting faculty, but a smaller percentage of full-time non-tenure-track faculty members than do public universities and departments having master's level programs.

Full professors and associate professors account for about the same percentage of the total tenure-track faculty members (a little more than 33% each), while assistant professors make up about 25% of the total faculty (Table F2). These percentages do not vary much between public and private universities, nor between departments having master's level programs and those not having master's level programs.

There are about three times as many men as there are women among tenure-track faculty (Table F3) in the reporting NDC institutions. However, the more junior the faculty rank, the greater the percentage who are women. At each rank, the percentage of tenure-track faculty members who are women exceeds its counterpart among doctoral granting computing departments as reported in the Taulbee Survey. The percentage of women among assistant professors (which comprise most of the newly hired faculty) at the reporting NDC departments exceeds both the percentage of female students graduating from bachelor's programs in these departments and the percentage of female graduates from their master's level programs.

Table F4 shows the breakdown of tenure-track faculty members by ethnicity. White and Asian ethnicities account for more than 80% of the full and associate professor ranks and over 75% of the assistant professor rank, and more than 80% overall. Collectively, the underrepresented minority categories of African-

TABLE M4. MASTER'S DEGREES AWARDED BY GENDER AND PROGRAM TYPE

	Male		Female		Total Known Gender	Gender Unknown	Grand Total
CS Overall	146	63.8%	83	36.2%	229	13	242
CS Public	108	62.8%	64	37.2%	172	13	185
CS Private	38	66.7%	19	33.3%	57	0	57
CS Taulbee	5,645	77.4%	1,644	22.6%	7,289	173	7,462
CE Overall	8	88.9%	1	11.1%	9	0	9
CE Public	0	0.0%	0	0.0%	0	0	0
CE Private	8	88.9%	1	11.1%	9	0	9
CE Taulbee	682	89.4%	196	10.6%	878	0	878
IS Overall	3	60.0%	2	40.0%	5	0	5
IS Public	2	66.7%	1	33.3%	3	0	3
IS Private	1	50.0%	1	50.0%	2	0	2
IT Overall	35	76.1%	11	23.9%	46	0	46
IT Public	35	76.1%	11	23.9%	46	0	46
IT Private	0	0.0%	0	0.0%	0	0	0
SE Overall	81	84.4%	15	15.6%	96	3	99
SE Public	48	84.2%	9	15.8%	57	3	60
SE Private	33	84.6%	6	15.4%	39	0	39
NDC Overall	**273**	**70.9%**	**112**	**29.1%**	**385**	**16**	**401**
Taulbee Overall	**7,379**	**71.3%**	**2,966**	**28.7%**	**10,345**	**173**	**10,518**

TABLE M5. MASTER'S DEGREES AWARDED BY ETHNICITY

	US Residents							Others				
	Hispanic/ Latino	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black/ African-American	White	2 or more races, non-Hispanic	Non-Resident	Total Ethnicity, Residency Known	U.S. Residency Race Unknown	Residency Unknown	Total
NDC	4	0	49	0	29	99	2	182	365	6	30	401
	1.1%	0.0%	13.4%	0.0%	7.9%	27.1%	0.5%	49.9%				
Taulbee	237	20	749	9	253	3,030	48	5,064	9,410			
	2.5%	0.2%	8.0%	0.1%	2.7%	32.2%	0.5%	53.8%				

TABLE M6. ENROLLMENT CHANGE FROM PREVIOUS YEAR BY PROGRAM TYPE

	2011-2012		2012-2013		
	Headcount	Mean Enroll	Headcount	Mean Enroll	% Increase
CS	778	45.8	912	53.7	17.2%
CE	21	12.5	19	9.5	-9.5%
IS	26	13.0	29	14.5	11.5%
IT	157	78.5	196	98.0	24.8%
SE	351	43.9	376	47.0	7.1%
NDC Total	**1,333**	**38.7**	**1,532**	**44.5**	**14.9%**

TABLE F1. ACTUAL FACULTY SIZE 2012-13

Faculty Type	Overall Avg HC	Overall % of HC total	Overall Avg FTE	Overall % of FTE Total	Public FTE %	Private FTE %	UG only FTE %	UG+grad FTE %
# respondents	82	82	81	81	25	56	60	19
Tenure-track	5.0	74.1%	4.9	80.0%	74.6%	82.4%	81.7%	73.9%
Visiting	0.2	2.6%	0.2	2.9%	0.4%	4.1%	3.8%	0.5%
FT Non-TT	0.7	7.4%	0.7	8.6%	16.9%	4.9%	6.4%	15.5%
PT/Adjunct	2.2	16.0%	0.8	8.5%	8.1%	8.7%	8.0%	10.1%
Total	**8.1**		**6.5**					

TABLE F2. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY RANK

Faculty Rank	Overall	Overall %	Public %	Private %	UG only %	UG+grad %
# respondents	81	81	24	57	60	19
	Tot Avg					
Full Professor	154 1.9	37.3%	37.5%	37.1%	38.6%	36.4%
Associate Professor	155 1.9	37.5%	35.9%	38.9%	39.1%	35.3%
Assistant Professor	98 1.2	23.7%	25.0%	22.6%	20.9%	26.6%
Other	6 0.1	1.5%	1.6%	1.4%	1.4%	1.6%

TABLE F3. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY GENDER

Gender	Full Prof	Assoc Prof	Asst Prof	Other T-T	Overall T-T
Total faculty	154	155	98	6	413
Male	83.1%	72.2%	68.4%	66.7%	75.3%
Female	16.9%	27.1%	31.6%	33.3%	24.5%
Not reported	0.0%	0.6%	0.0%	0.0%	0.2%
percent female *	16.9%	27.3%	31.6%	33.3%	24.5%
2012 Taulbee % female*	13.5%	19.5%	26.0%	na	17.8%

* as percentage of those for whom gender was reported

American, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Hispanic/Latino, and Multiracial account for only 6.7% of the total. However, this is better than the 5.0% reported by the Taulbee Survey for doctoral granting computing departments, though the doctoral granting departments do somewhat better than the NDC departments at the assistant professor level. The percentage of assistant professors from these underrepresented minority categories is somewhat lower than the percentage of graduates from master's level programs at the NDC departments, and much lower than the percentage of graduates from their bachelor's programs.

Table F5 summarizes faculty recruiting at the 83 responding departments. On average, there were 0.48 tenure-track openings per department, or one tenure-track opening for about every two institutions during the 2011-12 recruiting year (though some institutions had more than one opening). Of these, 83% were filled. The vast majority of the new tenure-track positions were at the assistant professor level, as is to be expected. Close to one third of these new positions (30.3%) were filled by women, but only 3% from underrepresented minority ethnicities (Table F6). It appears that the departments in the NDC Study did better at recruiting women but not as well at recruiting underrepresented minorities than did their counterpart doctoral-granting departments reporting to the Taulbee Survey. However, the small number (33) of faculty recruited by the reporting NDC departments makes it inappropriate to draw strong conclusions.

The NDC survey asked the departments about the degrees required for hiring new faculty members at each rank, and for promotion and tenure decisions. The results are in Table F7. Doctoral degrees are almost universally required for hiring at the associate professor or full professor level. Even at the assistant professor level, over 80% of the 83 responding departments required the doctoral degree; this did not vary much between public and private institutions, nor between departments that offered both undergraduate and master's degrees and those that only offered undergraduate degrees. For full-time non-tenure-track positions, the master's degree is the predominant requirement. The doctorate was also almost universally required for promotion and tenure, though there were instances where a institution had a slightly weaker requirement for promotion to the rank than they had for hiring into that rank. At these institutions, once a person was at the university (and presumably met

TABLE F4. TENURE-TRACK FACULTY HEADCOUNT BREAKDOWN BY ETHNICITY

Ethnicity	Full Prof	Assoc Prof	Asst Prof	Other T-T	Overall
Total faculty	154	155	98	6	413
Nonresident Alien	0.0%	0.0%	7.1%	16.7%	1.9%
American Indian/Alaska Native	0.0%	0.0%	0.0%	0.0%	0.0%
Asian	13.0%	21.9%	25.5%	0.0%	19.1%
Black or African-American	3.9%	2.6%	1.0%	0.0%	2.7%
Native Hawaiian/Pacific Islander	0.0%	0.6%	1.0%	0.0%	0.5%
White	74.0%	62.6%	51.0%	33.3%	63.7%
Multiracial, not Hispanic/Latino	0.0%	1.3%	1.0%	0.0%	0.7%
Hispanic/Latino, any race	1.3%	3.2%	4.1%	0.0%	2.7%
Resident, race/ethnicity unknown	5.8%	6.5%	7.1%	50.0%	7.0%
Total Residency known	98.1%	98.7%	98.0%	100.0%	98.3%
Residency unknown	1.9%	1.3%	2.0%	0.0%	1.7%
Black+Hisp+NatAm+NatHaw+Multi*	5.3%	7.8%	7.3%	0.0%	6.7%
2012 Taulbee Survey*	3.2%	5.6%	8.5%	na	5.0%

* as percentage of those for whom residency is known

TABLE F5. FACULTY RECRUITING DURING 2011-12 (83 RESPONDENTS)

Faculty type	Number Sought	Avg/Dept	Number Filled	Success Rate
Tenure-track	40	0.48	33	83%
Full Professor			1	
Associate Professor			5	
Assistant Professor			27	
Visiting	11	0.13	9	82%
FT Non-TT	11	0.13	11	100%
PT/Adjunct	67	0.81	67	100%

TABLE F6. GENDER AND ETHNICITY OF NEWLY HIRED FACULTY

Gender	Ten-track
Male	69.7%
Female	30.3%
2012 Taulbee Survey*	22.4%
Ethnicity	**Ten-track**
Nonresident Alien	9.1%
American Indian/Alaska Native	0.0%
Asian	39.4%
Black or African-American	0.0%
Native Hawaiian/Pacific Islander	0.0%
White	42.4%
Multiracial, not Hispanic/Latino	0.0%
Hispanic/Latino, any race	3.0%
Resident, race/ethnicity unknown	6.1%
Total Residency known	100.0%
Residency unknown	0.0%
Black+Hisp+NatAm+NatHaw+Multi**	3.0%
2012 Taulbee Survey**	8.3%

*percent female among those for whom gender was reported

** as percentage of those for whom residency is known

the degree requirements for hiring), and performed at a level expected for promotion, the candidate's highest degree apparently was not deemed an essential ingredient in evaluating their qualifications for advancement.

The 83 responding departments reported a total of 29 tenure-track faculty departures during the past academic year (Table F8). That represents an attrition rate of approximately 7% of their total tenure-track faculty. The top three reasons for departures were retirement, leaving for a non-academic position, and leaving for another academic position. The Taulbee Survey also had the same three top reasons. However, the NDC faculty members were more likely to leave for a non-academic position, while Taulbee faculty members were more likely to leave for another academic position.

5. FACULTY SALARIES

Fifty-nine of the responding departments reported individual salaries for their tenure-track and full-time non-tenure-track faculty members. Another 18 departments reported only aggregate salaries for their faculty at the different faculty ranks.

Table F9 shows the median salaries by faculty rank among the faculty in those departments that reported individual salaries. Median salaries at the public universities exceed those at the private universities at each tenure-track rank, but not for full-time non-tenure-track faculty. Median salaries at departments that have master's level programs exceed those at departments that do not have master's level programs for all tenure-track ranks and for full-time non-tenure-track faculty.

TABLE F7. DEGREE REQUIRED FOR FACULTY PERSONNEL DECISIONS

Required degree	Hiring Full Prof	Hiring Assoc Prof	Hiring Asst Prof	Hiring FT Non-TT	Tenure	Promotion to Full Prof	Promotion to Assoc Prof
Overall (83 departments)							
Doctoral	98.8%	97.6%	85.5%	22.9%	92.8%	96.4%	92.8%
Masters	1.2%	2.4%	14.5%	73.5%	7.2%	3.6%	7.2%
Bachelors	0.0%	0.0%	0.0%	3.6%	0.0%	0.0%	0.0%
Public (25 departments)							
Doctoral	100.0%	100.0%	88.0%	16.0%	92.0%	100.0%	96.0%
Masters	0.0%	0.0%	12.0%	84.0%	8.0%	0.0%	4.0%
Bachelors	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Private (58 departments)							
Doctoral	98.3%	96.6%	84.5%	25.9%	93.1%	94.8%	91.4%
Masters	1.7%	3.4%	15.5%	69.0%	6.9%	5.2%	8.6%
Bachelors	0.0%	0.0%	0.0%	5.2%	0.0%	0.0%	0.0%
UG only (62 departments)							
Doctoral	98.4%	96.8%	83.9%	25.8%	93.5%	95.2%	90.3%
Masters	1.6%	3.2%	16.1%	69.4%	6.5%	4.8%	9.7%
Bachelors	0.0%	0.0%	0.0%	4.8%	0.0%	0.0%	0.0%
UG and Master's (19 departments)							
Doctoral	100.0%	100.0%	89.5%	15.8%	94.7%	100.0%	100.0%
Masters	0.0%	0.0%	10.5%	84.2%	5.3%	0.0%	0.0%
Bachelors	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

TABLE F8. TENURE-TRACK FACULTY DEPARTURES

	NDC	Taulbee
Responding departments	83	
Total number of departures	29	221
Reason for Departure (percent)		
Retired	39.5%	40.3%
Deceased	0.0%	4.1%
Other ac position	15.8%	28.1%
Non-ac position	29.0%	12.2%
Changed to PT	0.0%	5.0%
Other reason	10.5%	8.6%
Reason unknown	5.3%	1.8%

Table F10 shows the corresponding information for departments that reported aggregate salaries. The salary entries are the averages of the various median salaries at each rank as reported by these departments, so these are neither true median salaries nor true average salaries. Among these programs, these median averages were higher at private departments than at public departments, the opposite of the data reported above for the departments that provided individual salaries. Median averages were higher for those departments that had master's level programs than they were for departments that did not have master's level programs. This comparison is the same as that for the departments that provided individual salaries. It may be tempting to assert that the tenure-track salaries at those departments that reported aggregate salaries typically were lower than those at departments that reported individual salaries, as almost all of the tenure-track salary entries in Table F9 are less than their corresponding values in Table F8. Such an assertion would be invalid, however, based on the manner in which the aggregate salary entries are computed.

6. CONCLUSION

Although it is difficult to perform trend analysis and draw out hard conclusions from this first study, the data gathered generally confirms that positive trends in enrollment and in degree production extends beyond Taulbee institutions to the many institutions responding to the NDC survey. In addition to valuable pipeline data, the results of the NDC Study also give the computing education community a previously unavailable snapshot of the students and faculty at these institutions, which themselves annually produce thousands of graduates in the computing disciplines.

If your program participated in the 2012-2013 ACM NDC Study, thank you for your help. The 2013-2014 survey will go out to qualifying programs in the fall of 2013. We would love to hear from you about how the survey can be improved, and look forward to your continued annual participation. If you are at a qualifying program but were not able to participate, or were never contacted, we want to hear from you as well. Please send all comments and queries to Yan Timanovsky, ACM Education Manager at yan.timanovsky@acm.org. **Ir**

TABLE F9. MEDIAN FACULTY SALARIES (FROM INDIVIDUAL SALARY DATA)

	Overall	Public	Private	UG only	UG+Grad
Departments responding	59	21	38	43	15
Full professor					
Number of individual faculty	110	58	52	57	52
Median salary	$97,783	$102,000	$88,000	$88,000	$104,880
Associate professor					
Number of individual faculty	118	53	65	68	49
Median salary	$89,000	$91,000	$84,374	$78,000	$93,385
Assistant professor					
Number of individual faculty	71	42	29	32	39
Median salary	$76,000	$78,036	$71,400	$70,000	$78,036
Full-time non-tenure-track faculty					
Number of individual faculty	54	32	22	23	29
Median salary	$53,000	$52,000	$57,000	$49,000	$54,000

TABLE F10. FACULTY SALARIES (FROM AGGREGATE SALARY DATA)

	Overall	Public	Private	UG Only	UG+grad
Full professor					
Departments responding	18	4	14	13	4
Average of median salary	$94,024	$84,291	$96,805	$87,663	$108,202
Associate professor					
Departments responding	18	4	14	14	3
Average of median salary	$75,152	$68,517	$77,048	$71,462	$85,756
Assistant professor					
Departments responding	18	4	14	13	4
Average of median salary	$67,133	$63,375	$68,206	$63,300	$74,497
Full-time non-tenure-track faculty					
Departments responding	9	3	6	5	3
Average of median salary	$65,005	$47,067	$73,974	$68,184	$60,375

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