The Importance of Quantitative Skill Sets Across Business Functions: An Appraisal of Employer

Expectations Versus Curriculum Emphasis in Schools of Business in the United States.

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WEB APPENDIX

Alumni Career Demographics (multiple selections allowed)

Career in the past ten years	Number	Percentage
1. Finance or Insurance	121	38%
2. Hospitality	18	5%
3. Government	14	4%
4. Health Care	25	8%
5. Information Services	14	4%
6. Manufacturing	26	8%
7. Real Estate	14	4%
8. Social Services	5	1%
9. Transportation	9	2%
10. Other (See Appendix)	66	21%

Table 1

Alumni Business Function Demographics (overlapping allowed)

Business Function in the last decade	Number	Percentage
Accounting	69	17%
Finance	83	20%
Information Services	18	4%
Management	74	18%
Marketing	87	21%
Sales	73	18%

Table 2

Students by Year and Major

	Sophomore	Junior	Senior
Accounting	9	8	9
Finance	5	7	12
Management	6	7	9
Marketing	7	21	16

Table 3

Accounting alumni quantitative skill frequency-of-use proportion

Quantitative Skill	Rarely	Sometimes	Most of the time	Always
Budgeting/Cost Analysis	0.05	0.19	0.24	0.52
Cash Flow Analysis	0.06	0.24	0.31	0.39
Capital Investment Analysis	0.18	0.29	0.29	0.24
Demand Management	0.23	0.44	0.21	0.12
Financial Accounting	0.00	0.09	0.31	0.60
Forecasting	0.05	0.13	0.37	0.45
Logistics Analysis/Planning	0.08	0.31	0.31	0.30
Project Evaluation	0.03	0.34	0.39	0.24
Project Management	0.03	0.21	0.52	0.24
Quality Management	0.10	0.35	0.31	0.24
Statistical Process Control	0.21	0.48	0.21	0.10
Stakeholder/Market Surveys	0.42	0.32	0.18	0.08

Table 4

Finance alumni quantitative skill frequency-of-use proportion

Quantitative Skill	Rarely	Sometimes	Most of the time	Always
Budgeting/Cost Analysis	0.07	0.21	0.25	0.47
Cash Flow Analysis	0.11	0.19	0.26	0.44
Capital Investment Analysis	0.15	0.30	0.33	0.22
Demand Management	0.23	0.37	0.21	0.19
Financial Accounting	0.07	0.19	0.27	0.47
Forecasting	0.01	0.15	0.35	0.49
Logistics Analysis/Planning	0.11	0.38	0.21	0.30
Project Evaluation	0.04	0.40	0.42	0.24
Project Management	0.10	0.23	0.42	0.25
Quality Management	0.16	0.36	0.22	0.26
Statistical Process Control	0.26	0.38	0.26	0.10
Stakeholder/Market Surveys	0.45	0.27	0.21	0.07

Table 5

Management alumni quantitative skill frequency-of-use proportion

Quantitative Skill	Rarely	Sometimes	Most of the time	Always
Budgeting/Cost Analysis	0.04	0.23	0.18	0.55
Cash Flow Analysis	0.17	0.28	0.27	0.28
Capital Investment Analysis	0.21	0.32	0.29	0.28
Demand Management	0.18	0.28	0.30	0.24
Financial Accounting	0.14	0.28	0.27	0.31
Forecasting	0.04	0.07	0.43	0.46
Logistics Analysis/Planning	0.07	0.17	0.34	0.42
Project Evaluation	0.03	0.15	0.51	0.31
Project Management	0.01	0.13	0.34	0.52
Quality Management	0.08	0.21	0.33	0.38
Statistical Process Control	0.18	0.39	0.32	0.11
Stakeholder/Market Surveys	0.30	0.31	0.26	0.13

Table 6

Marketing alumni quantitative skill frequency-of-use proportion

Quantitative Skill	Rarely	Sometimes	Most of the time	Always
Budgeting/Cost Analysis	0.04	0.21	0.16	0.59
Cash Flow Analysis	0.29	0.26	0.19	0.26
Capital Investment Analysis	0.37	0.22	0.27	0.14
Demand Management	0.19	0.23	0.33	0.25
Financial Accounting	0.22	0.30	0.25	0.23
Forecasting	0.08	0.18	0.34	0.40
Logistics Analysis/Planning	0.07	0.22	0.30	0.41
Project Evaluation	0.03	0.14	0.52	0.31
Project Management	0.07	0.08	0.27	0.58
Quality Management	0.14	0.21	0.32	0.33
Statistical Process Control	0.41	0.30	0.25	0.04
Stakeholder/Market Surveys	0.30	0.36	0.27	0.07

Table 7

Proportion of Accounting Department courses teaching QSCs

Program	Accounting_QSC	Finance_QSC	Management_QSC	Marketing_QSC
Babson	0.37	0.33	0.20	0.10
Bentley	0.45	0.39	0.15	0.01
Boston College	0.47	0.42	0.05	0.06
Boston University	0.50	0.44	0.01	0.05
Fordham University	0.41	0.31	0.24	0.04
Georgetown University	0.36	0.41	0.16	0.07
Illinois (Urbana)	0.35	0.34	0.19	0.12
John Carroll University	0.51	0.32	0.15	0.02
Miami University	0.44	0.38	0.17	0.01
Notre Dame (University)	0.51	0.40	0.07	0.02
Pennsylvania (University)	0.43	0.50	0.02	0.05
Providence College	0.47	0.33	0.08	0.12
University of Richmond	0.50	0.42	0.04	0.04
William and Mary	0.49	0.44	0.02	0.05
Wisconsin (Madison)	0.51	0.43	0.04	0.02

Table 8

Proportion of Finance Department courses teaching QSCs

Program	Accounting_QSC	Finance_QSC	Management_QSC	Marketing_QSC
Babson	0.29	0.42	0.15	0.14
Bentley	0.32	0.46	0.09	0.13
Boston College	0.35	0.55	0.04	0.06
Boston University	0.30	0.54	0.05	0.11
Fordham University	0.25	0.59	0.05	0.11
Georgetown University	0.27	0.48	0.10	0.15
Illinois (Urbana)	0.32	0.47	0.03	0.18
John Carroll University	0.38	0.53	0.04	0.05
Miami University	0.36	0.55	0.04	0.05
Notre Dame (University)	0.21	0.48	0.10	0.21
Pennsylvania (University)	0.24	0.50	0.08	0.18
Providence College	0.33	0.49	0.05	0.12
University of Richmond	0.26	0.51	0.06	0.17
William and Mary	0.34	0.45	0.03	0.18
Wisconsin (Madison)	0.31	0.56	0.04	0.09

Table 9

Proportion of Management Department courses teaching QSCs

Program	Accounting_QSC	Finance_QSC	Management_QSC	Marketing_QSC
Babson	0.11	0.13	0.18	0.58
Bentley	0.20	0.18	0.52	0.10
Boston College	0.10	0.12	0.16	0.62
Boston University	0.01	0.11	0.59	0.29
Fordham University	0.13	0.13	0.59	0.15
Georgetown University	0.04	0.25	0.50	0.21
Illinois (Urbana)	0.06	0.04	0.37	0.53
John Carroll University	0.08	0.20	0.56	0.16
Miami University	0.15	0.29	0.47	0.09
Notre Dame (University)	0.05	0.20	0.45	0.30
Pennsylvania (University)	0.06	0.40	0.37	0.17
Providence College	0.37	0.26	0.17	0.20
University of Richmond	0.07	0.11	0.56	0.26
William and Mary	0.01	0.01	0.60	0.38
Wisconsin (Madison)	0.06	0.16	0.47	0.31

Table 10

Proportion of Marketing Department courses teaching QSCs

Program	Accounting_QSC	Finance_QSC	Management_QSC	Marketing_QSC
Babson	0.06	0.06	0.18	0.70
Bentley	0.06	0.06	0.15	0.73
Boston College	0.04	0.04	0.06	0.86
Boston University	0.03	0.02	0.10	0.85
Fordham University	0.09	0.09	0.12	0.70
Georgetown University	0.01	0.03	0.15	0.81
Illinois (Urbana)	0.06	0.04	0.37	0.53
John Carroll University	0.04	0.04	0.17	0.75
Miami University	0.07	0.09	0.12	0.72
Notre Dame (University)	0.03	0.03	0.11	0.83
Pennsylvania (University)	0.03	0.08	0.10	0.79
Providence College	0.20	0.13	0.08	0.59
University of Richmond	0.02	0.02	0.08	0.88
William and Mary	0.03	0.01	0.10	0.86
Wisconsin (Madison)	0.01	0.01	0.07	0.91

Table 11

Proportions of familiarity with quantitative skills – Sophomore Year

Quantitative Skill	Not Familiar	Vaguely Familiar	Somewhat Familiar	Quite Familiar
Budgeting/Cost Analysis	0.01	0.38	0.31	0.30
Cash Flow Analysis	0.01	0.31	0.38	0.30
Capital Investment Analysis	0.19	0.38	0.37	0.06
Demand Management	0.38	0.19	0.31	0.12
Financial Accounting	0.06	0.06	0.38	0.50
Forecasting	0.38	0.13	0.44	0.05
Logistics Analysis/Planning	0.19	0.38	0.25	0.18
Project Evaluation	0.06	0.44	0.44	0.06
Project Management	0.19	0.38	0.38	0.05
Quality Management	0.25	0.31	0.38	0.06

Table 12

Proportions of familiarity with quantitative skills – Junior Year

Quantitative Skill	Not Familiar	Vaguely Familiar	Somewhat Familiar	Quite Familiar
Budgeting/Cost Analysis	0.07	0.17	0.40	0.36
Cash Flow Analysis	0.07	0.13	0.40	0.40
Capital Investment Analysis	0.17	0.27	0.30	0.26
Demand Management	0.23	0.33	0.31	0.13
Financial Accounting	0.17	0.07	0.13	0.63
Forecasting	0.13	0.27	0.30	0.30
Logistics Analysis/Planning	0.23	0.17	0.43	0.17
Project Evaluation	0.23	0.23	0.27	0.27
Project Management	0.13	0.23	0.34	0.30
Quality Management	0.17	0.37	0.30	0.16

Table 13

Proportions of familiarity with quantitative skills – Senior Year

Quantitative Skill	Not Familiar	Vaguely Familiar	Somewhat Familiar	Quite Familiar
Budgeting/Cost Analysis	0.06	0.15	0.41	0.38
Cash Flow Analysis	0.03	0.21	0.35	0.41
Capital Investment Analysis	0.09	0.21	0.35	0.35
Demand Management	0.06	0.26	0.53	0.15
Financial Accounting	0.03	0.06	0.44	0.47
Forecasting	0.03	0.24	0.32	0.41
Logistics Analysis/Planning	0.12	0.26	0.33	0.29
Project Evaluation	0.03	0.29	0.35	0.32
Project Management	0.03	0.18	0.41	0.38
Quality Management	0.05	0.41	0.23	0.31

Table 14

Alumni ratings of the relative importance of QSCs

Null Hypothesis: For each business function there is no statistically significant difference in the importance (measured by frequency of use in the workplace) between the quantitative skill classes(QSCs), $\alpha = 0.05$

Levels – I: Rarely, II: Sometimes; III: Most of the time; IV: Always

Quantitative Skill Classes: Accounting_QSC, Finance_QSC, Management_QSC, Marketing_QSC

Business Function	chi-squared	p-value
Accounting	5.3126	0.1503
Finance	5.8512	0.1191
Management	3.4436	0.3281
Marketing	4.2762	0.2331

Table 15

Departmental emphasis on QSCs across fifteen business programs

Null Hypothesis: For each of the four departments, there is no statistically significant difference in emphasis on the four quantitative skills classes (QSCs) exists, $\alpha = 0.05$
Quantitative Skill Classes (QSCs) - I: Accounting_QSC, II: Finance_QSC, III: Management_QSC, IV: Marketing_QSC
Departments – Accounting, Finance, Management, Marketing
Business Programs: See appendix

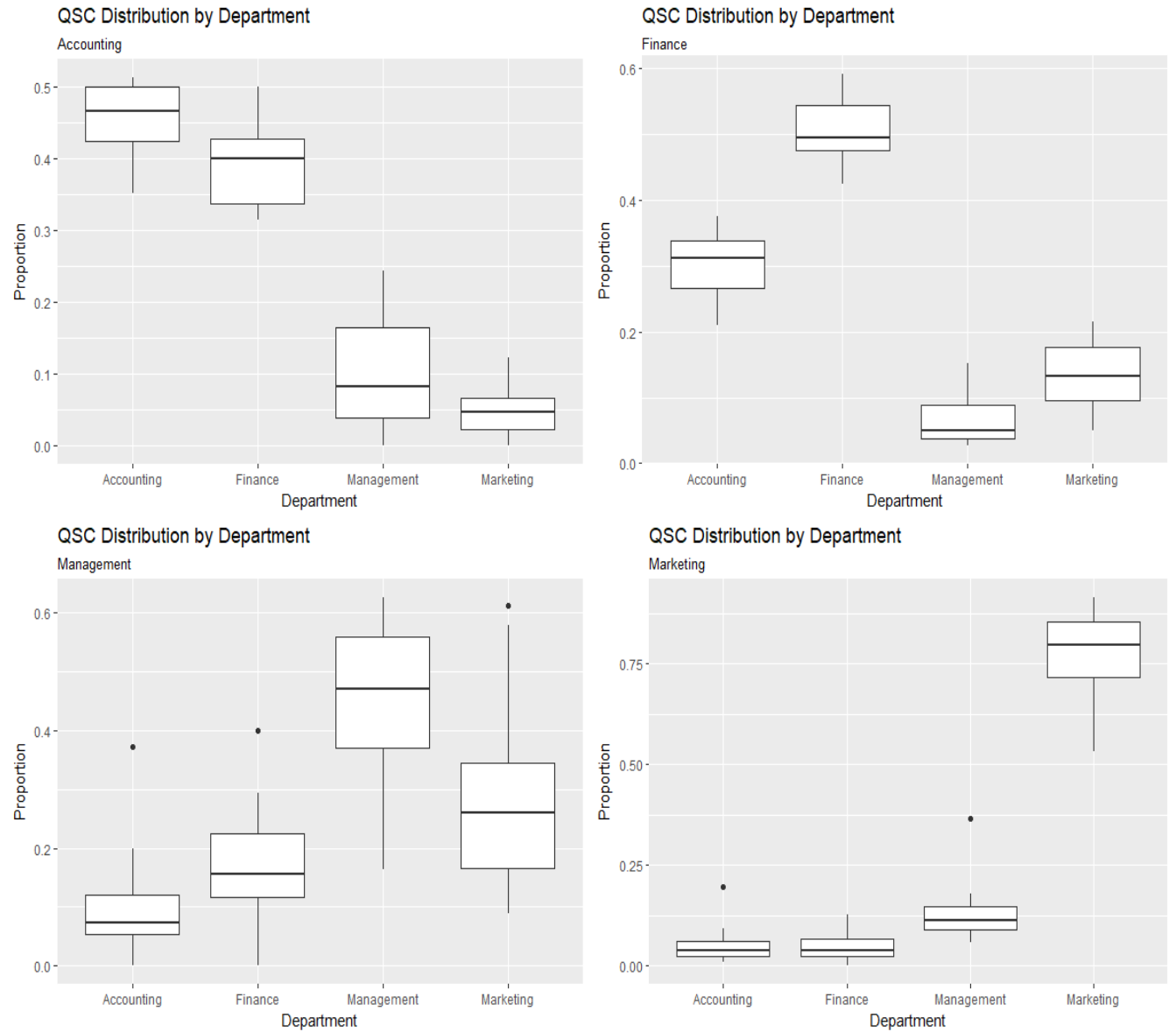| Department	chi-squared	p-value
Accounting		
Across all QSCs	47.07	3.358e-10
- Pairwise		
- QSC I and II		0.012
- QSC I and III		1.7e-05
- QSC I and IV		1.7e-05
- QSC II and III		7.7e-08
- QSC II and IV		1.7e-05
- QSC III and IV		0.068
Finance		
Across all QSCs	52.771	2.052e-11
- Pairwise		
- QSC I and II		7.7e-08
- QSC I and III		7.7e-08
- QSC I and IV		7.7e-08
- QSC II and III		7.7e-08
- QSC II and IV		7.7e-08
- QSC III and IV		0.00053
Management		
Across all QSCs	29.88	1.463e-06
- Pairwise		
- QSC I and II		0.07894
- QSC I and III		8.7e-05
- QSC I and IV		0.00113
- QSC II and III		0.00094
- QSC II and IV		0.07894
- QSC III and IV		0.07894
Marketing		
Across all QSCs	44.186	1.378e-09
- Pairwise		
- QSC I and II		0.96689
- QSC I and III		0.00013
- QSC I and IV		7.7e-08
- QSC II and III		0.00032
- QSC II and IV		1.4e-05
- QSC III and IV		7.7e-08

Table 16

Figure 1

Student familiarity with QSCs by year – levels I and II

Null Hypothesis: For each QSC there is no statistically significant difference in familiarity (levels I and II combined) between student years, α = 0.05		
Levels – I: Not Familiar II: Vaguely Familiar		
Years: Sophomore, Junior, Senior		
Business Function	chi-squared	p-value
Accounting_QSC	1.7619	0.4144
Finance_QSC	0.9541	0.6206
Management_QSC	4.4050	0.1105
Marketing_QSC	2.4147	0.2990

Table 17

Student familiarity with QSCs by year – levels I and II

Null Hypothesis: For each QSC there is no statistically significant difference in familiarity (levels III and IV combined) between student years, α = 0.05		
Levels – III: Somewhat Familiar IV: Very Familiar		
Years: Sophomore, Junior, Senior		
Business Function	chi-squared	p-value
Accounting_QSC	2.5014	0.2863
Finance_QSC	2.1149	0.3473
Management_QSC	4.1436	0.1260
Marketing_QSC	2.1743	0.3372

Table 18