Recommendations/learning outcomes for Master's degree programs in statistics: report of ASA workgroup

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Abstract

A workgroup was formed by Bob Rodriguez, 2012 ASA President, to address the following charge:

Develop guidelines, framed as learning outcomes, for master's degree programs in statistics and biostatistics that are responsive to the needs of stakeholders who employ such graduates.

We conducted a survey of recent Master's graduates and a separate survey of employers of Master's graduates. In this poster, we present: background and description of the study process; recent Graduates responses; employer responses; and learning outcomes suggested by this process. These outcomes included: 1) a solid foundation in statistical theory and methods; 2) Programming skills; 3) Communication skills; 4: Collaboration, teamwork, and leadership development should be part of graduate education; 5) encounter non-routine, real problems throughout their graduate education. 6) internships, co-ops or other significant immersive work experiences; and 7) periodically survey recent graduates and employers to evaluate the success of programs.

Methods – Steps + Timeline

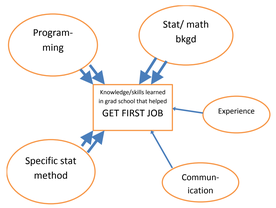
1. Constructed survey forms and submitted them for review by the ASA Survey Committee (Fall 2011)
2. Compiled list of recent graduates from contacting ASA Caucus of Academic Reps and other schools not covered by the Caucus (Fall 2011)
3. Sample of recent graduates selected and contacted for phone survey (Spring 2012)
4. List of employers compiled from solicitation from ASA Board of Directors, Caucus of Academic Reps and other contacts (Summer 2012)
5. Employer survey emailed with reminder sent two weeks later (Fall 2012)
6. Results compiled, report produced and disseminated (late Fall 2012)

Results – Recent grads

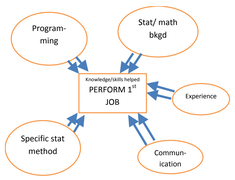
1. Names of 366 graduates provided by 21 schools
2. Number of graduates/school ranged from 1 to 110 (M=12, Q1=7, Q3=17)
3. Interviews were completed for 29 recent graduates from the 115+ contacted from 13 different schools
4. Responses to interview questions were grouped into common topic categories

Results – Recent Grads (n=29)

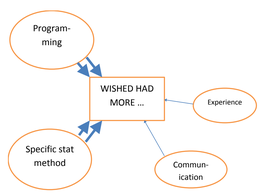
Knowledge/Skills learned in school that helped you perform your first job?



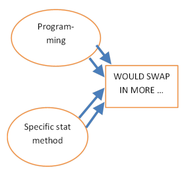
Knowledge/Skills that helped you perform your first job?



Knowledge/skills graduates wished they had more in school



Swapping courses in grad programs



Results – Employers

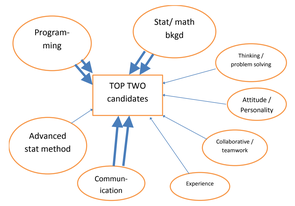
1. Names and contacted information for 68 employers of Master's graduates were generated.
2. Responses for 19 employers (28%) were generated from an email contact with a follow-up reminder two weeks later.
3. Note: two employers responded with a general email that did not explicitly address specific questions.

Results – Employers (continued)

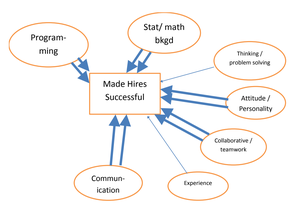
4. Employer organizations: university-based collaborative study centers/academic medical research settings (5), federal government (3), contract research organizations (2), survey organiz. (2), and financial/banking (2). Remaining organizations (each 1) : clinical trials consulting, pharmaceutical, public policy non-profit, consumer products, clinical research organization, or manufacturing. .
5. Responses to interview questions were grouped into common topic categories (dark, double arrows => more than 10 respondents mentioned this topic; single arrows => 3-8 respondents)

Results – Employers (n=19)

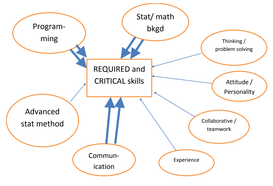
Characteristics of the top two candidates



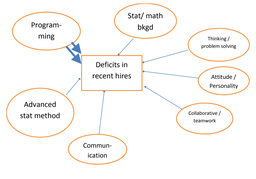
What made hires successful?



What knowledge/ skills were required and critical?



Deficits in recent hires?



Recommendations

1: Graduates should have a solid foundation in statistical theory and methods.

2: Programming skills are critical and should be infused throughout the graduate student experience.

3: Communication skills are critical and should be developed and practiced throughout graduate programs.

4: Collaboration, teamwork, and leadership development should be part of graduate education.

5: Students should encounter non-routine, real problems throughout their graduate education.

6: Internships, co-ops or other significant immersive work experiences should be integrated into graduate education.

7: Programs should be encouraged to periodically survey recent graduates AND employers of their recent graduates. Evaluate success of their programs and to examine if other programmatic changes are warranted.

Citations

Report: http://www.amstat.org/education/pdfs/PMSSS.pdf

Project INGenIOuS strategies for advancing the mathematics and statistics workforce
http://www.ingeniousmathstat.org/

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