Course Correlates with QR Proficiency: A Transcript Analysis

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What do I want to know?

- Students take many courses. Which ones are correlated with stronger QR at the end of the sophomore year (ie end of general education, more or less)?
- What might these patterns tell us about the efficacy of alternative QR graduation requirements?

Where does QR assessment data come from?

- Sophomore writing portfolio
  - 3-5 papers by each student written across curricular division that demonstrate thesis-driven argument, analysis, observation, interpretation, and use of sources

Where does QR assessment data come from?

- QuIRK rubric
  - QR relevance: central, peripheral, none

"Even for works that are not inherently quantitative, one or two numeric facts can help convey the importance or context of your topic."

-Jane Miller

The Chicago Guide to Writing About Numbers

Where does QR assessment data come from?

- QuIRK rubric

Example:[Introduction to a discussion of alternative philosophical definitions of poverty]

> "Throughout history, there has always been a varying distribution of wealth among the population of the world, resulting in the extremes of the very wealthy, the very poor, and everything in between. Today, we live in a highly industrialized society in which we are seeing patterns of distribution emerge that we have never seen before. "

Where does QR assessment data come from?

- QuIRK rubric
  - Extent of QR

    None….one or two places….throughout paper

Where does QR assessment data come from?

- QuIRK rubric
  - Quality of QR
    - 4-point scales which differ between central & peripheral use
      - 1~fails to do at all or substantially fails in use of QR
      - 2~partial success, but some reservations
      - 3~good
      - 4~exemplary

Summary Statistics

	By papers' QR relevance			
	All Papers	Centrally Relevant	Peripherally Relevant	Not QR Relevant
	n=1,105	n=286	n=235	n=584
Academic Division				
Arts and Literature	32.0%	14.3%	29.4%	44.9%
Humanities	20.8%	9.1%	21.7%	28.3%
Natural Sciences	13.6%	39.2%	8.1%	4.6%
Social Sciences	23.3%	32.2%	32.3%	17.6%
Interdisciplinary	5.3%	5.2%	8.5%	4.6%
Total	100%	100%	100%	100%
Rated QR Quality				
Rating = 1 (low)	36.0%	20.2%	54.9%	-
Rating = 2	27.8%	31.5%	23.4%	-
Rating = 3	30.0%	37.3%	21.3%	-
Rating = 4 (high)	6.2%	11.0%	0.4%	-
Total	100%	100%	100%	-

Results: Calc & Intro Stats

	No Calculus	Calculus I, but not Calculus II	Calculus II, but not Calculus III	Calculus III
Central Relevance				
Quality Score	n=118	n=48	n=32	n=103
1	22.0%	10.4%	21.9%	22.3%
2	30.5%	41.7%	28.1%	28.2%
3	38.1%	45.8%	34.4%	32.0%
4	9.3%	2.1%	15.6%	17.5%
Pearson chi^2 p-value		0.08	0.42	0.09
Wilcoxon rank-sum probability (p-value)		0.51 (0.75)	0.52 (0.70)	0.52 (0.58)

Results: Principles of Economics

	No Principles of Economics	One Course, but Not Both	Both Principles Courses
Central Relevance			
Quality Score	n=152	n=81	n=68
1	19.1%	23.5%	19.1%
2	30.3%	28.4%	36.8%
3	37.5%	35.8%	36.8%
4	13.2%	12.4%	7.4%
Pearson chi^2 p-value		0.89	0.51
Wilcoxon rank-sum probability (p-value)		0.48 (0.57)	0.47 (0.45)

Results: Science courses (ordered probit)

	Centrally Relevant			Peripherally Relevant		
	(1)	(2)	(3)	(4)	(5)	(6)
Science courses	0.083 (0.019)	0.075 (0.029)	0.062 (0.030)	0.004 (0.027)	-0.025 (0.041	-0.026 (-0.041)
Science major		0.075 (0.198)	0.125 (0.202)		0.263 (0.271)	0.303 (0.271)
ACT Math score			-0.002 (0.004)			0.005 (0.005)
Observations	301	301	288	246	246	242

Note: Standard errors in parentheses.

Results: QR First-Year Seminar

	No QR-Revised Courses	QR First-Year Seminar
Central Relevance		
Quality Score	n=287	n=14
1	20.6%	14.3%
2	31.4%	28.6%
3	38.0%	14.3%
4	10.1%	42.9%
Pearson chi² p-value		0.00
Wilcoxon rank-sum probability (p-value)		0.63 (0.09)
Peripheral Relevance		
Quality Score	n=241	n=5
1	55.6%	20.0%
2	23.2%	20.0%
3	20.8%	60.0%
4	0.4%	0.0%
Pearson chi² test p-value		0.20
Wilcoxon rank-sum probability (p-value)		0.72 (0.06)

What does it all mean?

- Non-correlations may not mean no learning gains: Calc, stat, and econ may teach other QR facets.
- Positive effects of science complements JMU findings related to different QR facets.
- QR first-year seminar suggests intentional teaching yields learning gains.