An Interactive Qualifying Project Report
ON

College Program Rankings
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Abstract

This report analyzes current methods of ranking college programs, and compares them to the preferences of students, educators, employers, and other individuals. Ranking sources are located and classified by the ranking criteria used. A survey is conducted of the general population that determines attitudes towards various ranking criteria. The paper concludes with a comparison between attitudes of survey respondents and the actual criteria used by ranking sources.

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Chapter 1

Introduction

College rankings claimed the national spotlight upon the 2013 release of the Department of Education's College Scorecard [3], which attempts to rate colleges, giving prospective students and families a tool for college planning. They are far from the first and far from the only organization to rate colleges. College rankings have a long history in the Unites States. Presently there are many college rankings, the most well-known being the U.S. News and World Report rankings (frequently shortened to US News) [17]. However, students searching for colleges and universities may be interested in more than just the overall quality of an institution–they may be interested in the quality of a particular program at that institution. There is therefore a demand for a different class of rankings: program rankings.

1.1 Problem Statement

To perform any analysis or draw any conclusions regarding the state of college program rankings, one must first identify the existing rankings. This is the first goal of our project: to catalog existing college program rankings and identify the methodology they each use.

The second goal is to determine whether or not the existing college program rankings are adequately meeting the needs of those using them as a tool.

1.2 Motivation

1.2.1 College Rankings

Impact of Rankings

Doing a thorough examination of rankings could be considered to be only worthwhile if those rankings actually have some impact, on institutions or on the students decisions. A study on the impact of US News' rankings found that a gain of just one position in the rankings increases the number of applications that an institution receives [11]. What may be alarming is the impact rankings can have on the policies of institutions. The Washington Post reports that some colleges have adjusted their admissions and financial policies in an effort to improve their positions in the rankings, and some have even gone so far as to intentionally misreport information [12].

The modification of policies in order to improve an institution's position may be seen as institutions being held accountable and responding to criticism, as suggested by President Obama [1], or it may be seen as a classic example of the popularly cited Goodhart's Law, originally formulated as "As soon as the government attempts to regulate any particular set of financial assets, these become unreliable as indicators of economic trends," or more popularly as "When a measure becomes a target, it ceases to be a good measure [13]."

White House College Rankings

In 2013, the U.S. Department of Education unveiled the "College Scorecard," described as a "planning tool to help students and their families make more educated decisions about college" [2]. Led by the department's College Affordability and Transparency Center, the tool rates colleges on factors relating to their affordability and performance, including statistics such as net cost, graduation rate, loan default rate, and median borrowing [3]. Figure 1.1 is a screenshot of the tool as of February 2015. The tool has already been met with criticism from academics and politicians [4], raising many questions around the question of "How should colleges and universities be evaluated?" and even "Should we attempt to rate colleges at all?"

The College Scorecard is part of a larger scheme to stymie "soaring" college tuition prices, and hold Universities accountable for their performance [1]. In the US, the trend has been an ever-increasing number of college

Figure 1.1: A screenshot of the Department of Education College Scorecard for a particular institution, as of February 2015 (source: http://www.whitehouse.gov/issues/education/higher-education/college-score-card)

enrollments–the overall college enrollments rates have grown from 26 percent in 1980 to 41 percent 2012, and the increase was primarily driven by for-profit colleges [7]. However, growing even faster than college enrollment is the price of college. College is around 11 times more expensive now than it was 35 years ago [8]. When announcing the Scorecard President Obama said that higher education is "an economic imperative that every family in America should be able to afford [1]." The tool ostensibly makes it easier for families and students to analyze the costs and benefits of attending college or university.

Criticisms of College Rankings

The Scorecard has also been met with heavy criticism from various sources. Academics have claimed that the Scorecard presents "misleading metrics," presents only a "short-term perspective" on the cost/benefits of attending an institution, and that it measures "too narrow of a definition of institutional performance [4]." Several Republican congressmen have also spoken out, voicing concerns about the effects of "regulation" on the market for colleges, saying that it could "curtail the very innovation we hope to encourage," and that it's a "slippery slope, and one that ends with the private sector inevitably giving up more of its freedom to innovate and take risks [1]." Directly relevant to this paper, however, is the criticism that Scorecard is biased towards institutions with a heavier focus on technical fields or profession fields, creating an apples-to-oranges comparison.

Criticisms of independent rankings have been even harsher in some ways. Rojstaczer argued that the US News rankings were "mostly about money," and that they changed their formula every year for the purpose of selling more magazines [14]." It also has been argued that the rankings do not rate colleges "on the fundamental issues of how well colleges and universities educate their students and how well they prepare them to be successful after college [15]."

1.2.2 Importance of Program Rankings

The College Scorecard program has again brought college ratings into the national spotlight. A multitude of independent organizations present their own ratings and rankings, attempting to evaluate universities on a variety of factors. One particular criticism stands out that applies to Scorecard as well

as many of these rankings: They are frequently systematically biased towards certain fields. Scorecard, with its focus on post-graduation salaries, is biased towards institutions with a focus on technical and professional fields, critics say [9]. Aside from some calling this unfair, it can create further problems when deciding on an institution for a particular program. It may be that, for instance, a Liberal Arts degree at an Engineering school with high average post-graduation success on Scorecard may be less profitable than a Liberal Arts degree at a Liberal Arts school with low average post-graduation success.

For this reason, while Scorecard is perhaps a good start, it appears that there is a need for ratings that evaluate on the program level, instead of examining the university as a whole. While Scorecard may be trustworthy on some level due to being an official government program, available ratings and rankings for college programs are performed exclusively by independent organizations, some who may be trustworthy and some who are not. In addition it may be that the rating factors needed for a quality assessment of college programs are completely different from that of institutions as a whole. This presents a motivation for this paper: a thorough examination of available program ratings, and a study into which factors are important when evaluating programs.

1.2.3 Past Projects

An Interactive Qualifying Project team in 2014 examined various rankings and rating sources for colleges and universities. Their results will be covered in more detail in Chapter 2, but among their principal findings was a discrepancy between the factors that people considered important, and the factors that were considered most prominently in rankings [10]. Their results suggest that in some sense, the rankings are not doing their job in delivering rankings that reflect what people value. One of the goals of this project therefore is to establish whether the same is true of program rankings.

1.3 Project Goals and Approach

1.3.1 Goals

In the light of the motivations presented in Section 1.2, we present three main goals, which also represent the three major sections of this paper:

1. *Examine, catalog, and classify factors used by existing college program rankings.*

   In other words, determine which rankings exist and how they evaluate college programs, and quantify this information such that it can be easily evaluate and compared. Then analyze this data, comparing rankings across program types, program level, and other axes.

2. *Determine the value of evaluation factors.*

   While trying to measure the importance of factors directly is difficult or impossible, it is possible to conduct a survey in order to determine how people value certain factors. This is exactly what we did in this project. It can again be analyzed across a number of axes.

3. *Compare the use of factors by program rankings to their perceived value.*

   Finally, we compare 1 and 2, allowing us to determine how good of a job program ranking sources are doing at evaluating programs along the factors that real students, employers, and educators consider important.

1.3.2 Ranking Categories

Continuing off the work of the previous IQP team [10], we have designated six ranking primary categories that factors used in the evaluation of programs fall under. These are consistent with the factors presented by the 2014 IQP team. These categories are:

- *Academics* - Factors related to the academic performance of program, such as academic reputation, student-faculty ratio, and graduation rate.

- *Finance* - Factors related to the affordability of a program, such as cost, financial aid, and loan size.

- *Post-Graduation Success* - Factors related the success of students after graduation, such as average starting salary, or acceptance rate into graduate school.

- *Research* - Factors related to the quality of the research performed within a program, or by the associated department's faculty, such as number of citations, or research funding.
- *Student Body* - Factors related to the quality of the incoming student body, such admission rate, mean SAT/ACT scores, and diversity.
- *Student Life* - Factors related to the daily life of students in the program, such as athletics, ROTC size, and social scene.

1.3.3 Subject Areas

In order to simplify our examination, we grouped programs into broader subject areas. While the subject areas selected are by no means meant to represent the entirety of academic study, they were intended to provide a reasonably diverse set of programs to compare between. The subject areas are:

- *Business*
- *Computer Sciences*
- *Engineering*
- *Liberal Arts*
- *Science*

1.4 Road Map

- In Chapter 2, we go into further detail regarding the history of college rankings and discuss the current state of them.
- In Chapter 3, we begin by cataloging existing program rankings, and identify the methodology they use. We determine which rankings we will include in our analysis, and which ones to discard.
- In Chapter 4, we classify the methodologies used by college program rankings according to our Ranking Categories, the Data Source, and College-Wide vs. Program-Specific. We assign category weights for each criteria.

- In Chapter 5, we go into detail in analyzing and comparing the methodology used by college program rankings. We compare across Subject Areas, Graduate vs. Undergraduate, and other splits.
- In Chapter 6, we introduce a survey distributed to the public that attempts to determine attitudes toward important characteristics of college program rankings.
- In Chapter 7, we compare the results of the survey to our results on existing college program rankings. We also compare our results the results of the previous IQP study on college rankings.
- We finish in Chapter 8 with an overview of our major findings and recommendations for future work.

Chapter 2

Background

2.1 Early College Rankings

According to The Center for College Affordability, *Where We Get Our Best Men* contained the first numerical ranking of colleges [5]. In *Where We Get Our Best Men* Alick Maclean attempted to examine the factors that produced great people, and produced an ordered list of universities ranked by the number of "eminent men" they produced. So the first ever college ranking actually arose from a broader look at the conditions that produced great people.

Raymond Hughes broke away from the early trend of relying on the number of important graduates by conducting a survey of his fellow academics regarding the reputation of different departments [6]. Hughes' first survey, conducted in 1925, was only concerned with the graduate level, and only polled Hughes' colleagues at Miami University in Ohio. Hughes made one more contribution to the world of college rankings with his 1925 study; it was concerned with ranking individual programs within universities.

Nine years later, Hughes conducted a much larger version of his original reputation study, which covered thirty more disciplines than the twenty of the original study [5]. In this study, he first requested lists of the top 100 academics in each of the fields that he was surveying, and then sent out polls to each of the academics in the lists provided, of which around half responded. Hughes in this case decided to only compile a list of college departments above some cutoff, with no order beyond this cutoff. Hughes made the observation that the opinions of academics tend to lag years behind the quality of the

actual institutions in question, as up and coming departments take time to make reputations for themselves.

According to *College Rankings History, Criticism and Reform* by Luke Myers and Jonathan Robe, between 1934 and 1959, reputation based rankings fell by the wayside, but between 1959 and 1966, five reputation-based rankings were compiled [5]. The seminal reputation based survey of the period, the Assessment of Quality in Graduate Education, otherwise known as the Cartter Report, was published in 1966 [5]. Cartter asked department heads, senior scholars, and junior schollars to fill out a ranking on a scale of one to five, and was also concerned with departmental rankings rather than rankings that rated schools overall.

2.2 Previous IQP Work

This project builds off of prior work done by a past IQP that attempted to analyze rankings that looked at entire colleges as a whole rather than individual departmental rankings [10]. The past IQP noted that all metrics used by various sources could be generalized into a small set of categories such as success after graduation. The past IQP also looked at the distinction between college rankings in the United States, and college rankings that applied world wide.

The prior IQP looked at five US-only college ranking sites, and another five world-wide ranking sites. They concluded that the different ranking sites differed enough that a survey was required in order to determine what those using the sites actually cared about, in order to see how it differed from how the ranking sites determined college ranks. The previous IQP concluded that the factors most desired in college ranking were Academics and Post-Graduation Success.

The results of their survey were used to develop recommendations for of what ranking site to use. The previous IQP suggested looking into the methodology of program rankings as a possible avenue for future work.

2.3 Summary

There have been trends in college and department rankings since they were invented over 100 years ago. Since the early 1960s, the most common and

popular type of survey has been the expert survey.

This IQP arose from a 2014 IQP that looked at college rankings as a whole rather than looking at rankings for individual departments and how they differ between departments. This project, while going more in depth on the specifics, focused less on international rankings, which were given equal focus in the previous IQP.

Chapter 3

Identifying Available Rankings

3.1 Finding Ranking Sites

This project took three major paths to find available ranking organizations. The web was searched for terms such as "best colleges" and "college rankings", as well as more specific terms such as "best computer science departments" and "mechanical engineering department rankings". The idea of the search terms being to capture a cross section of college ranking sites that would be found by college applicants. A collection of college department heads in the fields covered by this report were asked if they knew of any rankings which were well regarded in their fields, which yielded nothing of note. A large book store nearby was also visited to see what print media was available, and also yielded nothing of note, at least for department rankings.

3.2 Subject Areas

In order to find a reasonable cross section of program rankings, broad categories which covered most types of college program were developed. Computer Sciences, which was covered by Computer Science and Gaming (Game Design), represents a new and very fast growing area. Engineering as a category represents all traditional engineering disciplines; which were represented in this project by Electrical Engineering, Mechanical Engineering, and Robotics Engineering. Humanities and Arts represents all of the classical humanities disciplines and were represented in this study by History, Music, Psychology, and the general category "Liberal Arts". Business as an area

was chosen to essentially fill in the gaps, and because the MBA as a program might produce interesting information. It was assumed that traditional sciences might have different interests than engineering disciplines, because it fits into the academic, non-profit driven side of STEM; it was represented by Biology and Chemistry.

US News and World Report has a number of breakdowns for college rankings, some of which focus on a specific subject area, and some of which focus on breakdowns not within the scope of this paper. The subject areas covered ended up as a subset of this paper's categories. College Factual grouped their program rankings into the following areas: Arts and Humanities, Public/Social Services, Social Sciences, Business, "Trades, Skills, and Services, and Miscellaneous", STEM, Health and Medicine, and Multidisciplinary Studies. Covering every subject area would be outside of the scope of this project, so some categories were discarded by a fairly subjective measure of what seemed "interesting".

3.3 Results of Ranking Searches

According to our research, there are more than 20 college ranking sites available online. We classified them into two groups. The first group includes ranking sites that had clearly explained methodologies, and second group includes ranking site that did not list their methodologies. Table 3.1 listed available ranking sites that provided methodologies, and Table 3.2 listed those that did not. Many of the ranking sites that do not have methodologies seem to mostly be purely advertising sites. Some of them, such as US College Ranking, World Ranking Guide, and Good University Ranking Guide just show the results from other ranking site such as US News.

3.4 Summary

This paper looked at a number of methods of finding college rankings, although ended up finding that web searches provided almost all of the results. Several programs were chosen as representatives for different subject areas in an attempt to reduce the amount of work needed, while still examining rankings that were representative of most program rankings. In the end, the following programs were chosen, Computer Science, Gaming, History, Music,

Psychology, Liberal Arts, Business, Biology, Chemistry, Electrical Engineering, Mechanical Engineering, Robotics. Some of the ranking sites lacked methodologies, which meant that they did not provide any useful information, so only ranking sites that provided methodology sections were selected for analysis.

Table 3.1: List of sites with available methodologies.

Ranking sites with methodologies	Computer Science	Gaming	History	Music	Psychology	Liberal Arts	Business	Biology	Chemistry	Electrical Engineering	Mechanical Engineering	Robotics
US News	x		x		x	x	x	x	x	x	x	
CollegeFactual	x		x	x	x	x	x	x	x	x	x	x
NRC			x	x	x			x	x	x		
Shanghai Rankings	x		x				x	x	x	x	x	
QS	x		x		x		x	x	x	x	x	
Super Scholar	x				x		x					
Graduate Programs	x		x		x		x	x		x	x	
CollegeXpress	x				x		x					x
Business Insider	x						x			x	x	x
Bloomberg Business Week							x					
Forbes							x					
Payscale	x	x	x		x	x	x	x	x	x	x	
Best Value Schools		x								x	x	
LinkedIn	x			x			x					
Princeton Review		x										

Table 3.2: List of sites without available methodologies.

Ranking sites with no methodologies	Computer Science	Gaming	History	Music	Psychology	Liberal Arts	Business	Biology	Chemistry	Electrical Engineering	Mechanical Engineering	Robotics
Profit Bricks	x											
Education Portal	x		x	x	x	x	x	x	x	x	x	
ETCHMAG												x
Good University Ranking Guide	x	x	x	x	x	x	x	x		x	x	x
BearShare				x								
MusicColleges.com				x								
World Ranking Guide	x	x	x	x	x	x	x	x	x	x	x	x
Petersons	x		x	x		x	x			x	x	
US College Rankings	x			x		x		x	x	x	x	
Design School Hub		x										
The Best Colleges		x					x					

Chapter 4

Classifying Available Rankings

4.1 Methodology

In Chapter 3, we identified available ranking sources to focus on. The list of these rankings can be found in Table 3.3. In this chapter, we classify these rankings according to certain sets of criteria. The first set of criteria was introduced in Section 1.3.2: Ranking Categories. These categories represent properties of the program that rankings sources use to generate their rankings. The second set of criteria is the Data Source. The three possible data sources are Objective Data such as admission statistics, Expert Opinion such as from department heads, and Student Opinion such as surveys distributed to college students; the data sources are explained in detail below. The third set of criteria considers whether the ranking factors are specific to the program, or are college-wide. We then calculate weights within each criteria set.

4.1.1 Ranking Categories

The categories introduced in Section 1.3.2 are the first and primary criteria we used to classify rankings. They represent properties of the program that rankings sources use to generate their rankings. These categories are:

- *Academics* - Factors related to the academic performance of program, such as academic reputation, student-faculty ratio, and graduation rate.

- *Finance* - Factors related to the affordability of a program, such as cost, financial aid, and loan size.
- *Post-Graduation Success* - Factors related the success of students after graduation, such as average starting salary, or acceptance rate into graduate school.
- *Research* - Factors related to the quality of the research performed within a program, or by the associated department's faculty, such as number of citations, or research funding.
- *Student Body* - Factors related to the quality of the incoming student body, such admission rate, mean SAT/ACT scores, and diversity.
- *Student Life* - Factors related to the daily life of students in the program, such as athletics, ROTC size, and social scene.

We also included an "Other" category for factors that we felt did not fit into the other categories.

4.1.2 Data Source

While the above criteria examines what the data ranking sites use attempt to measure about the programs, it is also important to look at how the data is generated. We broke this into three categories:

- *Objective Data* - This category refers to data that is specifically measurable and objective. For example, "Mean SAT Score" would be considered Objective Data, while "Friendliness of Professors according to students" would not.
- *Expert Opinion* - Data generated from the opinion of experts, such as individuals involved in academia, or employers. An example of this might be surveying Departments Heads about their opinions on the quality of departments at other schools, or asking employers how qualified individuals who graduated from certain programs are.
- *Student Opinion* - Data generated from the opinions of students at particular programs. For example, asking the students "How much do you enjoy your classes?" would be categorized as Student Opinion.

4.1.3 College-wide vs. Program Specific

A piece of data that a ranking source uses to rank programs may either pertain specifically to the program being ranking, or to the entire institution. Therefore, to reflect this we determined the weight each ranking source used for College-Wide data, and Program-Specific data. For example, say a ranking source uses the SAT scores for an entire incoming freshman class to rank Chemistry programs, as this information is not frequently available at the program level. This data would be classified as "college-wide." Now imagine this source also considers the number of citations that each Chemistry department produced. This data would be classified as "program-specific" because it pertains only to the Chemistry program, not the larger institution.

4.1.4 Weights

For each set of criteria, we determined how much each ranking source considered each category, by determining the *weight* of each category for that ranking source. The weight for each category is between 0 and 100 percent. The total weight for a set of criteria is 100 percent.

4.2 US News

US News provides a similar description of their methodology for each of its program rankings [19]. This example is specifically from their rankings of science programs:

"Rankings of doctoral programs in the sciences are based solely on the results of surveys sent to academics in biological sciences, chemistry, computer science, earth sciences, mathematics, physics and statistics. The individuals rated the quality of the program at each institution on a scale of 1 (marginal) to 5 (outstanding). Individuals who were unfamiliar with a particular school's programs were asked to select 'don't know.'"

Ranking Categories

Because the survey question asked about an overall rating of the program, we assigned equal weights to each category.

Data Source

US News bases its rankings entirely on surveys sent out to department heads and other experts, so we gave the Expert category a weight of 100%.

Program-Specific/College-Wide

The survey asks specifically about specific programs, so we gave Program 100%.

4.3 CollegeFactual

According to College Factual's methodology page [20], they weighted their factors as either Low, Med, or High. To convert this to weights, we assigned a numeric value to each one, Low=1, Med=2, High =3. We then added the total weights of all of the categories together, and then set the percentage weight for each category to its weight divided by the total weight. They listed the following factors and weights:

- Major Focus - Med
- Bachelors Degree Market Share - Med
- Masters Degree Market Share - Low
- Doctoral Degree Market Share - Low
- Related Major Focus - Med
- Related Major Breadth - Low
- Relevant Program Specific Accreditation - Med
- Early-Career Salary - High
- Mid-Career Salary - Med
- Best College Ranking - High

There were 2 categories with a "High" weight, 5 categories with a "Medium" weight, and 3 categories with a "Low" weight. Therefore, we computed the total weight to as $2 * 3 + 5 * 2 + 3 * 1 = 6 + 10 + 3 = 19$.

Ranking Categories

We categorized each ranking factor into the appropriate category, and summed them according to their weights relative to the total weight. Overall, Academics received a weight of 26%, Post-Graduation Success received a weight of 26%, Student Body received a weight of 32%, and Other received a weight of 16%.

Academics - 5/19

- Related Major Focus - Med
- Related Major Breadth - Low
- Relevant Program Specific Accreditation - Med

Post-Graduation Success - 5/19

- Early-Career Salary - High
- Mid-Career Salary - Med

Student Body - 6/19

- Major Focus - Med
- Bachelors Degree Market Share - Med
- Masters Degree Market Share - Low
- Doctoral Degree Market Share - Low

Other - 3/19

- Best College Ranking - High

Data Source

All of their factors are focused on objective statistics, so we gave Objective a weight of 100%. (Best College Ranking is also all based on objective statistics.)

Program-Specific/College-Wide

The only statistic included that was not program specific was Best College Ranking, so the weight for Program-specific is 16/19, or 84%, and the weight for College-wide is 3/19, or 16%.

4.4 National Research Council Rankings

According to their methodology page [21], the NRC Rankings list the following major factors:

- Research: Derived from faculty publications, citation rates, grants, and awards.
- Students: Derived from students' completion rates, financial aid, and other criteria.
- Diversity: Reflects gender balance, ethnic diversity, and the proportion of international students.

They have two different methodologies for weighting these categories. The first is S-Rank: Programs are ranked highly if they are strong in the criteria that scholars say are most important. The second is R-Rank: Programs are ranked highly if they have similar features to programs viewed by faculty as top-notch.

Ranking Categories

Their true weights involve the results of the S-Rank and R-Rank calculations, but these weights are not public. Instead, we just assigned an initial weight of to each of their major 3 categories. We then converted these into our own categories. In cases where one of their categories matched more than one of ours, we split it evenly between our categories.

Research maps to our Research category, so Re gets a weight of 1/3. Students doesnt actually seem to match our Student Body category, but it does match Academic and Finance, so each of those get a weight of 1/6. Diversity matches our Student Body, so SB receives a weight of 1/3.

Data source

All of their data is objective, but their weights are set based on expert surveys. Since the actual factors are objective, we gave 100% weight to Objective.

Program-Specific/College-Wide

We were unable to determine which data is at the program-level or the university-level.

4.5 Shanghai Rankings

Shanghai Rankings' methodology [22] listed the following factors and weights:

- Award, which measures the number Nobel Prizes or field-specific prizes for staff members, 15%
- HiCi which measures the number of highly cited researchers for staff members, 25%
- PUB the number of publications for staff members, 25%
- TOP the number of publications in top 20% journals for each field, 25%
- FUND is the amount of research funding, 25%
- Alumni - the number Nobel Prizes or field-specific prizes won by alumni, 10%

Their total weights added up to greater than 100% because not every category was used for every field. However, the relative weights remained the same for every field. Therefore, we scaled the weights according to the total weight of every category (125%). In other words, multiply each weight by 4/5. After adjustment, it looks like:

- Award - 12%
- HiCi - 20%

- PUB - 20%
- TOP - 20%
- Fund - 20%
- Alumni - 8%

Ranking Categories

"Award", "HiCi", "PUB", "TOP", and "Fund" all pertained to research, so "Research" was given a weight of 92%. Alumni fits into Post-Graduation Success, so it receives a weight of 8%.

Data source

All of the factors are Objective, so it receives weight of 100%.

Program-Specific/College-Wide

All of the factors are Program-specific, so it receives weight of 100%.

4.6 QS

The QS Intelligence Unit's rankings methodology [23] listed the following four factors, with the average weights:

- Academic reputation: "For EACH of the (up to five) faculty areas they identify, respondents are asked to list up to ten domestic and thirty international institutions that they consider excellent for research in the given area. They are not able to select their own institution." - 52%
- Citations per Paper: "Journals in Scopus are tagged with a number of ASJC (All Science Journal Classification) codes, which identify the principal foci of the journal in which they were published (multidisciplinary journals are excluded). When aggregated these totals and their associated citations provide an indicator of volume and quality of output within a given discipline." - 14%

- Employer Surveys - "Employers are asked to identify up to ten domestic and thirty international institutions they consider excellent for the recruitment of graduates." - 19%
- H Index: "The h-index is an index that attempts to measure both the productivity and impact of the published work of a scientist or scholar. The index is based on the set of the scientists most cited papers and the number of citations that they have received in other publications." - 15%

Ranking Categories

"Academic Reputation," "Citations per Paper," and "H-Index" are all Research related Factors, so Research receives a total weight of 81%. "Employer Surveys" is a measure of Post-Graduation Success, so that receives the remaining 19%.

Data Source

"Academic Reputation" and "Employer Reputation" are both Expert, so Expert has a weight of 71%. "H-index" and "Citations per Paper" are both Objective, so Objective has a weight of 29%.

Program-Specific/College-Wide

Each factor is program-specific, so "Program-Specific" has a weight of 100%.

4.7 GraduatePrograms

GraduatePrograms.com asks user to answer a survey about the college or university they attend, and allows users to view the cumulative results. They ask 15 questions [24], which we divide here into our Ranking Categories:

Academics

- "Academic Competitiveness: Is the level of peer competition healthy?"
- "Faculty Accessibility & Support: Faculty responsiveness and support outside the classroom"

- "Workload: Is/Was the workload generally manageable? Is/Was the work pertinent, practical, and constructive or just busy work? (Rate 1 for ridiculous level of work and 10 for "very reasonable")"
- "Education Quality: Access to relevant, interesting, challenging courses taught by qualified professors"

Finance

- "Affordability of Living: Include cost of food, housing, entertainment, etc"
- "Financial aid: If you received Financial Aid from your school, how pleased are you with your package (grants, scholarships, etc.) and the application process?"

Post-Graduation Success

- "Career Support: Quality of careering planning resources and support received both during graduate school and after"

Student Body

- "Student diversity: A student population representative of the countrys larger diverse population"

Student Life

- "Campus Safety: How safe you felt; the efficiency of and access to campus security."
- "Social Life: Accessibility to the social scene (meeting and making friends and/or dating)"
- "Surrounding Area: Does the location enrich your overall experience, enhance the school socially and/or culturally? Offer job opportunities?"
- "Transportation: Degree to which public transportation works for you, both for academic and social settings"

Other

- "School Use of Technology: Access to the most cutting edge technology required for your field of study"
- "Quality of Network: Does/Did your program provide you strong peer, faculty, and alumni networking connections and opportunities?"
- "Grad Program Value: Overall, how satisfied are you with your graduate program? Did you make the right choice? Would you choose this program again?"

Ranking Categories

Each question asked in their survey was given the same weight. The weight for each category therefore was the number of questions in that category divided by the total number of questions. Given the breakdown above, that results in the following:

- Academics - 4/15 = 27%
- Finance - 2/15 = 13%
- Post-Graduation Success - 1/15 = 7%
- Student Body - 1/15 = 7%
- Student Life - 4/15 = 27%
- Other - 3/15 = 20%

Data source

Their data is 100% based on Student surveys, so we gave Student Opinion 100%.

Program-Specific/College-Wide

We categorized each question into collegewide/program-specific. Their results for program rankings were filtered by major, but certain factors should not vary in theory between programs a college (for example, campus safety). If we were unsure of where to put a factor, we put it as program specific. The totals were 6/15 Collegewide, and 9/15 Program-Specific.

College-Wide: Student Diversity, Campus Safety, Social Life, Surrounding Area, Transportation, Affordability of Living.

Program Specific: Academic Competitiveness, Faculty Accessibility, Workload, Education Quality, Financial Aid, Career Support, School Use of Technology, Quality of Network, Graduate Program Value

4.8 CollegeXpress

From CollegeXpress's FAQ [25]:

"Most of our lists come from a book called The College Finder by Steven R. Antonoff, an educational consultant from Denver, Colorado. The lists are a product of his research, the input of countless other higher education professionals, and student user suggestions."

You'll also see designations showing whether the list was produced by Experts, Facts, or Users: When we say "Experts," we mean the list is subjective and based on the input of higher education insiders (like Mr. Antonoff!). With Facts, that just means the lists rely on the cold, hard facts (often from our research division, Wintergreen Orchard House). And, last but never least, User lists are based on your suggestions!"

Ranking Categories

Similar to US news, this is an overall ranking, so we spread the weights even across all categories.

Data Source

While other rankings in the book came from "Facts" or 'Users, " all of the program rankings were 100% from expert opinion, so we categorized this source as 100% Expert.

Program-Specific/College-Wide

Each Ranking was for the particular program, so we rate this source 100% Program-Specific.

4.9 Business Insider

Business Insider's methodology specifies [26]: "Our initial list was compiled by canvassing engineers, industry professionals and entrepreneurs who work at some of the most popular technology companies. We asked respondents to grade schools on a 1 (not valuable) to 5 (most valuable) scale. The score is the average of all responses across those scales."

Ranking Categories

Similar to US news, this is an overall ranking, so we spread the weights even across all categories.

Data Source

This was a 100% expert rankings for each program, so it is 100% Expert.

Program-Specific/College-Wide

While the list was made using industry professionals specific to the type of program, the verbage of the questions asks the respondents to "grade schools," not programs, so we rated this 100% "College-Wide."

4.10 Bloomberg Business Week

To produce their rankings, Bloomberg used a multifaceted approach detailed in their methodology [27]. First, they sent a survey to Seniors at participating schools, asking questions about the quality of their schools Business program. The survey results received a weight of 30%. They then used five different metrics to to assess the "Academic Quality" of each program: Average SAT score for the most recent entering class, Ratio of full-time students to full-time faculty, Average class size in core classes, Percentage of students with business-related internships, and Average number of hours students spend preparing for class per week. The total "Academic Quality" score received a weight of 30%. Next, they sent a survey to employers asking which programs produced the best graduates. This received a weight of 20%. Finally, they used a Median Starting Salary metric that accounted for 10%, and a "Feeder

school" metric that measured which schools send the most grads to the top MBA programs, which also accounted for 10%.

Ranking Categories

We distributed the "Student Assessment" weights across every category. Because there were five "Academic Quality" metrics, with a total weight of 30%, each metric had a weight of 6%. We put each of these metrics in the appropriate category. The "Employer Opinion" section was considered entirely Post-Graduation Success, based on the fact that they asked employers which programs "produced the best graduates." "Median Salary" and "Feeder School" fit cleanly into Post-Graduation Success. So the fall breakdown was:

Academics - 23%

- Student Assessment - 5%
- Ratio of full-time students to full-time faculty (reported by the school) - 6%
- Average class size in core classes (reported by the school) - 6%
- Average number of hours students spend preparing for class per week (reported by the students) - 6%

Student Body - 11%

- Student Assessment - 5%
- Average SAT score for the most recent entering class (reported by the school) - 6%

Research - 5%

- Student Assessment - 5%

Student Life - 5%

- Student assessment - 5%

Finance - 5%

- Student assessment - 5%

Post-Graduation Success - 45%

- Student assessment - 5%
- Employer Opinion - 20%
- Median Salary - 10%
- Feeder school - 10%

Other - 6%

- Percentage of students with business-related internships (reported by the students) - 6%

Their weights look like this:
Student Assessment: 30%
Academic Quality: 30%
Employer Opinion: 20%
Median salary: 10%
Feeder school: 10%

Student Assessment is an overall ranking of the school by the students, so its weight is spread out across all categories Academic Quality is actually 5 different factors, that can be individually mapped to our categories.

Data Source

The Data Sources broke down cleanly:

Objective Data - 50%

- Median salary - 10%
- Feeder school - 10%
- Academic Quality - 30%

Expert Opinion - 20%

- Employer Opinion - 20%

Student Opinion

- Student Assessment: 30%

Program-Specific/College-Wide

It was unclear which data was program-specific due to their ambiguous use of the word school to refer to both the University and the Business School at the University (for example, for SAT scores). Therefore, we declined to categorize this.

4.11 Forbes

Forbes's methodology states [28]: "Our eighth biennial ranking of business schools is based solely on the return on investment achieved by the graduates from the class of 2008 ... We compared the alumni earnings in their first five years out of business school to their opportunity cost (two years of forgone compensation, tuition and required fees). We measure total compensation, including salary, bonuses and exercised stock options"

Ranking Categories

The ROI is a combination of cost and post-graduation success, so we split the weight equally between Finance and Post-Graduation Success.

Data Source

The data was 100% Objective salary and tuition-related data.

Program-Specific/College-Wide

The data was 100% Program-Specific

4.12 Payscale

Payscale's methodology states [29]: "We rank the schools based on the mid-career median salary of the graduates," and "Additionally, similar to the overall school rankings, these schools are ranked based on the median mid-career earnings of graduates within the particular major."

Ranking Categories

Solely based on Post-Graduation Success, so it is given a weight of 100%.

Data source

The data is Objective pay data gathered in their surveys, so "Objective" receives 100% weight.

Program-Specific/College-Wide

The data considers the pay of students with each specific majors, so "Program-Specific" receives a weight of 100%.

4.13 Best Value Schools

Best Value Schools's methodology states [30]: "The rankings are pulled from U.S. News and World Report and listed in order of the institutions 30 Year Average Net Return on Investment, according to Payscale.com."

Ranking Categories

The ROI is basically a combination of cost and post-graduation success, so we split the weight equally between Finance and Post-Graduation Success.

Data source

The data is Objective pay data gathered in their surveys, so "Objective" receives 100% weight.

Program-Specific/College-Wide

The data considers the pay of students with each specific majors, so "Program-Specific" receives a weight of 100%.

4.14 Princeton Review

According to Princeton Review's methodology [31]: "The Princeton Review chose the schools for its 2014 list based on a comprehensive survey it conducted in the 2013 academic year of administrators at 150 institutions offering video game design coursework and/or degrees in the United States, Canada and some countries abroad offering video game design coursework and/or degrees."

It listed 16 questions, which we sorted into the appropriate categories.

Ranking Categories

Nothing is said specifically about weights, so we gave each of their listed questions equal weight and categorized them.

Academics (11/16)

- What game design-related courses do you offer for undergraduates?
- What game design-relevant skills does your program teach?
- Does your gaming program use a team-driven approach?
- If yes, in that team are students paired with other students from different disciplines?
- What percentage of your total undergraduate gaming faculty have started, run or worked for a game studio?
- How many gaming faculty members do you have?
- How many of these are on a tenure track?
- How many departments do they represent?
- What technologies or engines does your school utilize?
- Does your school offer game labs for students to use?
- Does your school offer a game library for students to use?

Post-Graduation Success (5/16)

- What career-related opportunities does your school offer to undergraduate gaming students?
- For the most recent graduating class, what percentage of graduates have worked on a game that has shipped?
- During the 2013 academic year, how many game companies visited your school for any of the following reasons: recruiting, lectures, seminars, demos, collaborations?
- What percentage of graduates have taken a job in some aspect of game development at the time of or before graduating?
- What was their salary?

Data Source

We also gave a weight of 100% to Objective, though a couple of the factors were arguably Expert (for example, What game design-relevant skills does your program teach?), but we felt that because the factors were not opinion or reputation based they were closer to being objective data.

Program-Specific/College-Wide

All of the factors are program-specific, so we gave that a weight of 100%.

4.15 Animation Career Review

Animation Career Review's methodology lists five factors [32]:

- Academic reputation
- Admission selectivity
- Depth and breadth of the program and faculty
- Value as it relates to tuition and indebtedness
- Geographic location

They clarified that the intention with Geographic location was to consider the importance of location for building a career in gaming/animation.

Ranking Categories

They listed five criteria, but did not list their weights, so we considered each of their weights to be (20%), and then sorted them into their appropriate categories.

Academics - 40%

- Academic reputation
- Depth and breadth of the program and faculty

Finance - 20%

- Value as it relates to tuition and indebtedness

Student Body - 20%

- Admission Selectivity

Post-Graduation Success - 20%

- Geographic Location

Data source

Admission selectivity, value (as it relates to tuition and indebtedness), and geographic location are all objective, so objective gets a weight of 60%. Academic reputation and depth and breadth of the program faculty are both based on we reached out to every school under consideration requesting information about their specific program, as well as their perspective regarding which programs they considered the "best", both nationally and regionally. In the instance where we could not obtain information directly from a school, we obtained the necessary information from the school's web site or from other reputable publications., so we assigned a weight of 40% to expert.

Program-Specific/College-Wide

The factors were all judged to be program-specific, so that received a weight of 100%.

4.16 Super Scholar

Super Scholar listed several factors in their description of thier methodology [33]: "academic quality," "program selection," "cost," "economic value," "student satisfaction," "market reputation," and "reputation, recognition, and awards."

Ranking Categories

There was no weighting methodology listed, so we counted each factor as having equal weight, and then assigned that weight our corresponding category. Economic Value falls under both Finance and Post Graduation Success, so its weight we split between the categories evenly.

Academics

- Academic Quality
- Program Selection

Finance

- Cost
- Economic Value (1/2)

Post-Graduation Success

- Economic Value (1/2)

Other

- Student Satisfaction
- Market Reputation
- Reputation, Recognition, and Awards

Data Source

They are non-explicit in how they calculated their ratings for the categories, so we cannot assign weights for the data source.

Program-Specific/College-Wide

They are non-explicit in how they calculated their ratings for the categories, so we cannot assign weights for program-specific/college-wide.

4.17 Summary

We broke down each ranking source, and classified their methodologies according to the our three sets of criteria described in Section 4.1. There was considerable variation in the methodology of each source, but our classification allows us to compare across methodologies in a common format. In Chapter 5, we compile and analyze the data.

Chapter 5

Examination of Available Rankings

We compared the various ranking sites listed in Chapter 4 with multiple breakdowns to see if any patterns became evident. Our breakdowns included comparing each ranking site by what categories they used as criteria for ranking, as well as which departments and programs (graduate or undergraduate) they ranked. We are also compared the usage of ranking categories, how much each of them factored into rankings, and with what department they were evaluating. Analysis of ranking site evaluation data enabled the creation of four types of tables and charts. The first set of tables and charts illustrates the weights allocated by ranking sites for the six chosen categories. The second set illustrates the three types of data source used by each ranking site. The third set illustrates the weights applied by the ranking sites for all six chosen categories per field of study. The final set illustrates the weights for all six categories for three types of school coverage, undergraduate only, graduate only, and a combination of both.

5.1 Weights by Ranking Site by Category

Most of ranking sites criteria can be grouped into our main six categories (Student Body, Research, Academics, Student Life, Finance, and Post Graduation). However, there are several ranking sites such as Super Scholar, Graduate Programs, and CollegeFactual which put considerable weights beyond the scope of our six categories. Ranking sites listed in Table 5.1 and

Figure 5.1 share the same data set in different formats. Ranking sites are listed in order of discovery, thus indicating what sites we found most easily.

Table 5.1: Metric weightings employed by each ranking site as a percentage of total.

Ranking Site	Student Body	Research	Academics	Student Life	Finance	Post Graduation	Other
US News	17	17	17	17	17	17	0
CollegeFactual	32	0	26	0	0	26	16
NCR	33	33	17	0	17	0	0
Shanghai Rankings	0	92	0	0	0	8	0
QS	0	81	0	0	0	19	0
Super Scholar	0	0	29	0	21	7	43
Graduate Programs	7	0	27	27	13	7	20
CollegeXpress	17	17	17	17	17	17	0
Business Insider	17	17	17	17	17	17	0
Bloomberg Business Week	11	5	23	5	5	45	6
Forbes	0	0	0	0	50	50	0
Payscale	0	0	0	0	0	100	0
Best Value Schools	0	0	0	0	50	50	0
LinkedIn	0	0	0	0	0	100	0
Princeton Review	0	0	69	0	0	31	0
Animation Career Review	20	0	40	0	20	20	0

Table 5.1 shows that Shanghai Rankings and QS put significant weight in the Research category (around 80-90 percent). Payscale and LinkedIn rankings are 100 percent focused on the Post Graduation success category. US News, CollegeXpress, and Business Insider rankings spread weightings over all of the six categories. Princeton Review's ranking is around 70 percent focused on Academics and 30 percent focused on the Post Graduation success category (in fact, people are concerned most about Academics and Post Graduation success according to our survey results).

Figure 5.1 provides a visual look at the weightings employed by each ranking site. All of the ranking sites put weight on Post Graduation success except NRC; and most of the ranking sites put weights on Academics and Finance. Most of the ranking sites that ranked undergraduate programs such as CollegeFactual, Payscale, Best Value School, etc. do not consider Research categories as a factor in their rankings. Also, most of the ranking sites do not consider Student Life as a factor in their rankings.

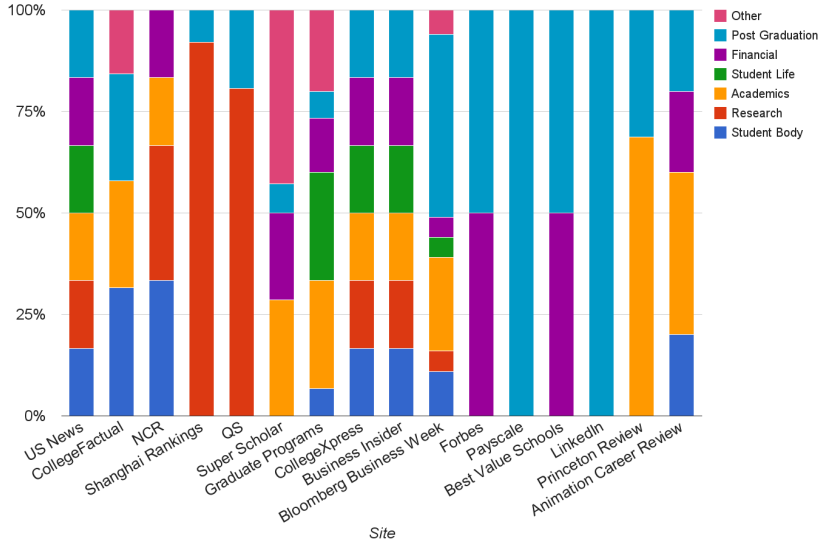

Figure 5.1: Metric weightings employed by each ranking site.

5.2 Weights by Ranking Site by Data Source

We created three categories (data sources), Expert Opinion, Objective Data, and Student Opinion. These were described in detail in Section 4.1.2. Figure 5.2 shows the percent of data sources employed by ranking sites.

Figure 5.2 reveals that Bloomberg Business Week is the only site that includes all three sources: Expert Opinion, Objective Data, and Student Opinion. US News, CollegeXpress, and Business Insider rankings are based

on Expert Opinion while CollegeFactual, NCR, Shanghai Rankings, Forbes, Payscale, Best Value Schools, LinkedIn, and Princeton Review rankings are based on Objective Data. QS and Animation Career Review rankings are based on Expert Opinion and Objective Data. The Graduate Programs ranking is based on Student Opinion.

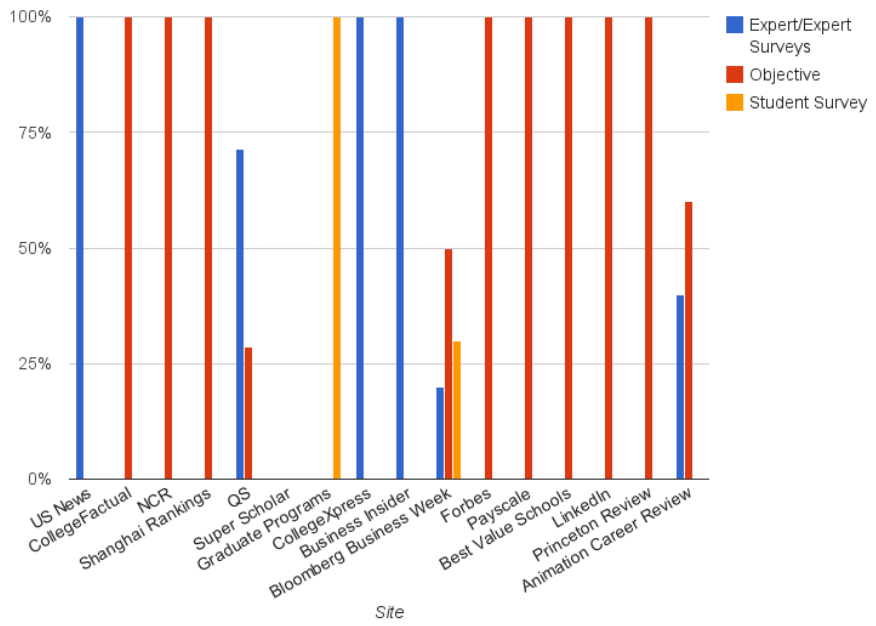

Figure 5.2: Data source employed by each ranking site.

5.3 Weights by Category by Subject Area

The analysis of metric weightings correlated for each field of study required a separate calculation. An example of this calculation is to take the Student Body metric weightings for each field of study for each ranking site and create an average value for all sites. Calculations for all six metrics established average values for all of them. The following ranking sites rank engineering programs: US News, CollegeFactual, Shanghai Ranking, QS, Graduate

Program, CollegeXpress, Business Insider, Payscale, and Best Value School. Based on Table 5.1, the respective weightings employed by those schools are 17%, 32%, 33%, 0%, 0%, 7%, 17%, 17%, 0%, 0%. Hence, the Student Body percent weight in Engineering is (17+32+33+7+17+17)/10 = 12 percent. Figure 5.3 provides a visual look at the average metric weightings for each subject area.

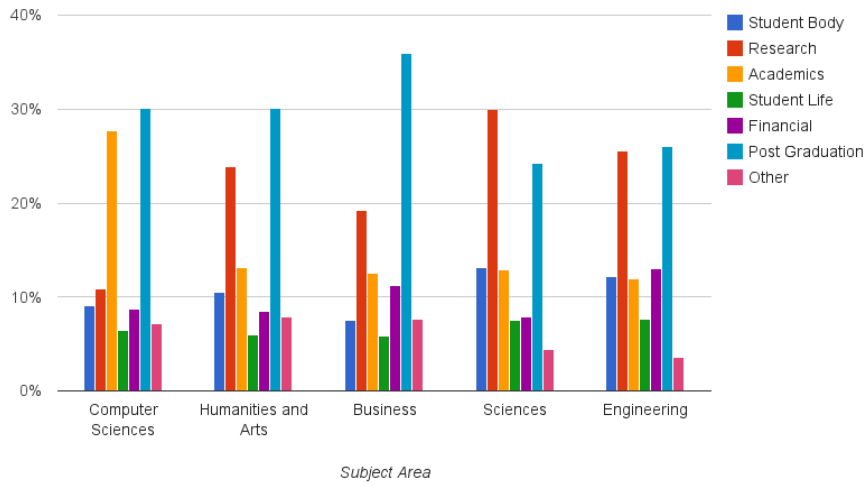

Figure 5.3: Average Metric Weightings for Each Subject Area.

Results in Figure 5.3 show that ranking sites consider Post-Graduation Success and Research as essential factors in all subject area. Computer Science is a special case where Academics are much more important than Research. Student Life seems to be the least important category in all subject areas. Research is the most important category in Science. In other subject areas, Post Graduation success is dominant. Other categories such as Academic, Finance, Student Life fluctuate across subject areas but do not seem to have any statistical significance, as the difference is only a few percent.

5.4 Weights by Category by Graduate/ Undergraduate

The analysis of metric weightings correlated for three types of school coverage (Graduate, Undergraduate or Both) required a separate calculation. An example of this calculation is to take the Student Body metric weightings in each site that ranks graduate programs then take the average. Ranking sites that rank graduate programs are NCR, Shanghai Rankings, QS, Graduate Programs, and Forbes. Based on table 5.1, the Student Body weights for those ranking sites are 33%, 0%, 0%, 7%, and 0%, respectively. Hence, the Student Body percent weight in Grad Only category is $(33+7)/5 = 8$ percent. Figure 5.4 shows the average metric weightings for each type of schools.

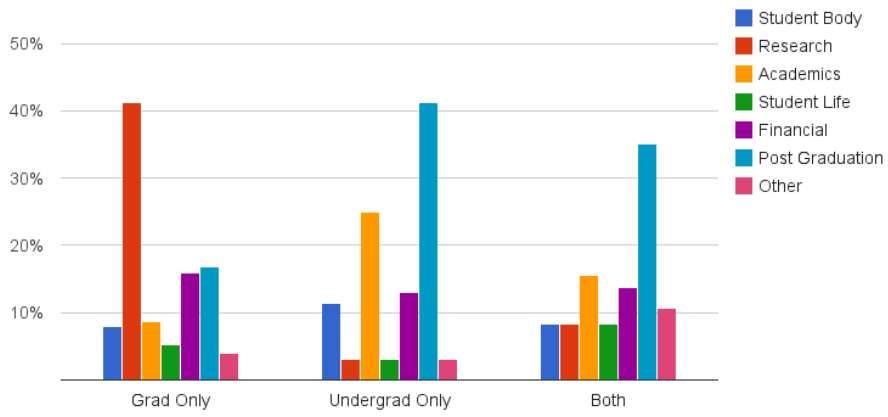

Figure 5.4: Categories vs Graduate, Undergraduate, and Both.

In Figure 5.4, it is clear that Graduate programs rankings put more weight in the Research category while Undergraduate programs rankings put more weight in Post Graduation success and Academics categories. Sites that rank Both (Graduate and Undergraduate programs) focus on Post Graduation success (35 percent) with Academics as the second most important category

(15 percent).

For Graduate programs rankings, Finance and Post Graduation success are the next two essential categories behind Research. Other categories such as Academics, Student Life, and Student Body are not quite as important.

For Undergraduate programs rankings, the next two essential categories behind Post Graduation success and Academics are Student Body and Finance. Undergraduate programs ranking seems to not care much about Research and Student Life.

5.5 Weights by College-Wide/Program-Specific Data

Almost every ranking source made exclusive used of program-specific data, as seen in Figure 5.5. In other words, they did not take into count many factors related to the college as a whole, preferring to focus on factors related to the specific programs or departments. The only exceptions were CollegeFactual, which explicitly included an "Best College Ranking" metric, and GraduatePrograms, which included the following factors: Student Diversity, Campus Safety, Social Life, Surrounding Area, Transportation, Affordability of Living.

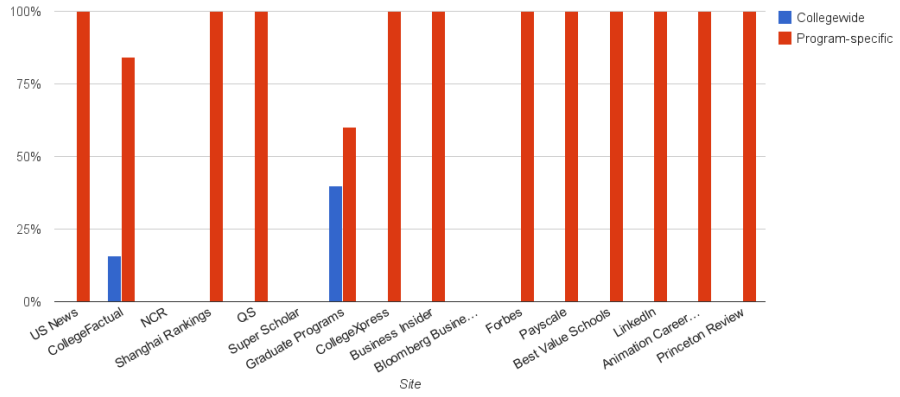

Figure 5.5: College-Wide vs. Program-Specific weights for ranking sources.

5.6 Summary

The weights allocated by ranking sites for six chosen categories are significantly different; and no ranking sites are identical. Some ranking sites such as QS and Shanghai Ranking are almost entirely focused on Research, while Payscale and LinkedIn are completely concerned with Post-Graduation Success. Other sites such as US News and collegeXpress spread weights equally.

When analyzing three types of data sources used by each ranking site, we found that many ranking sites used Objective Data (Payscale is a typical example), a few ranking sites used Expert Opinion (a typical example in this case is US News). There are three cases that used multiple sources: QS and Animation Career Review used Expert Opinion and Objective Data, Bloomberg Business Week used Expert Opinion, Objective Data, and Student Opinion sources.

It is clear that Post-Graduation success and Research are the two most essential categories for all subject areas, except for Computer Sciences where Academics is more important than Research. Graduate programs rankings consider research as the most important category while for Undergraduate program rankings, Post Graduation success and Academics are far more important than Research.

Chapter 6

Survey

6.1 Motivation

The previous section of this report detailed how ranking sources generate rankings. The next question that may be asked is how *should* they be generating rankings, and how closely do their current methods match what people are interested in? While giving any kind of absolute answer to this question is perhaps beyond the scope of this paper, we can ask an easier question: What do people actually value in college programs? The natural avenue for answering this question is through a survey.

6.2 Design

6.2.1 Goals

The survey was designed with the goal of mirroring the research on existing rankings, to be able to compare the preference of survey respondents with the reality of ranking sources. The key components of this were examination of the importance of ranking categories, the data source, and college-wide vs. program-specific criteria. It was also important to enable comparison across different subject areas, and between graduate and undergraduate programs.

A secondary goal was to enable comparison to the results of the previous project, which looked into college rankings, but not at the program level. This objective added an additional constraint of needing to keep the data in a similar format. The survey in that project used a 5-point Likert scale for

most responses, which is reflected the survey presented below.

6.2.2 Research Questions

The following research questions were created to aid the design and analysis of the survey:

1. How do attitudes differ about the importance of ranking categories across different subject areas?
2. How do attitudes differ about the importance of ranking categories across grad/undergrad as a whole?
3. How do attitudes differ about the importance of the information source (objective data, opinion of employers, etc) across subject areas?
4. How do attitudes differ about the importance of the information source across grad/undergrad as a whole?
5. How do attitudes differ about the importance of college-wide or program specific results across subject areas and grad/undergrad?
6. How do attitudes differ across academic backgrounds?

6.2.3 Distribution

The survey was distributed by email to faculty, students, and employees of Worcester Polytechnic Institute, as well as posted to /r/SampleSize, a community on Reddit "dedicated to scientific, fun, and creative surveys produced for and by redditors [16]!" Survey respondents were able to view a live results page upon completion of the survey, which displayed aggregate data of survey responses. A full copy of the survey sent out can be found in Appendix A.

6.3 Survey Breakdown

The survey was broken down into three sections: Academic Background, which established the respondents education level and their affiliation with the academic system, as well as their main subject area of interest; Program

Evaluation, which asked for their opinions on the importance of different ranking criteria; and Demographics, which asked for their age and gender.

6.3.1 Academic Background

The Academic Background section establishes the respondents education level, their affiliation with the education system, and their main subject area of interest. The question regarding affiliation with the education system loosely mirrors the previous research on data sources–objective data, and opinions of students, employers, and academics were considered in various rankings, and these options are available in this question. Respondents who answered "I am a student" were then given the ability to further clarify whether they were High School, Undergraduate, or Graduate students. There is also a question about education level completed, for demographic purposes.

An important question in this section is regarding the respondents main subject area of interest. The options reflect the subject areas that were studied in examining existing ranking sites, and the responses are carried through the rest of the survey–the later questions refer specifically to college programs in the subject area that the respondent indicated.

6.3.2 Program Evaluation

The Program Evaluation section is the most important section of the survey. Its purpose is to ascertain the respondents attitudes towards different criteria used when evaluation programs in the subject area they indicated in the previous section. For each questions, the respondent was present with a five-point Likert scale with the options Not Very Important, Somewhat Important, Moderately Important, Important, and Extremely Important.

The first set of questions asks the importance of the categories examined in the research on existing rankings, which are also the categories used by previous research. These categories are Academics, Finance, Post-Graduation Success, Research, Student Body, and Student Life. These questions were asked specifically for programs in their specified area, and there were separate questions asked about the graduate and undergraduate levels.

The second set of questions asked about the data source, asking about the importance of Objective Data, Opinion of Students, Opinion of Academics, and Opinion of Employers. These answers reflected both the breakdown of

data sources done for examining of existing rankings, and the self-identified answers earlier in the survey. This question was also asked separately for the graduate and undergraduate level.

The final two questions in this section asked about the importance of college-wide vs. program-specific criteria. This was also examined in the research into existing rankings. Again, there was a separate question for the undergraduate and graduate levels.

6.3.3 Demographics

The final section of the survey asked about the respondents gender and age. The options for gender were Male, Female, Other, and Decline. The age groups available were 0-17, 18-25, 26-40, 41+, and Decline.

6.4 Results

A "raw" version of the results can be found in Appendix B. Below is a breakdown of the results according to the research questions mentioned above.

6.4.1 Overall Results

Figure 6.1 details the survey results for the categories against the area of study when Graduate and Undergraduate programs are combined. As the figure shows, on average survey respondents viewed Academics as the most important and Student Life as the least important, with the other categories ranging in between these two extremes. Within each category, there is sometimes a significant variation by area of study. However, the trend within each area of study is at least similar to the overall trend. In the next couple sections we will discuss what each level of education, graduate and undergraduate separately to expound upon the trend visible here.

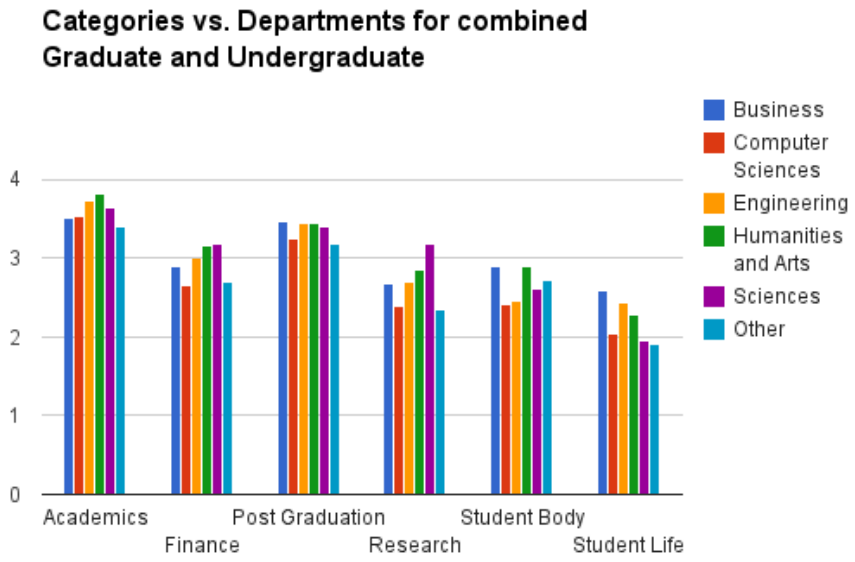

Figure 6.1: Results across combined undergraduate and graduate subject areas.

6.4.2 Category Ratings Across Subject Areas

This section answers research question 1, "How do attitudes differ about the importance of ranking categories across different subject areas?" at both the graduate and undergraduate levels.

In order to determine the average scores of the questions in which the responses were given on a Likert scale, we a took a weighted average. "Not Very Important" was given a weight of 0, "Somewhat Important" a weight of 1, "Moderately Important" a weight of 2, "Important" a weight of 3, and "Extremely Important" a weight of 4.

Undergraduate Subject Areas

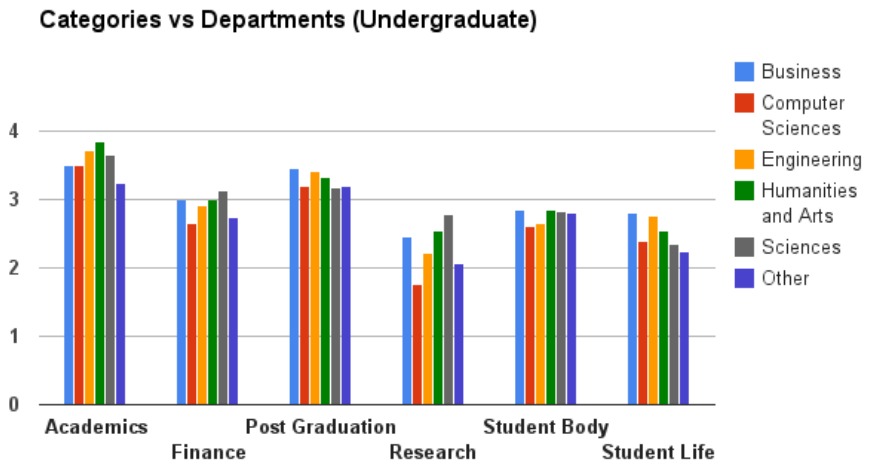

Figure 6.2: Results across undergraduate subject areas.

Figure 6.2 shows that Academics and Post-Graduation Success are the most important categories. We calculated the 95% confidence intervals for the data, and confirmed that we are at least 95% confident that Academics and Post-Graduation Success were the most important categories.

For Business Department, the 95% confident intervals for Academics and Post Graduation Success are (3.15, 3.85) and (3.11, 3.80), respectively. Both lower limits (3.15 and 3.11) are higher than the mean of other categories (Finance: 3; Research: 2.46; Student Body: 2.85; and Student Life: 2.81). Hence, we are at least 95% confident that Academic and Post Graduation Success are the most two important categories. This is also true for other departments except Sciences where Finance is also an important category; it makes sense when we look at Figure 4.1: the red and the yellow lines are almost equal in Sciences Department.

Another way to realize the importance of Academics and Post Graduation Success is to look directly at the survey results. For example: Among 26 responses in Business: Only one person thought Academics is “not very important”, exactly 9 people thought it is “important”, and 16 people though

it is “extremely important”. Only one person thought Post-Graduation Success is “not very important”, while 10 people thought it is “important”, and 15 people thought it is “extremely important”.

Among 129 responses in Engineering: Only 2 people thought Academics is “moderately important”, while 32 people thought it is “important”, and 95 people thought it is “extremely important”. Only 2 people thought Post-Graduation Success is “somewhat important”, and 15 people thought it is “moderately important”, while 41 people thoughts it is “important”, and 71 people thought it is “extremely important”.

For undergraduate programs, every area rated Academics and Post-Graduation Success as the two most important categories, and all but “Other” rated Finance as the third most important. There was more disparity at the lower end of the ratings. Note that last year IQP survey came up with the same result (Academic and Graduation Success were the most important categories.)

All areas rated Academics as the most important category. This rating seems to match expectations of undergraduate education, where more time is usually spent on classes, as opposed to research or extracurricular or non-school-related activities. “Business” had relatively less heavy focus on Academics, with more evenly distributed responses across the areas.

Post-Graduation Success was the consensus second most important area. “Sciences” and “Humanities and Arts” seemed to consider Post-Graduation Success as less important, especially in the normalized results. The responses where the respondents identified under “Computer Sciences” are a little hard to interpret for this area. In the raw mean, they were fourth in terms of its importance, but in the normalized results they were first, which means they thought it was more important relative to other categories than other subject areas did.

Finance was considered to be of fairly uniform importance across the subject areas, and was the third most important category in all of them. Sciences stood out as rating it as more important, but not by much. Student Body and Student Life were generally considered to be either the 4th or 5th most important category. Other stood out as putting an increased importance on Student Body.

Research seemed to be considered the least important category. Unsurprisingly, in Sciences Research was considered to be more important than in any other area, by a considerable margin. Interestingly, it was still only the 5th most important area, ahead of only Student Life. Computer Sciences considered Research the least important by a decent margin. This is even more

true in the results before they were normalized, because Computer Sciences respondents tended to rate everything as less important.

Graduate Subject Areas

The total mean values are somewhat varied between subject areas. To handle this issue, we normalized our data so that the total value always equal 1 for each subject area. Furthermore, by normalizing the data, we can determine the percent importance of each category. The percent important varies depending on department.

From Figure 6.3, Research is more important in Sciences compared to other departments. People involved in Business and Humanities & Art consider Student Body more important than people involved in Engineering, Computer Science, and Science. Moreover, Business considers Student Life more important than other subject areas do.

Figure 6.3 shows that Academics and Post Graduation Success are the most important categories. To make the conclusion more cogent, like with the undergraduate results, we ran statistical analysis to see if those two categories are the most important at 95% confident. The results were not quite the same with undergraduate programs.

For Business, we are at least 95% confident that Academic and Post Graduation Success are the most important categories.

For Computer Science, the 95% confident intervals for Academics and Post Graduation Success are (3.38 , 3.77) and (2.97 , 3.65). The lower limit in Post Graduation Success is 2.97 which is lower than the mean value of Research (3.02). For Computer Science and Sciences Departments, Research is also important. It makes sense since the green and yellow lines are almost equal in Sciences Department. In Computer Science, the yellow line is not much longer than the green line. Note that in Engineering, though the yellow line is not much longer than the green line but since we have many survey responses in Engineering, there is still statistical significant at 95%.

For Humanities and Arts, we are not 95% confident that Academics and Post Graduation Success are the most important categories. In this department, Finance is also a very important category. Figure 6.3 also bears this out.

For Graduate Programs, Academic and Post Graduation are the most important categories for all departments. Research is more important compared to Undergraduate Programs. It makes sense that Student Life is the

least important category, because graduates are generally less involved in on-campus activities than undergraduates.

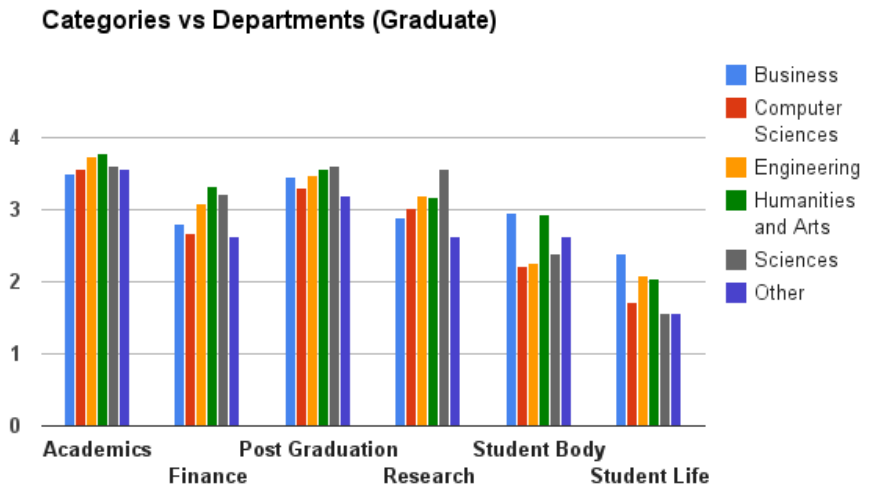

Figure 6.3: Results across graduate subject areas.

6.4.3 Information Sources

This section answers research questions 3 and 4. Question 3 asks "How do attitudes towards the importance of the ranking information sources across subject areas?" and question 4 asks "How do attitudes differ about the importance of the information source across grad/undergrad as a whole?"

Undergraduate

Figure 6.4 shows the raw aggregated survey responses for each information source as it is valued by each field. The same information has been normalized in Figure 6.5 to combat the propensity for respondents from different majors to not give the same total importance.

Those in the Humanities and Arts category seemed to prefer objective data over all other types of information source, and are close to the top in terms of how important they view objective data. Conversely, they seem to

be by far the least interested in the opinions of employers out of all fields, as well as valuing it less than all other data sources.

Respondents affiliated with Business care most about the opinions of employers, but seem to have little interest in the actual academic measures, ranking it lower than all but one other field did.

Respondents who listed Other as their field of interest seemed to have the greatest variation between the importance of different categories, although this may be due to the relatively small (14) sample size of Other respondents compared to the rest of the categories.

Student opinion seems to be on average ranked the least desirable. On the other hand, while it has the most variance. On average the opinion of employers seems to be the preferred source.

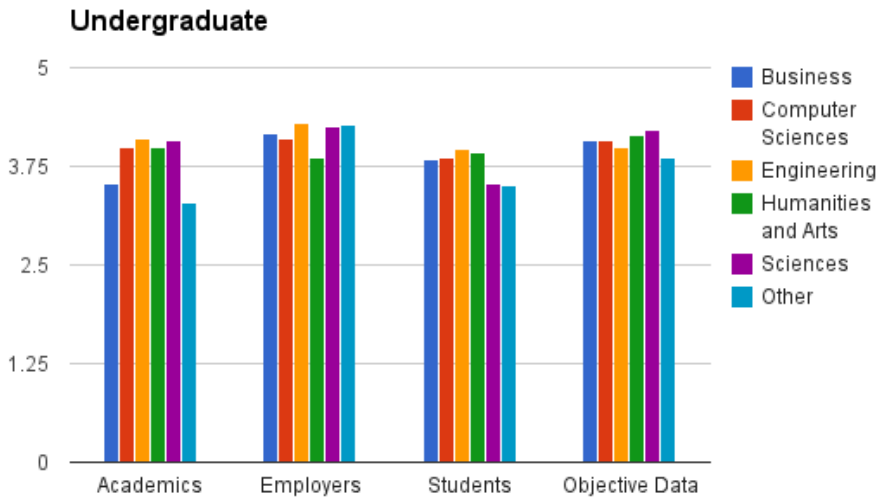

Figure 6.4: Results across undergrad subject areas.

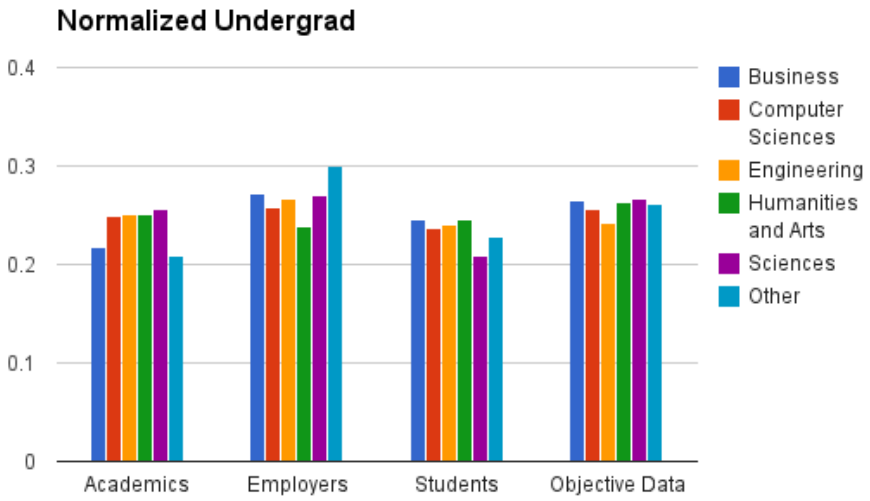

Figure 6.5: Normalized results across undergrad subject areas.

Figure 6.6 shows the raw aggregated survey responses for each information source as it is valued by each field for graduate rankings. The same information has been normalized in Figure 6.7 to combat the tendency of respondents from different majors to not give the same total importance.

Those in the Sciences category seemed to prefer Academics Opinions over all other information sources. In contrast they were least interested in the in opinions of students, and seemed to consider the other sources about equally important.

Respondents affiliated with Business care most about the opinions of employers, but seem to have little interest in the actual academic measures, ranking it lower than all but one other field did.

Student opinion seems to be on average ranked the least desirable. On the other hand, while it has the most variance, on average the opinions of employers seem to be the preferred source.

When comparing the undergraduate and graduate information sources, we see that there is more variation in the graduate, meaning that when ranking graduate programs some areas should be considered highly important,

and other less so. Oddly, where the undergraduate information sources were pretty similar across areas of study, the graduate information sources were less so. Beyond the variation, the undergraduate and graduate information sources are not very different.

Graduate

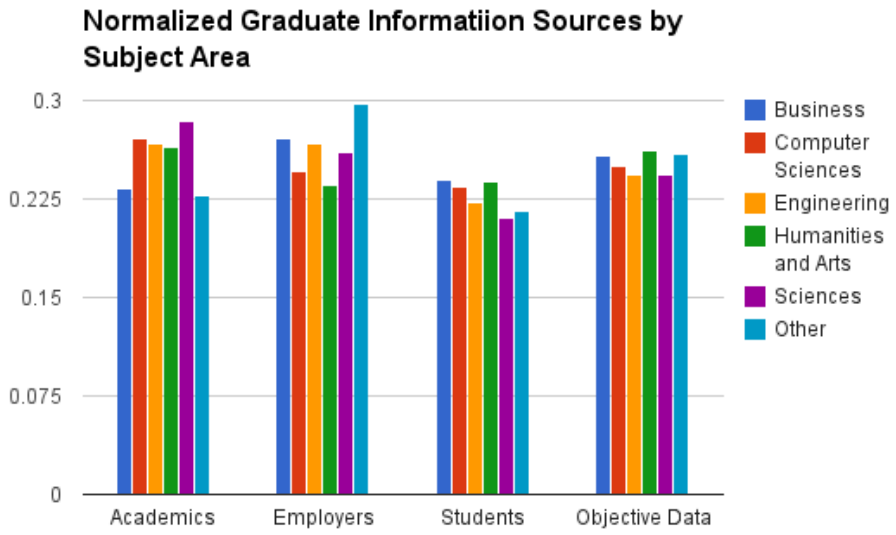

Figure 6.6: Results across grad subject areas.

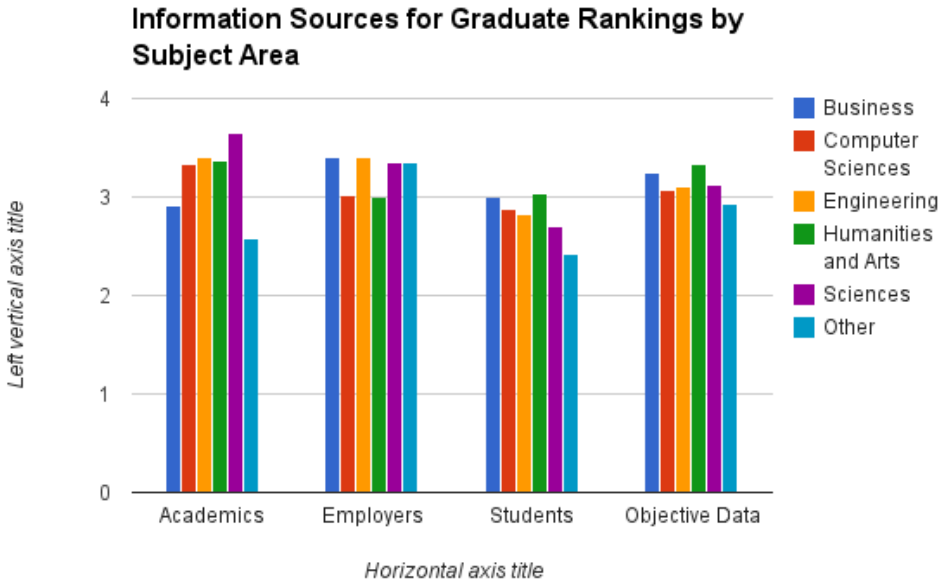

Figure 6.7: Normalized results across grad subject areas.

6.4.4 College-Wide vs. Program-Specific

Figure 6.8 is a look at the importance of ranking aspects of the overall college along with those of the specific program for the categories of study we are using by student level. Overall, survey takers believe that college-wide ranking factors were less important when evaluating graduate than when evaluating undergraduate programs. The scale ranked 0-4, with 0 as unimportant and 4 as extremely important. As can be seen from the chart the graduate program are still well in the 2-3 range, meaning fairly important to the survey takers. Other than the undergraduate being slightly higher on all categories the only significant differences are the spikes in the computer sciences and engineering categories in the undergraduate as compared to the graduate rankings.

Another important piece of Figure 6.8 we have briefly touched upon is the comparison of the different areas to each other. The differences between graduate and undergraduate rankings have already been detailed, so they are

treated as the same from here on. Most of the categories are close to the same height, which shows uniformity across all the different areas of study. The only category that outlies in both rankings is Other which is significantly lower than the rest of the categories in both graduate and undergraduate rankings.

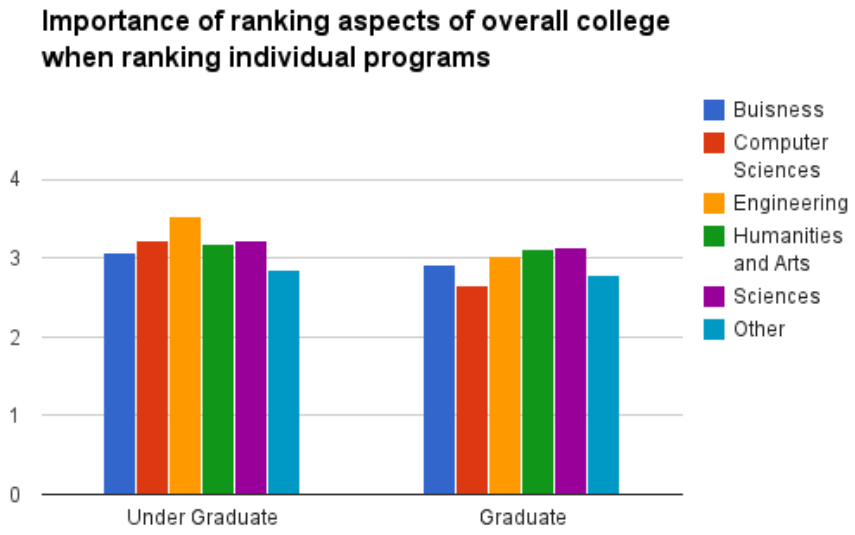

Figure 6.8: Results across subject areas.

6.4.5 Academic Backgrounds

In Figure 6.9 it is evident that the trend favoring academics continues, and this time research is the on average, the lowest ranked category. The research category is also the category with the most variation, coming from unlikely sources, as well. It is expected that those with doctorates would see research as more important because they know how much graduate studies can revolve around research, it was not expected that those with associates degrees would rank research so highly. Other than the Research category, the other category are relatively even across levels of education.

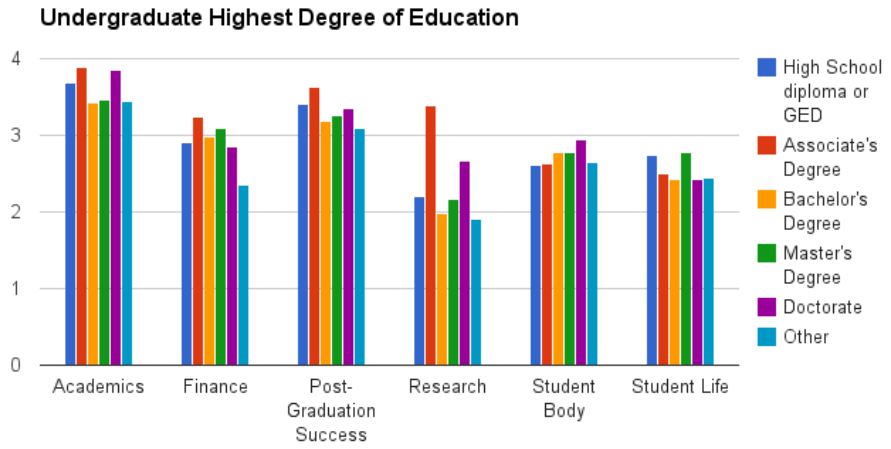

Figure 6.9: Results across undergraduate subject areas by level of education achieved

There are no such random spikes in Figure 6.10 as in Figure 6.9. On average, the categories are even across all levels of education. Academics is still the most highly important to the survey respondents. However, here the student life category is the lowest rated. The doctorate degree holders is the only level of education that really is different from the rest of the respondents. Doctorate holders put finance much lower than the other respondents and research much higher.

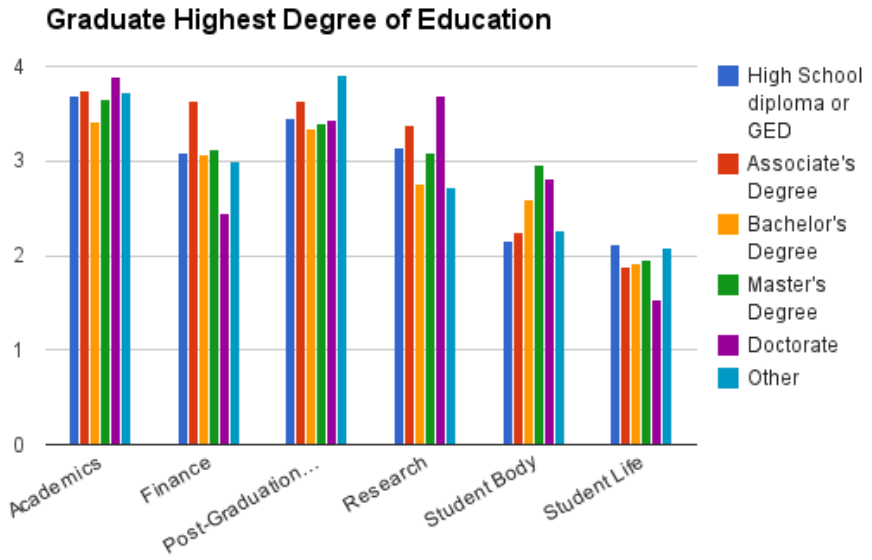

Figure 6.10: Results across graduate subject areas by level of education achieved

6.5 Summary

As can be seen from the above sections, Academics is the most important category to the survey respondents and the least important category changes by the other factors being considered.

We answered several research questions that were formed when the survey was originally formed. To summarize, Academics is the most important, Research the least for undergraduate rankings overall. For graduate programs overall rankings, Academics is most important, and Student Life least important. For undergraduate rankings information sources, Student Opinion is the least important and conversely, Employers are the most important source. Graduate program rankings seemed only say that Student Opinion was the least important. When looking at the decision to use college-wide or program-specific data, the use of college-wide factors is more popular when ranking undergraduate programs than when ranking graduate programs. The rankings based on education level continued the trend of Academics being

the most important for everyone, Research being the lowest for undergrad, with a few odd spikes, and Student Life being lowest for graduate rankings.

Chapter 7

Analysis and Comparisons

7.1 Ranking Categories

The fact that becomes apparent immediately when looking at the differences between the priorities highlighted by the survey and the average priorities of available ranking sites. The results from the survey were far more homogenized than the priorities of the ranking sites, to account for this, we compared the two by ordering their priorities.

7.1.1 Undergraduate

Business

A look at Figure 7.1 apparent that post graduation success is highly emphasized by ranking sites, but was not considered to be abnormally important by survey respondents.

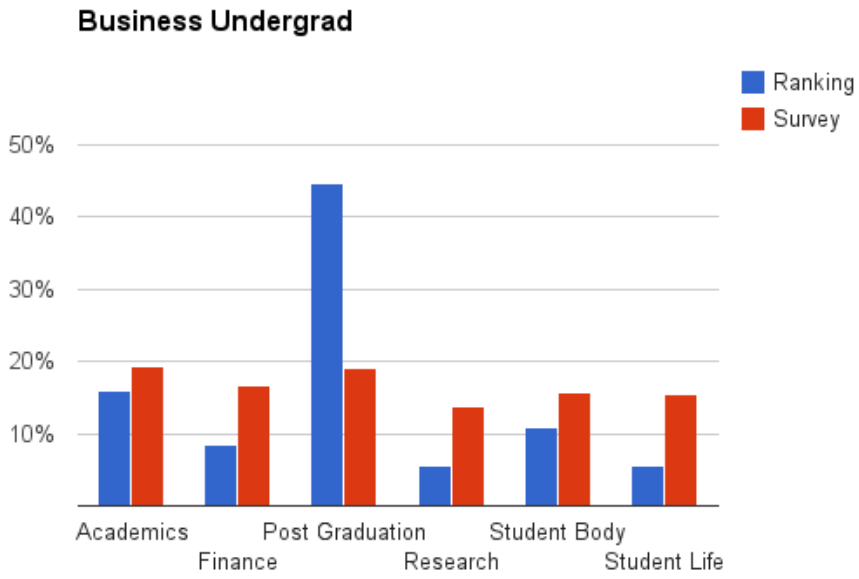

Figure 7.1: Comparison of undergraduate business rankings as they compare to the survey results

As shown in Table 7.1, The survey and available rankings are in reasonably close agreement. The top two most important categories were the same in both. The survey results had Academics and Post Graduation Success as being of about equalperformance, but the rankings used Post Graduation Success more by far. This is possibly because it is arguably easier to measure with objective data, which rankings favor .The third and fourth most important categories in both were Finance and Student Body, though in opposite orders. Student Life and Research were the least important in both.

Computer Sciences

In Computer Sciences, the results were ultimately almost identical to Business, with slightly different numbers. This again shows fairly close agreement.

Table 7.1: Business ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Post Graduation
2	Post Graduation	Academics
3	Finance	Student Body
4	Student Body	Finance
5	Student Life	Student Life/Research
6	Research	Student Life/Research

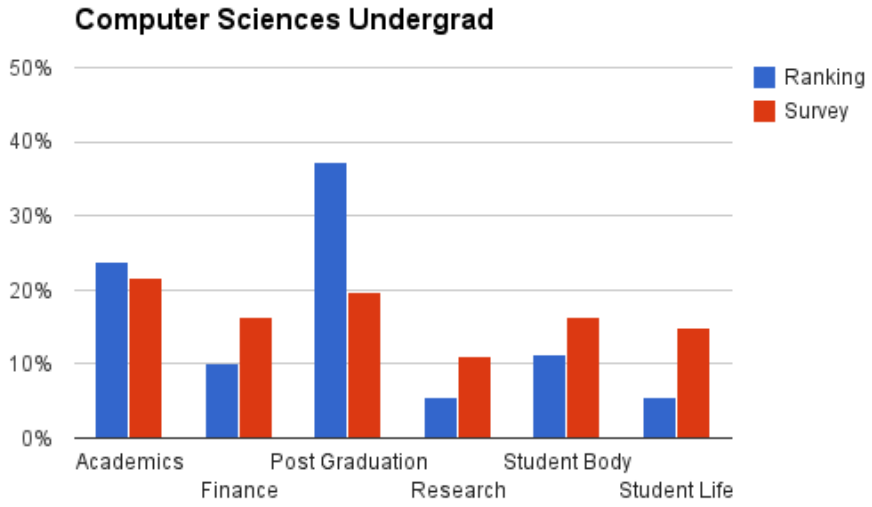

Figure 7.2: Comparison of undergraduate computer science rankings as they compare to the survey results

Table 7.2: Computer Science ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Post Graduation
2	Post Graduation	Academics
3	Finance	Student Body
4	Student Body	Finance
5	Student Life	Student Life/Research
6	Research	Student Life/Research

Engineering

In Engineering, the rankings sources focused more on Finance overall, which led to increased disagreement. Academics fell to third in the rankings, while remaining the most important in the survey. Post Graduation Success was still clearly the most important. Engineering survey respondents considered Student Life to be slightly more important than in other areas, putting it above Student Body, which disagrees with the rankings.

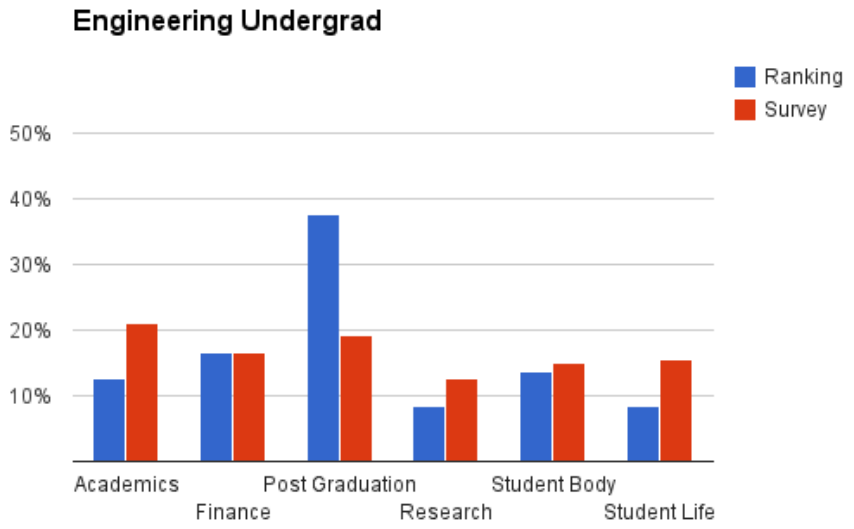

Figure 7.3: Comparison of undergraduate Engineering rankings as they compare to the survey results

Table 7.3: Engineering ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Post Graduation
2	Post Graduation	Finance
3	Finance	Academics
4	Student Life	Student Body
5	Student Body	Student Life/Research
6	Research	Student Life/Research

Humanities and Arts

Humanities and Arts has the closest agreement so far, with the only discrepancy being 1st and 2nd and the 3rd and 4th most important both being

flipped. They even both had exact ties for last between Student Life and Research.

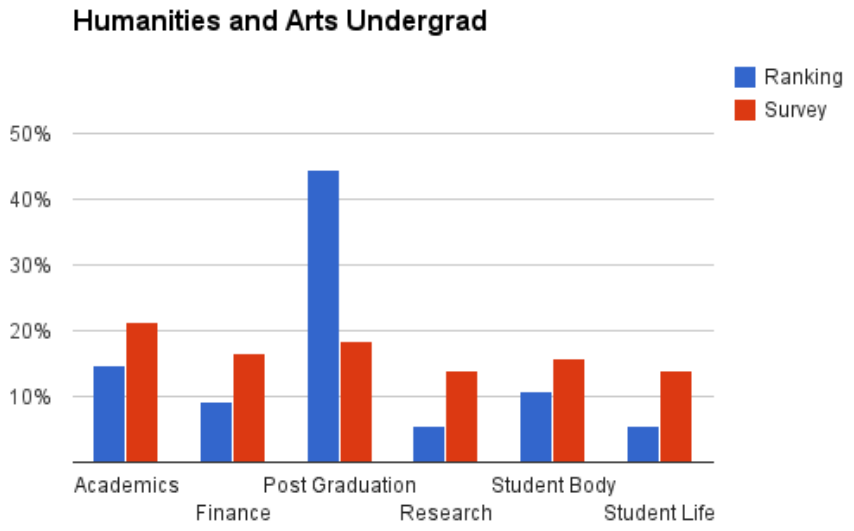

Figure 7.4: Comparison of undergraduate Humanities and Arts rankings as they compare to the survey results

Table 7.4: Humanities and Arts ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Post Graduation
2	Post Graduation	Academics
3	Finance	Student Body
4	Student Body	Finance
5	Student Life/Research	Student Life/Research
6	Student Life/Research	Student Life/Research

Science

Sciences had probably the worst agreement. Student Body was suddenly considered the second most important in the rankings, while Finance fell to being tied for 4th/last. Academics, which were most important in the survey, were only the third most important in the rankings.

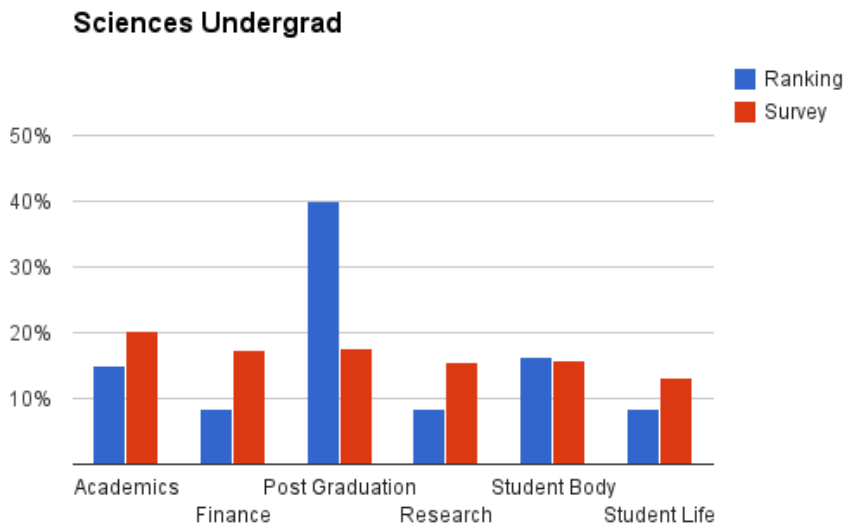

Figure 7.5: Comparison of undergraduate Science rankings as they compare to the survey results

Table 7.5: Science ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Post Graduation
2	Post Graduation	Student Body
3	Finance	Academics
4	Student Body	Student Life/Research/Finance
5	Research	Student Life/Research/Finance
6	Student Life	Student Life/Research/Finance

7.1.2 Graduate

The ranking systems distribution of weights among the six categories: Academics, Finance, Post Graduation, Research, Student Body, and Student Life were not a strong fit with the survey results. Ranking systems (for all departments) placed too much weight in Research category.

Business

The survey indicates that Academics are significantly more important to Business grad students than ranking sites assume, with a three place discrepancy out of six potential places. The survey also indicates that ranking sites are discounting evaluating Business programs' Student Body related factors, with the Student Body category also being displaced by three places.

Table 7.6: Business ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Post Graduation
2	Post graduation	Research
3	Student Body	Finance
4	Research	Academics
5	Finance	Student Life
6	Student Life	Student Body

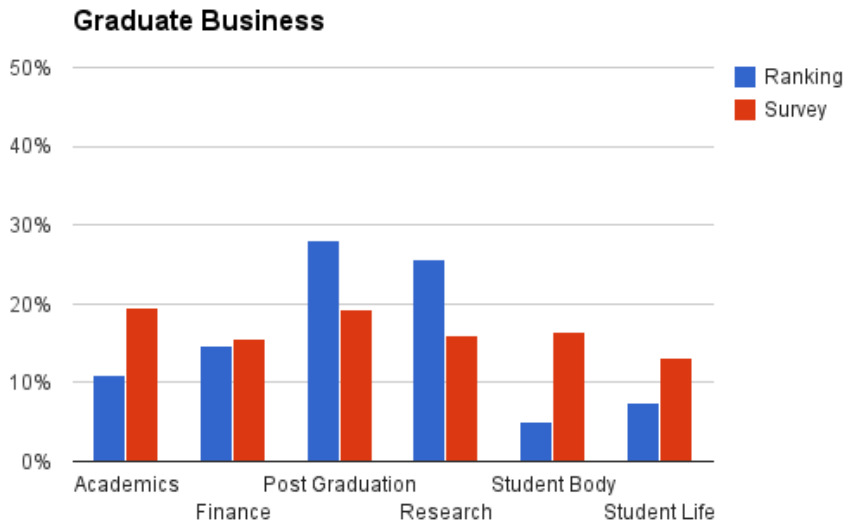

Figure 7.6: Comparison of graduate Business rankings as they compare to the survey results

Computer Science

The Survey results for graduate Computer Science align much more with the CS ranking sites, than the Business. However, Ranking Systems should decrease the weight of Research category and increase the weight of others categories (except Student Life which is strong fit).

Table 7.7: Computer Science ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Research
2	Post Graduation	Academics
3	Research	Post Graduation
4	Finance	Finance
5	Student Body	Student Life
6	Student Life	Student Body

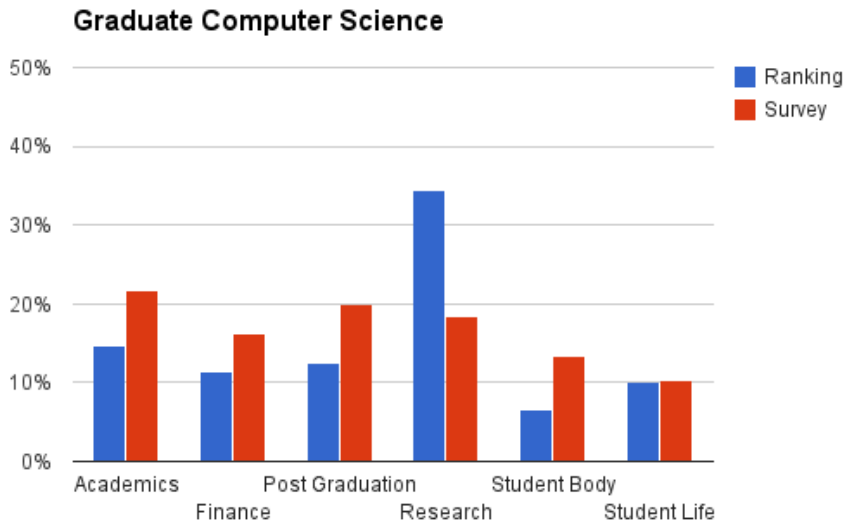

Figure 7.7: Comparison of graduate Computer Sciences rankings as they compare to the survey results

Engineering

The survey results suggests that ranking systems should increase the weight of Academics, Finance, and Post Graduation categories while decreasing Research categorys weight.

Table 7.8: Engineering ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Research
2	Post Graduation	Academics
3	Research	Student Body
4	Finance	Post Graduation
5	Student Body	Finance
6	Student life	Student Life

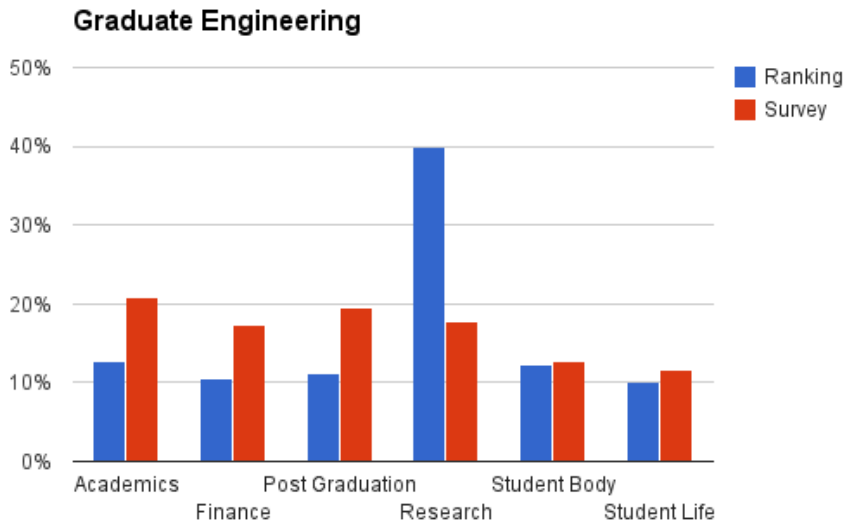

Figure 7.8: Comparison of graduate Engineering rankings as they compare to the survey results

Humanities and Arts

For Humanities and Arts, not only the weight of Academics and Finance need to be increased but the weights of Student Body and Student Life categories need to be increased also.

Table 7.9: Humanities and Arts ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics	Research
2	Post Graduation	Post Graduation
3	Finance	Academics
4	Research	Finance
5	Student Body	Student Body
6	Student Life	Student Life

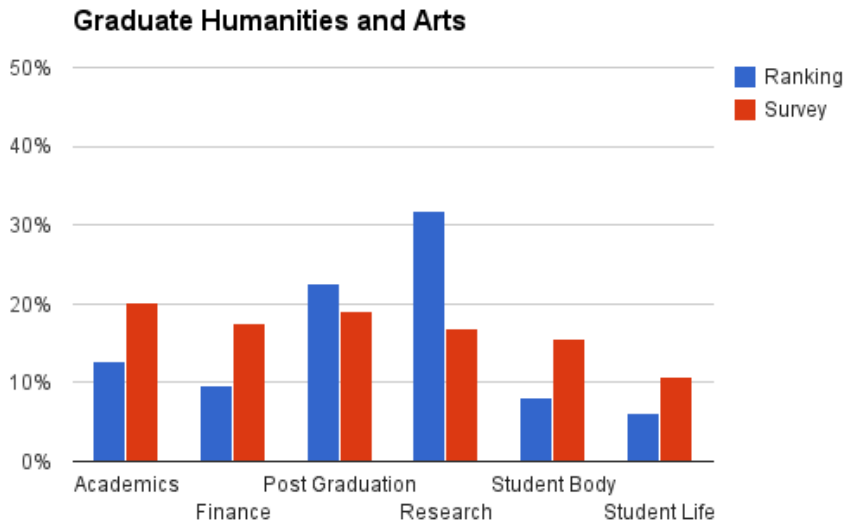

Figure 7.9: Comparison of graduate Humanities and Arts rankings as they compare to the survey results

Sciences

Ranking Systems should decrease the weight of Research category and increase the weight of others categories (except Student Life which both agree is not very important).

Table 7.10: Science ranking categories in order of priority.

Rank	Survey	Rankings
1	Academics/Post Graduation	Research
2	Academics/Post Graduation	Academics
3	Research	Student Body
4	Finance	Post Graduation
5	Student Body	Finance
6	Student Life	Student Life

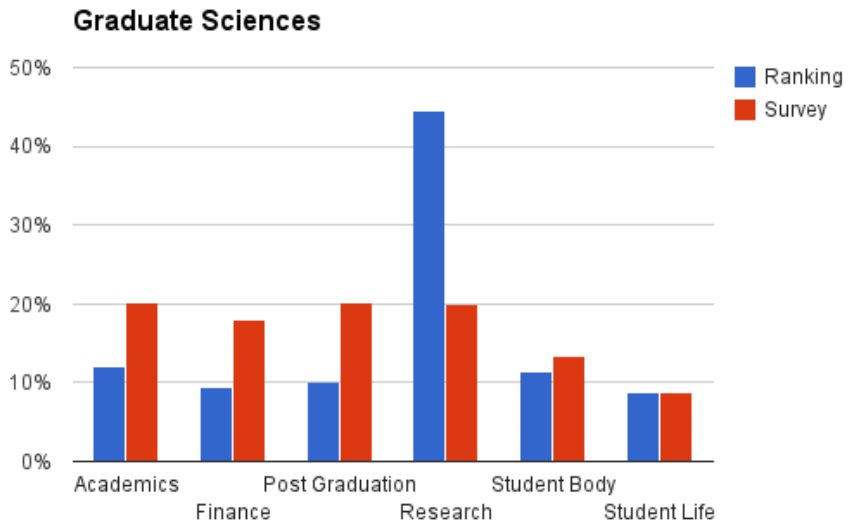

Figure 7.10: Comparison of graduate Sciences rankings as they compare to the survey results

7.1.3 Overall

The opinions about the importance of different factors in ranking programs seem to be similar between different programs, so it makes sense to look at overall trends in the incongruities between the survey responses and the general trends of ranking sites for both the graduate and undergraduate levels. The first thing to note in Figure 7.11 is that graduate rankings put significantly more stock in research than any other category, whereas undergraduate rankings put a significant amount of stock in Post Graduation Success, while the survey respondents for both graduate and undergraduate programs cared the most about academics and second most about post graduation success. The graduate ranking sites are all putting significantly more stock in Research than there is call for. Both undergraduate and graduate rankings put too little stock in Academics relative to the amount they put into Research. It is interesting to note that the graduate survey results and undergraduate survey results are very similar in the importance of Aca-

demics, Post Graduation, and Finance; yet they differ greatly between the graduate ranking sites and undergraduate ranking sites.

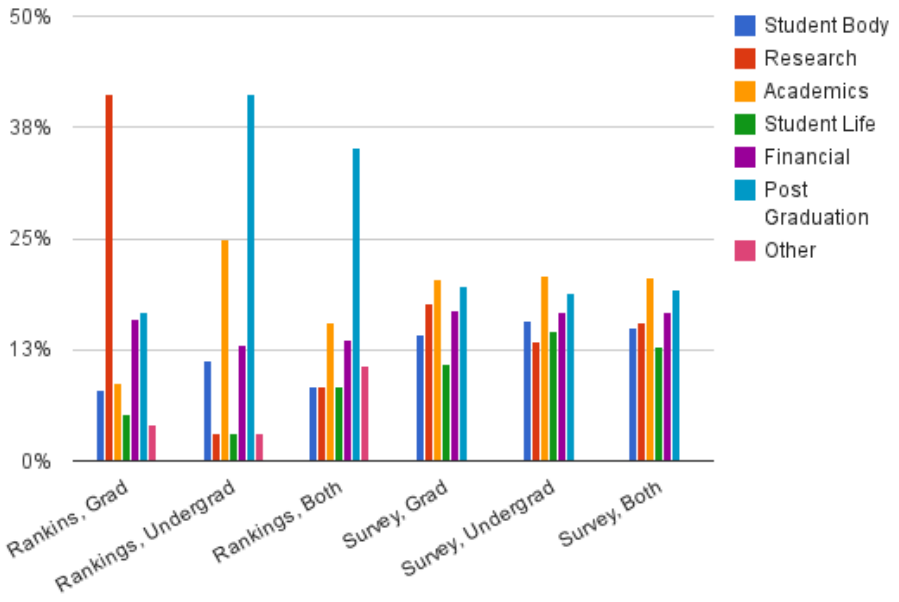

Figure 7.11: Comparison between ranking sites and survey results - Categories vs Graduate, Undergraduate, and Both.

7.2 Data Sources

7.2.1 Undergraduate

In Figure 7.12 the weights used by the ranking sites are averaged to show which data sources are more commonly used. It is evident that Student Opinion was used much less than either of the other two other data sources. Objective Data was much more used than Expert opinion. This shows that the ranking sites saw expert opinion and objective data as the only data sources of real importance.

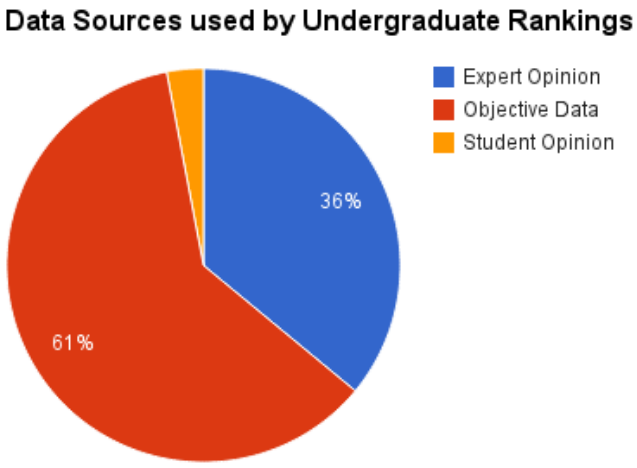

Figure 7.12: Weights of each data source used by undergraduate program ranking sites.

The data that is represented in Table 7.11 shows the average response of the survey respondents. For the survey, we had split "Expert Opinion" into "Opinion of Academics" and "Opinion of Employers." We observed that there was a distinction between the opinion of academics and of 'opinion of employers while analyzing the ranking systems, and split it up in the survey to see if the distinction mattered to the survey takers.

Table 7.11 shows that the "Opinion of Employers" was the most highly rated by the survey respondents. "Objective Data" is the next highest ranked, followed closely by "Opinion of Academics," and the "Opinion of Students" was ranked the lowest. This does not match well with Figure 7.12, the only similarity is that "Student Opinion" is at the bottom of the list. Even so, "Student Opinion" saw very little use in ranking sites, while in survey responses it did not lag far beyond the other sources. The "Opinion of Academics" was more important to survey respondents than "Objective Data," so there was a clear mismatch between the preference of survey respondents and actual usage of data sources in ranking sites.

Table 7.11: Survey results for preferred undergraduate data sources.

Data Source	Average Response
Opinion of Academics	2.96
Opinion of Employers	3.2
Opinion of Students	2.86
Objective Data	3.04

7.2.2 Graduate

Figure 7.13 shows the usage of the data sources of graduate program ranking sites. As can be seen, as with the results for undergraduates, "Student Opinion" is used the least, but it is used more than it was used for the undergraduate rankings. "Expert Opinion" is also used more than in undergraduate rankings. Overall the "Objective Data" is once again the mostly highly used.

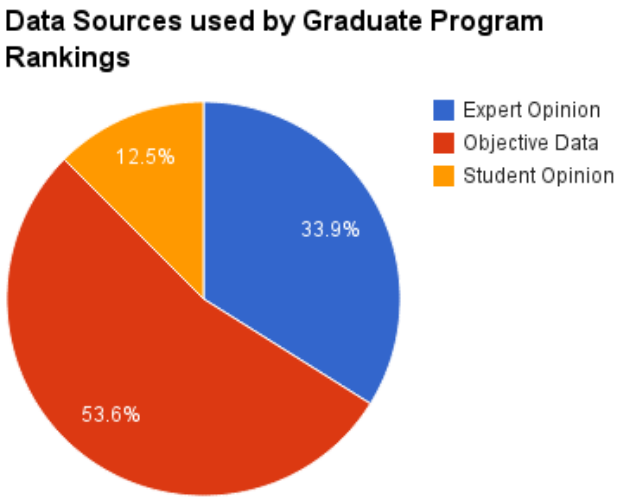

Figure 7.13: Weights of each data source used by graduate program ranking sites.

Table 7.12 shows the survey's respondents ratings of the data sources used. As can be seen, "Student Opinion" is by far the lowest rated of the data sources, which matches the ranking systems and the undergraduate rankings. However, the "Opinion of Academics" and the "Opinion of Employers" were rated as being more important than "Objective Data." As with undergraduate programs, there is a mismatch as to which data sources are the most important.

7.2.3 Summary

For both graduate and undergraduate programs, survey respondents thought that some form of expert opinion was more important than "Objective Data," which was the primary type of data source used by ranking sites. One might consider that this discrepancy exists because "Objective Data" is easier to obtain than data based on opinion polls. Therefore, one might expect that bigger ranking services would focus more on expert opinions. There is some evidence for this: US News, the most popular ranking in the US [17], *exclusively* uses expert opinions, specifically the opinions of academics [19]. However, the survey results suggests that even US News uses the *wrong* type of expert opinion when ranking undergraduate programs, as survey respondents considered the opinion of *employers* and not academics be the most important. In fact, only Business Insider used some form of employer opinion as the primary source for their ranking. Overall, it looks like ranking services should be considering expert opinions more highly, especially the opinions of employers.

Table 7.12: Survey results for preferred graduate data sources.

Data Source	Average Response
Opinion of Academics	3.32
Opinion of Employers	3.29
Opinion of Students	2.84
Objective Data	3.13

7.3 Program-Specific/College-Wide

Figure 5.5 showed that almost all program ranking sources use exclusively program-specific data. The survey results suggest that this may not be a good thing, especially for undergraduate ranking sources. The average response for undergraduates regarding the importance of college-wide ranking factors was a 3.32, which on the survey falls somewhere between "Important" and "Extremely Important." This suggests that the overall quality of the institution *is* an important consideration for undergraduates. According to the National Center for Education Statistics, 80% of undergraduates change their major at least once, and on average change their majors at least three times [18]. Therefore, it seems very sensible for undergraduates to consider the overall quality of the institution when selecting a program.

Survey respondents considered college-wide factors to be less important for graduate programs, but the overall result was still 2.95, which corresponds to slightly less than "Important," but is still well above "moderately important." This suggests that it still might be worthwhile for ranking sites to place higher importance on college-wide factors.

Table 7.13: Survey results for importance college-wide ranking factors.

Level	Average Response
Undergraduate	3.32
Graduate	2.95

7.4 Comparison to Past Results

Because the prior IQP did not look at rankings with respect to individual programs, it is impossible to draw a one-to-one comparison without losing some data. The previous IQP found that their survey respondents favored in order: Academics, Post-Graduation Success, and Finance. This is backed by the fact that the new survey found the same results across all programs.

The previous IQP ranked fewer ranking sites, and divided them into international rankings and US only rankings. In this case, it seems reasonable to just compare the US only rankings from the previous IQP, since this project mostly focused on US-centric ranking sites. The most common popular rankings among the ranking sites that this paper covered were

Post-Graduation Success, Academics, and Student Body. Interestingly, the previous IQP found that they were ordered Post-Graduation Success, Academics, and Finance. This may have something to do with the small sample size of American ranking sites covered by the previous IQP.

7.5 Summary

The ranking sites distribution of weights among the six categories: Academics, Finance, Post Graduation, Research, Student Body, and Student Life were incongruous with the survey results. With respect to graduate programs, ranking sites placed too much weight in the Research category. With respect to undergraduate programs, ranking sites placed too much weight in the Post Graduation success category.

Rankings for both undergraduate and graduate programs placed the most weight in "Objective Data" (around 50-60 percent) while based on survey results, "Opinion of Employers" is most important for ranking undergraduate programs, and the "Opinion of Academics" is most important for ranking graduate programs. Overall, the data suggests that ranking sites should consider expert opinions more highly, especially the opinions of employers.

Ranking sites did not seem to place enough importance in college-wide ranking factors, especially for undergraduate programs.

Chapter 8

Conclusions

8.1 Future Work

Research has been done for college rankings and program rankings at both undergraduate and graduate levels. Future research might expand further to analyze rankings of high schools, community colleges, and online schools.

In our survey, most of respondents were from the WPI community, especially Computer Science and Mechanical Engineering Departments. To be better representative of the population, any future survey should expand beyond the WPI community. In addition, this future survey might ask people to rank six categories by percent importance in which the total percentage should be equal 100. By asking these types of questions, one could compare peoples ideas directly to available ranking systems. The future survey might figure out what are the most popular ranking systems; once the most popular ranking systems are known, studies can be focused more on those ranking systems.

8.2 Summary

Based on the analysis of ranking sites performed in this paper, it is apparent that ranking sites overall consider Research to be the most important category for ranking graduate programs and Post-Graduation Success the most important for ranking undergraduate programs. Ranking sites seem to value Objective Data significantly more than they do expert or student opinions. Almost all of the program ranking sites did not consider factors related to

the overall quality of the school. There were some notable differences in the importance of ranking factors across subject areas, such as an increased focus on Research in the sciences, and an increased focus on Post-Graduation Success in business program rankings.

Survey respondents viewed Academics and Post-Graduation Success as the most important ranking categories for both graduate and undergraduate program rankings. They viewed expert opinion as the most valuable data source, with employer opinions being the most important for undergraduate programs and academics opinions being the most important for graduate programs. College-wide ranking factors were considered to be of significant importance, especially for undergraduate programs. There was surprisingly little variation in survey responses across subject areas.

When comparing the survey results to the analysis of existing ranking sites, a number of discrepancies were obvious. Ranking sites for graduate programs put too much emphasis on research, while for undergraduate programs they put too much emphasis on Post-Graduation Success. For both sections, it seems that placing a greater emphasis on expert opinions is preferable, while less of an emphasis should be placed on objective data. In particular, survey respondents valued employer opinions highly, which is not reflected in any program rankings. Finally, survey respondents considered the overall quality of the institution to be an important consideration when evaluating programs, which few ranking sites considered.

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Appendix A

Full-Text of Survey

Starting on next page.

WPI

Introduction

We are completing a project studying the characteristics of various college program rankings that are available. These rankings attempt to compare the quality of specific programs at a college or university against similar programs at other schools. In this survey, we will ask you several questions about your opinion on various criteria that are used by these rankings. At the end of survey you will be redirected to a live results page where you can view the aggregate responses of the survey-takers so far.

Academic Background

Select what best describes you:

- ○ I am a student.
- ○ I am involved in academia professionally.
- ○ I am an employer.
- ○ I am an employee but not directly involved in hiring.
- ○ I am none of the above.

Which kind of student are you?

- ○ High School Student
- ○ Undergraduate Student
- ○ Graduate Student
- ○ None of the Above

What is the highest level of education you have completed?

- ○ High School diploma or GED
- ○ Associate's Degree
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ Doctorate
- ○ Other

Which general area do you have the most interest or involvement in?

- ○ Business
- ○ Computer Sciences
- ○ Engineering
- ○ Humanities and Arts
- ○ Sciences
- ○ Other

Program Evaluation

How important are the following categories when evaluating undergraduate college programs in ${q://QID7/ChoiceGroup/SelectedChoicesTextEntry}?

	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important
Academics - Overall academic quality of the program					
Finance - Affordability/Value of the program					
Post-Graduation Success - Success of students after completion of the program					
Research - The quality of the research output of the program					
Student Body - Quality of the student body					
Student Life - Quality of student life outside of classes					

How important are the following categories when evaluating graduate college programs in ${q://QID7/ChoiceGroup/SelectedChoicesTextEntry}?

	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important
Academics - Overall academic quality of the program					
Finance - Affordability/Value of the program					
Post-Graduation Success - Success of students after completion of the program					
Research - The quality of the research output of the program					
Student Body - Quality of the student body					
Student Life - Quality of student life outside of classes					

How important are the following when evaluating undergraduate college programs in ${q://QID7/ChoiceGroup/SelectedChoicesTextEntry}?

	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important
Opinion of Academics					
Opinion of Employers					
Opinion of Students					
Objective Data					

How important are the following when evaluating graduate college programs in ${q://QID7/ChoiceGroup/SelectedChoicesTextEntry}?

	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important
Opinion of Academics					
Opinion of Employers					
Opinion of Students					
Objective Data					

How important are characteristics of the overall college/university when evaluating college programs in ${q://QID7/ChoiceGroup/SelectedChoicesTextEntry} at the:

	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important
Undergraduate Level					
Graduate Level					

Demographics

What gender do you identify with?

- Male
- Female
- Other
- Decline

How old are you?

- 0-17
- 18-25
- 26-40
- 41+
- Decline

Thank You

Thank you for your response! Please hit the ">>" button below to submit your survey responses. You will be redirected to a live results page where you can view the aggregate responses of the survey-takers so far.

Appendix B

Raw results from Survey

Table B.1: Raw answers to Question 1

1. Select what best describes you	Total Responses	Percentage
I am a student	282	66
I am involved in academia professionally.	71	17
I am an employer.	7	2
I am none of the above.	15	3
I am an employee but not directly involved in hiring.	55	15
Total	430	100

Table B.2: Raw answers to Question 2

2. Which Kind of Student are you?	Total Responses	Percentage
High School Student	26	10
Undergraduate Student	208	79
Graduate Student	29	11
None of the above.	0	0
Total	263	100

Table B.3: Raw answers to Question 3

3. What is the highest level of education you have completed?	Total Responses	Percentage
High School diploma or GED	204	50
Associate's Degree	15	4
Bachelor's Degree	77	19
Master's Degree	44	11
Doctorate	46	11
Other	19	5
Total	405	100

Responses to Other:
will get my bachelors at the end of this term
J.D.
high school w/some college credits
Some graduate program studies
currently in high school
middle school?
None, still in HS
In high school
Completed 11th Grade
JD, MBAF, MSCS
None/Middle School
Finishing High School in June
still in high school
I am currently taking high school classes at a college
None
still in highschool
Sophomore year
None

Table B.4: Raw answers to Question 4

4. Which general area do you have the most interest or involvement in?	Total Responses	Percentage
Business	44	11
Computer Sciences	68	17
Engineering	180	44
Humanities and Arts	41	10
Sciences	38	9
Other	34	8
Total	405	100

Responses to Other:
All
language acquisition
higher education administration
Career Services
Mathematics
health care systems
Finance
Social Science
Legal
Marketing
Student Affairs
administrative services
facilities
Marketing
Library
Athletics
Social Sciences
Library and Information Technology
social science
Politics/Government
I'm a lawyer
Agriculture
Graphic Design
Health Profession
Social Science
No idea

Table B.5: Raw answers to Question 5

5. How important are the following categories when evaluating undergraduate college programs in your chosen field of interest?	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important	Total	Mean
Academics - Overall academic quality of the program	4	1	3	72	192	272	4.64
Finance - Affordability/Value of the program	10	11	53	116	82	272	3.92
Post-Graduation Success - Success of students after completion of the program	4	7	24	95	142	272	4.34
Research - The quality of the research output of the program	37	39	69	74	53	272	3.25
Student Body - Quality of the student body	6	25	68	117	56	272	3.71
Student Life - Quality of student life outside of classes	12	22	79	102	57	272	3.63

Table B.6: Raw answers to Question 6

6. How important are the following categories when evaluating graduate college programs in your chosen field of interest?	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important	Total	Mean
Academics - Overall academic quality of the program	3	1	7	63	198	272	4.66
Finance - Affordability/Value of the program	11	15	39	101	106	272	4.01
Post-Graduation Success - Success of students after completion of the program	5	6	25	61	175	272	4.45
Research - The quality of the research output of the program	13	18	26	80	5135	272	4.13
Student Body - Quality of the student body	15	46	73	89	49	272	3.41
Student Life - Quality of student life outside of classes	41	48	94	56	33	272	2.97

Table B.7: Raw answers to Question 7

7. How important are the following when evaluating undergraduate college programs in your chosen field of interest?	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important	Total	Mean
Opinion of Academics	11	15	29	109	83	247	3.96
Opinion of Employers	7	10	24	92	114	247	4.2
Opinion of Students	6	15	50	112	64	247	3.86
Objective Data	6	6	37	121	77	247	4.04

Table B.8: Raw answers to Question 8

8. How important are the following when evaluating graduate college programs in your chosen field of interest?	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important	Total	Mean
Opinion of Academics	8	5	21	79	134	247	4.32
Opinion of Employers	3	6	33	80	125	247	4.29
Opinion of Students	6	18	51	106	66	247	3.84
Objective Data	5	6	36	104	96	247	4.13

Table B.9: Raw answers to Question 9

9. How important are characteristics of the overall college/university when evaluating college programs in your chosen field of interest at the:	Not Very Important	Somewhat Important	Moderately Important	Important	Extremely Important	Total	Mean
Undergraduate Level	4	4	17	104	118	247	4.33
Graduate Level	11	15	36	95	89	246	3.96

Table B.10: Raw answers to Question 10

10. What gender do you identify with?	Total Responses	Percentage
Male	144	59
Female	97	40
Other	2	1
Decline	2	1
Total	245	100

Table B.11: Raw answers to Question 11

11. How old are you?	Total Responses	Percentage
0-17	6	2
18-25	152	62
26-40	29	12
41+	55	22
Decline	3	1
Total	245	100