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The Skills Marketing Majors Believe They Acquire: Evidence From a National Survey

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Abstract

Drawing from a panel survey of over 400,000 college graduates from over 600 different colleges and universities in the United States, this article addresses three questions related to skill change during college tenure. First, as judged by the students themselves, how much change in 15 skill categories do marketing majors experience during college? Second, how do these skill changes compare with those reported by other business majors and college students from all other majors? Finally, controlling for a host of relevant student and institutional characteristics, what is the impact of marketing education on the changes reported for each of these 15 skills? Findings indicate that marketing students' perceptions of their own skill developments are generally very positive, but in some cases other business majors or the broader array of college students rated themselves more favorably. Taken in combination with employers' contrasting perceptions of graduates' workforce readiness, these results have implications for the improvement of marketing curricula and course design including greater emphasis on experiential learning and other opportunities for students to apply the knowledge they gain.

Keywords

marketing, marketing major, marketing education, business education, perceived skill change, perceived skill acquisition, self-efficacy, experiential learning, curriculum development

A wide range of skills is required of those who work in marketing. This is particularly true considering the huge variety of tasks and responsibilities that fall under the umbrella of the marketing function. Prior research shows that employers are dissatisfied with the skill sets that new graduates from the marketing discipline possess (Bacon, 2017). As a result, further study has been dedicated to better understanding in which skills graduates are more or less prepared for the professional environment.

While other perspectives have been considered, comparisons of students' self-ratings are underrepresented in the research that has been conducted to this point. Recognizing the value of indirect measures of student learning, the Association to Advance Collegiate Schools of Business accepts ratings such as self-report measures as supplements to the more objective, direct measures the accrediting body continues to emphasize (AACSB International, 2013). Though indirect measures are not new, this shift suggests a need for greater scrutiny of the ratings. Hence, one opportunity for knowledge development is in understanding how students from different programs of study compare with one another with regard to the skill developments they report. In addition, students' perceptions of their own abilities are important to study for the fact that these perceptions reflect students' confidence in their own abilities. This confidence, which could otherwise be thought of as feelings of self-efficacy, will tend to influence the career choices students make such as deciding for which jobs they should apply (Solberg, Good, Fischer, Brown, & Nord, 1995). These decisions will, in turn, have a great deal of impact on the individual's career path and trajectory. Helping students find a path or trajectory that leads them to a successful career could be seen as an important goal for higher education. Last, objective measures of many of the students' skills (e.g., Leadership Ability or Interpersonal Skills) reported on here are not, to the authors' knowledge, readily available especially for large, national student samples.

Therefore, the primary interest in this study is to examine how marketing majors feel their skills have changed during their college tenure. Using a panel survey of over 400,000 college graduates from over 600 different colleges and universities in the United States, the authors attempt to answer questions related to subjective beliefs of skill change and knowledge development during college. The research

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questions explored here are threefold. First, as judged by marketing majors themselves, how much have their various skills and areas of knowledge (hereafter collectively referred to as "skills" for brevity) changed as a result of their higher education? The data allow for examination of 15 unique skills in this regard such as Critical Thinking, Public Speaking, Reading Speed and Comprehension, and Computer Skills. These absolute changes are important, but their relativity may impart even more information. Therefore, the second question is, how do these skill changes compare with those reported by other students? Because marketing majors accrue skills during the business core curriculum, they are compared with two separate peer groups, business majors who were not marketing majors and nonbusiness majors. The average characteristics and collegiate experiences are thought, or in many cases have been shown in prior research, to vary across major of study (Hammock, Routon, & Walker, 2016). Thus, multivariate techniques which control for these relevant differences are used to address the final research question: what is the estimated impact of a marketing degree on perceived changes in each of the 15 skill categories?

Literature Review

A substantial amount of scholarly work has examined the outcomes of marketing education. Some individuals complain that marketing majors are among the poorest performing students relative to other business majors, both coming into and leaving college (Aggarwal, Vaidyanathan, & Rochford, 2007). Part of the criticism may come from low levels of skills previously discussed here in addition to a lack of quantitative skills that are required in most business jobs (Tarasi, Wilson, Puri, & Divine, 2012). Nonetheless, skills learned in marketing courses help students obtain positions when they are actively participating in a job search (Barr & Mcneilly, 2002; McCorkle, Alexander, Reardon, & Kling, 2003).

Perception of the specific skills necessary for marketing employees varies by stakeholder. Previous findings routinely show that employers are most concerned with critical thinking and communication skills (Hart Research Associates, 2015). The perception of activities that contribute to the skills needed to perform well in a marketing job also varies by the evaluator (Finch, Nadeau, & O'Reilly, 2013; Kelley & Gaedeke, 1990). In sales, activities such as objective assessment, technical skills, experiential learning, acquired skills, college accomplishments, and extracurricular activities were valued as more important to sales managers, while sales representatives saw basic skills, educational experiences, and interactive skills as more important (Raymond, Carlson, & Hopkins, 2006).

According to job market statistics and survey results about marketing and business student's job search process, some of the abilities that are highly valued by today's employers have been in high demand for several years. Developing communication, presentation, and teamwork skills, for instance, is still encouraged by the faculty, preferred by employers of new hires over specific knowledge of the marketing function (Gaedeke, Tootelian, & Schaffer, 1983; Remington, Guidry, Budden, & Tanner, 2000; Taylor, 2003;), and acknowledged by students as important (Hite, Bellizzi, & McKinley, 1987).

Across the range of marketing activities, the gap between marketing skills needed in the labor force and the ones developed in higher education is a key topic in academia (Bacon, 2017). This gap is constantly changing, as the body of knowledge required to perform at all levels and in every position is very dynamic (Schlee & Harich, 2010; Schlee & Karns, 2017). Academics are continuously evaluating if the skills needed in industry are coordinated with the concepts covered in a marketing degree (Ang, D'Alessandro, & Winzar, 2014). For instance, Turley and Shannon (1999) show that marketing majors lack foreign language knowledge in greater proportion than nonmarketing majors do. More recently, Wright and Larsen (2016) found that although employers see writing as an essential skill, many marketing graduates perform poorly in this subject. Again, recent graduates' abilities do not appear to align well with the skills employers look for in new hires.

Even though there is a clear difference between actual and perceived learning (Bacon, 2016), the present study's main interest focuses on student's self-perception of their skill set. In this context, the subjective gauge of perceived learning may be seen as an indication of self-efficacy rather than a measure of the skills students actually gain. Self-efficacy has been associated with antecedents including mentoring, instructor feedback, and overall experience with a given task (Bouffard-Bouchard, 1990; Jain, Chaudhary, & Jain, 2016; Judge, Jackson, Shaw, Scott, & Rich, 2007). Beyond these relationships, self-efficacy has been linked to task performance in a number of specific contexts (Barling & Beattie, 1983; Judge et al., 2007; Tims, Bakker, & Derks, 2013). Hence, the examination of students' perceived skill gains is seen as relevant to job readiness.

Stemming from this line of reasoning, this article details efforts to address three research questions. They are as follows:

Research Question 1: How do marketing majors perceive their skills to have changed over the course of their undergraduate education?
Research Question 2: How do the perceived skill gains of marketing majors compare with those of other business majors and other majors in general?
Research Question 3: Accounting for other relevant factors, how much does the pursuit of a marketing major affect perceived skill gains?

The procedures and analyses employed to assess these questions are described in the following sections.

Methodology

Data used in this analysis come from the Higher Education Research Institute (HERI), which runs the Cooperative Institutional Research Program (CIRP) housed at The University of California, Los Angeles. Among others, the CIRP administers two surveys known as The Freshman Survey (TFS) and the College Senior Survey (CSS; HERI, 2017). The TFS is administered very near a student's matriculation, most often as an entrance survey, while the CSS is administered very near graduation, most often as an exit survey as part of the student's exit exams. All data on students who took both of these surveys that was freely available at the time of writing were collected and merged for the analyses described here. This merged data set includes a large number of American undergraduate students of higher education who earned their bachelor's degree between 1994 and 2006. Those with interest in HERI and the data they have collected and offer publicly are directed to online service (https://heri.ucla.edu/).

Previous studies have utilized the TFS and CSS data to understand standing and progression of attitudes and behavior in college. Most of these studies focus on the science, technology, engineering, and mathematics majors (Brown, Halpin, & Halpin, 2015; Chang, Sharkness, Hurtado, & Newman, 2014; Kim & Sax, 2014), and only a few articles focus in business and economics majors (e.g., Hammock et al., 2016). This research seeks to add to the sparse literature in this area through the use of such data.

Sample

Specifically, the working panel from which this data are drawn is composed of 442,250 students from 619 different institutions of higher education in the United States. One hundred percent of these students are college graduates, otherwise they would not have been administered the CSS. While rich, these data are not without limitations. Notably, only 24% of the students in the sample attended a university (an institution which additionally grants graduate degrees), while the remainder attended a college (those which only grant bachelor's [4-year] degrees). More important, 79% attended a private institution, as these colleges and universities more often participate in the CIRP than do public institutions. Thus, while the sample is quite large, it cannot necessarily be thought nationally representative in these two regards. Last, the authors note that, by design, these surveys capture no postgraduation information, and as in most any multivariate data set, additional variables exist which would have warranted examination had they been available through further survey.

Absolute and Relative Perceived Skill Change for Marketing Majors

Of primary interest here are responses to a set of questions asked of students on the CSS, that is, very near their graduation date: How do you feel your skills in (skill category) have changed during your college tenure? Students could respond to each of these questions with one of five options: "much weaker," "weaker," "no change," "stronger," and "much stronger." In very select cases, the CIRP has inquired about other skill categories, but there are 15 which have been persistently captured throughout the lifespan of the CSS: Getting Along With Dissimilar People; Critical Thinking; Working Cooperatively; Analytical and Problem Solving Skills; Computer Skills; Foreign Languages; General Knowledge; Interpersonal Skills; Knowledge of Your Field; Knowledge of Other Races and Cultures; Leadership Ability; Mathematical Skills; Public Speaking; Reading Speed and Comprehension; and Writing Skills.

Perceived Skill Change Impacts of a Marketing Degree

Multivariate techniques generate direct estimates of the impact of a marketing education on perceived skill change. Specifically, the models estimated take the form

$$\Delta y_{i,s,t} = \alpha + \beta Marketing_i + \gamma \boldsymbol{C}_i + \delta \boldsymbol{X}_i + \lambda y_{i,s,t-4} + S_s + T_t + \epsilon_{i,s,t}$$

where $\Delta y_{i,s,t}$ is student i's change in one of the 15 skills captured through these surveys; α a constant term; $Marketing_i$ an indicator for marketing majors, with β its corresponding coefficient; $\boldsymbol{C}_i$ a vector of variables describing students' other collegiate experiences, with γ its corresponding vector of coefficients; $\boldsymbol{X}_i$ a vector of individual-specific control variables, with δ its corresponding vector of coefficients; $y_{i,s,t-4}$ students' skill levels at matriculation, with λ the corresponding vector of coefficients; S_s school fixed effects; T_t time (graduating year) fixed effects; and $\epsilon_{i,s,t}$ the usual error term. Here, β, the estimated average impact of a marketing education on change in the skill in question, is of particular interest.

Controlling for differences across students ($\boldsymbol{X}_i$) and their nonmajor collegiate experiences ($\boldsymbol{C}_i$) helps ensure the estimated impacts of a marketing education are not biased by these confounding factors. Controlling for matriculating skill levels ($y_{i,s,t-4}$) is arguably even more important, since a student with very high skills has less potential for growth, for example. The inclusion of time fixed effects (T_t) allows for control of time-specific heterogeneity, such as any national trends in education or specifically the field of marketing during the sample period. School fixed effects (S_s) facilitate control for heterogeneity at the school level, including all time-invariant institutional characteristics (e.g., relative size, location, public/private status, and mission). For those unfamiliar and with interest in fixed effect methodology, the authors direct the reader to Wooldridge (2010), Kennedy (2008), Angrist and Pischke (2008), or most any advanced

Table 1. Reported Skill Changes of Graduating Marketing Majors.

Rank	Skill category	Percentages reporting respective skill changes				
		Much weaker	Weaker	No change	Stronger	Much stronger
1	Knowledge of Your Field	0.1	0.2	2.9	38.4	58.4
2	General Knowledge	0.2	0.3	2.3	50.4	46.9
3	Computer Skills	0.2	0.4	8.3	48.7	42.4
4	Interpersonal Skills	0.1	0.8	9.4	51.8	37.8
5	Public Speaking	0.2	1.1	11.1	50.1	37.5
6	Critical Thinking	0.1	0.4	7.2	57.5	34.8
7	Analytics and Problem Solving	0.1	0.4	6.5	59.7	33.2
8	Working Cooperatively	0.0	0.4	13.8	53.7	32.1
9	Leadership Ability	0.2	1.2	16.0	52.1	30.6
10	Writing Skills	0.2	1.7	13.8	58.6	25.7
11	Getting Along With Dissimilar People	0.4	1.0	38.5	38.7	21.3
12	Cultural and Racial Knowledge	0.6	2.5	32.6	46.7	17.5
13	Reading Speed and Comprehension	0.1	1.2	29.5	55.1	14.2
14	Mathematics	0.7	6.4	37.2	46.1	9.7
15	Foreign Languages	4.5	13.8	51.9	21.9	8.0

Note. Number of marketing majors = 11,609. Number of schools in survey = 619. The skill categories are ranked, from high to low, by the percentages of students reporting "much stronger."

statistics textbook, particularly those focusing on panel data statistics.

The skill change variables may be thought of as increasing ordinal indices with five values, one for "much weaker" through five for "much stronger." Therefore, the estimated models of the above equation are generated with ordered logistic regression, the regression technique specifically designed for use with ordinal dependent variables. For those unfamiliar and with interest in ordered logistic regression, the authors direct them to Borooah (2002), Long (1997), Wooldridge (2010), or most any statistics text dealing with categorical and ordinal data. The estimates from 30 total models of the above equation, 2 versions for each of the 15 skills investigated, are presented below. The first version of each draws from the full sample. Estimates from this version may therefore be interpreted as the estimated average impact of a marketing education, when marketing majors are compared with all other college graduates. In each case, the second version draws from a subsample of business majors. Estimates from the second version may therefore be interpreted as the estimated average impact of a marketing education, when marketing majors are compared with business students not fielding in marketing. Both sets of estimates are needed to fully understand the skill impacts of a marketing education. In all 30 models, the standard errors are clustered at the school level for additional institution-level control.

Results

This section spells out the findings of the analyses underlying this research. First, the raw data are described in greater detail. Next, the first two research questions are addressed without consideration for any of the control variables aforementioned by way of a series of chi-square tests. Then, these two questions are more rigorously assessed through the use of ordered logistic regression. Finally, the third research question is addressed using the same ordered logistic regression models.

Of the 442,250 students surveyed, 11,609 majored in marketing. As a direct response to Research Question 1, Table 1 presents the percentages of marketing majors who chose each response option for each of the 15 skill categories. Overall, marketing students had a very positive view of their own skill development over the course of their undergraduate studies. In 14 of the 15 skill areas, the majority of students surveyed deemed their skills to be either "stronger" or "much stronger." In only one area, Foreign Languages, did the majority of students report less than positive development. Even in this case, only 18.3% assessed their skills to be weaker or much weaker. Over half indicated No Change for the skill area. Furthermore, a proportion of 80% or more of respondents selected one of the two positive ratings for 10 of the skill areas. The exceptions to this were Getting Along With Dissimilar People, Cultural and Racial Knowledge, Reading Speed and Comprehension, Mathematics, and Foreign Languages. The highest rated category was Knowledge of Your Field in which a majority, 58.4%, said they had become "much stronger" and an additional 38.4% selected "stronger." This was followed by General Knowledge at 46.9% and 50.4% for the responses. Hence, the results of the survey are encouraging with regard to marketing education's impact on students' perceptions of their own skill developments.

Table 2. Proportional Differences in Students Reporting "Much Stronger" Skills.

Rank	Skill category	Phi	Major		
			MKTG	Other business minus MKTG	Not business minus MKTG
1	Public Speaking	0.05	37.5	−9.3*	−13.1*
2	Working Cooperatively	0.04	32.1	−7.1*	−11.7*
3	Leadership Ability	0.04	30.6	−4.1*	−6.5*
4	Computer Skills	0.03	42.4	−3.0*	−10.9*
5	Interpersonal Skills	0.03	37.8	−5.8*	−7.2*
6	Mathematics	0.03	9.7	+3.5*	+2.7*
7	Foreign Languages	0.02	8.0	+1.2*	+3.1*
8	Writing Skills	0.02	25.7	−2.0*	+3.6*
9	Knowledge of Your Field	0.01	58.4	−3.4*	+6.5*
10	General Knowledge	0.01	46.9	−2.0*	+1.2
11	Getting Along With Dissimilar People	0.01	21.3	−1.4*	−2.1*
12	Cultural and Racial Knowledge	0.01	17.5	+0.0	+2.6*
13	Critical Thinking	0.01	34.8	−2.4*	+3.9*
14	Analytics and Problem Solving	0.01	33.2	−0.5	+1.1
15	Reading Speed and Comprehension	0.01	14.2	+0.2	+2.0*
Observations			11,609	56,481	374,160

Note. MKTG = marketing. Number of schools in survey = 619. Data come from the Cooperative Institutional Research Program. The skill categories are ranked, from high to low, by effect size (Cramér's Phi). Other values are "Percentages of students." Asterisks refer to *p* values from chi-square statistical hypothesis tests of response distribution equality across marketing majors and the designated student sample, *$p < .01$. In all five cases without asterisks, we fail to reject the null hypothesis at the 90% level, $p > .1$.

Digging a little deeper, some of the skills that seem most important to success in the business world, and more specifically, the marketing field show very good ratings. For example, Interpersonal Skills, Public Speaking, and Working Cooperatively show 89.6%, 87.6%, and 85.8% selecting "stronger" or "much stronger." Interestingly, some of the other skills for marketing also show very good results. In particular, over 92% chose one of these two options for Analytics and Problem Solving and Critical Thinking, while Computer Skills logs 91.1%. In addition, Writing Skills and Leadership Ability registers 84.3% and 82.7% in the positive choices. Still for some of the skill categories, the proportions of marketing students reporting No Change are higher than one might expect. For instance, Getting Along With Dissimilar People and Cultural and Racial Knowledge, skill areas that would seem critical to marketing practice, are designated not to have changed as a result of college study by 38.5% and 32.6% of marketing students, respectively.

As expressed in Research Question 2, it is not the absolute levels of skill change, but their relative levels, that may impart the most information. Table 2 presents the percentages of marketing majors that report "much stronger" skills in each of the 15 categories as well as estimates of the differences in the proportions of other business students and nonbusiness majors who reported "much stronger" command of each skill area. For those who wish to make very quick comparisons, differences with positive (negative) signs indicate when the proportion is larger (smaller) than that of marketing majors. The authors choose to make primary comparisons around the response category of "much stronger" since, from an educational standpoint, it is the ideal answer. It is worth noting, however, that examination of students who report their skills have improved at all during college (responses of "stronger" *or* "much stronger") yield similar results.

In comparison with other business majors, more marketing students report "much stronger" skill improvement for 10 skill areas, with nonsignificant differences in the proportions for Analytics and Problem Solving, Cultural and Racial Knowledge, and Reading Speed and Comprehension. Marketing majors showed smaller proportions for only two areas—Mathematics and Foreign Languages. With regard to nonbusiness majors, marketing students do not compare quite as favorably. In this comparison, marketing majors indicate "much stronger" skills in greater proportions for only six skill areas—Computer Skills, Interpersonal Skills, Public Speaking, Working Cooperatively, Leadership Ability, and Getting Along With Dissimilar People. Higher proportions of nonbusiness majors rate their skill change as "much stronger" with regard to Knowledge of Your Field, Critical Thinking, Writing Skills, Cultural and Racial Knowledge, Reading Speed and Comprehension, Mathematics, and Foreign Languages. Proportional differences between marketing majors and nonbusiness students were not statistically significant in the skill areas of General Knowledge and Analytics and Problem Solving.

These findings would seem to generally reflect well on marketing education, especially in relation to other business majors. Some of the areas that are most germane to marketing

Table 3. Summary Statistics of Individual-Level Control Variables.

Continuous and index variables	*M*	*SD*	Min.	Max.
High school GPA	3.371	0.267	1	4
College GPA	3.241	0.465	1	4
Self-rated academic ability	3.962	0.707	1	5
Age at matriculation	18.206	1.035	16	55
Father's years of schooling	15.386	2.869	0	20
Mother's years of schooling	15.038	2.597	0	20
Combined parental income (2016 USD)	112690.800	52501.169	0	366,100
Distance from home (miles)	140.629	165.479	5	500
Number of colleges applied to	4.110	1.894	1	12
Hours/week devoted to student clubs	1.555	3.331	0	20
Indicator variables	**Relative frequency**		**Min.**	**Max.**
Took one or more remedial courses	0.071		0	1
Failed one or more courses	0.093		0	1
Male	0.375		0	1
African American	0.063		0	1
Hispanic	0.034		0	1
Other non-White race	0.101		0	1
Not a native English speaker	0.076		0	1
Two-parent household	0.885		0	1
First generation college student	0.094		0	1
Full-time job during college	0.429		0	1
Part-time job during college	0.230		0	1
Part-time student	0.061		0	1
International student	0.012		0	1
Wanted graduate degree at matriculation	0.358		0	1
Wants graduate degree at graduation	0.222		0	1
Joined fraternity or sorority	0.168		0	1
Played intercollegiate sports	0.113		0	1
Frequently studied with other students	0.406		0	1
Student office (club, student government, etc.)	0.073		0	1
Leadership class(es) and/or training	0.179		0	1
Internship participant	0.028		0	1

Note. Observations = 442,250.

practice, Interpersonal Skills, Public Speaking, and Working Cooperatively, are areas in which marketing students feel they grew "much stronger" in greater proportions than other business majors *and* nonbusiness majors. Thus, the emphasis in cross-functionality in the marketing curriculum that has been encouraged for decades (Crittenden & Wilson, 2006) could be seen as affirmation of effective training for future marketers. However, categories for which the opposite is true, Reading Speed and Comprehension, Mathematics, and Foreign Languages, may be cause for concern. Last, the fact that a greater percentage of marketing students report "much stronger" skill in Computer Skills and Leadership Ability, two areas that may not be seen as particularly critical parts of marketing curricula, is perhaps surprising.

Research Question 3 calls for the estimation of the impact of marketing education on students' skill development. As a starting point for this analysis, Table 3 presents summary statistics for the control variables in $\boldsymbol{X}_i$ and $\boldsymbol{C}_i$. Importantly, there are several variables which allow for holding students' academic prowess constant: high school grade point average (GPA), college GPA, remedial course participation, the presence of one or more failing grades, and the student's self-rated academic ability on a 5-point scale. Also included are general demographics: gender, race (four categories, omitted category White), age, and whether English is a first language. This last variable is particularly important here, since reading and writing skill change are two of the outcomes analyzed. Household characteristic variables included are an indicator for a two-parent household, each parent's education level, an indicator for first-generation college students, and combined parental (real) income. Since these surveys come from multiple years, incomes from each survey

Table 4. Key Regression Results, Comparing Marketing to All Other Majors.

Rank	Skill category	Stronger skills	Much stronger skills	Partitioned R^2
1	Public Speaking	0.1	12.0***	.16
2	Working Cooperatively	0.3	10.3***	.12
3	Computer Skills	−1.7***	9.4***	.15
4	Interpersonal Skills	−1.7***	6.8***	.02
5	Leadership Ability	3.4***	5.7***	.02
6	Getting Along With Dissimilar People	0.4	1.2***	.01
7	General Knowledge	1.2**	0.6	.01
8	Analytics and Problem Solving	3.1***	0.6	.03
9	Reading Speed and Comprehension	0.3	−2.4***	.03
10	Cultural and Racial Knowledge	−0.9*	−2.6***	.02
11	Critical Thinking	−3.9***	−2.9***	.02
12	Mathematics	−8.7***	−3.1***	.18
13	Writing Skills	−4.8***	−3.2***	.07
14	Foreign Languages	−3.0***	−3.5***	.07
15	Knowledge of Your Field	−3.5***	−3.5***	.08

Note. N = 442,250. Marginal impacts reported here are percentage point differences between marketing and other majors. The skills are ranked in descending order by the impact on a student reporting "much stronger" skills.
*p < .10. **p < .05. ***p < .01.

year were first adjusted for inflation by transforming them all into 2016 dollars. The remaining variables in this table, which may be thought "college experience" variables, are distance between the institution and the student's prior home; the number of colleges applied to; and typical hours per week devoted to student clubs and organizations. Furthermore, the table includes indicator variables for students who held a full-time job, held a part-time job, attended part-time, are international students, those wanting a graduate degree at each matriculation and graduation, those who joined a fraternity or sorority, intercollegiate athletes, those reporting they frequently studied with others, student office holders, those who took a leadership course(s) and/or training, and internship participants. Students with different collegiate experiences will have varying opportunities for skill growth during college tenure. Controlling for differences in experiences allows more accurate estimation of the skill impacts of a marketing education.

Estimated models originally included additional individual-level control variables beyond those reported here. All 31 of the student-specific control variables listed in Table 3 are included in all final models presented here. Each of these was discovered to be a statistically significant determinant of skill change in over half of the 30 final models. The original set included four additional variables which were found to be statistically insignificant determinants in almost all cases and therefore ultimately omitted from the analysis. These were binary indicators for student tutors, intramural sports participants, transfer students, and those who became married during college tenure. The reported estimated impacts of a marketing degree are robust to included controls. That is, no individual control variable or set of controls (e.g., general demographics, precollege characteristics, or collegiate experiences) once dropped changes the sign or statistical significance of the impact of a marketing degree. The time and school fixed effects also proved important in the determination of reported skill change. In addition to achieving more efficient estimates of the impacts of a marketing education, another reason for the relatively high level of control used in this analysis is sample size. The student panel's large size puts upward pressure on the probability of a statistically significant estimated impact of marketing education. A higher level of control helps keep this pressure in check. Additional information, effect sizes, or descriptive statistics on the student-specific control variables are available from the authors on request. These data are available in their raw form from the HERI.

Key results from all 30 models are presented in Tables 4 and 5. Values here are estimated impacts expressed as percentage points calculated from β, with associated standard errors listed in the next column of the table. Here, positive (negative) values imply a marketing education increases (decreases) a student's probability of reporting a positive change in the skill in question relative to other students. For example, the value of 9.4 for "much stronger" skill development in Computer Skills in the third row of Table 4 reflects the estimate that marketing majors are 9.4 percentage points more likely than all other students to report "much stronger" Computer Skills. In contrast, the percentage point impact value of −3.9 estimated for "stronger" development in Critical Thinking implies that a student majoring in marketing is 3.9 percentage points *less* likely than other college students to report "stronger" skills in that skill category. Going forward, "percentage points" will be abbreviated "pp."

Table 5. Key Regression Results, Comparing Marketing to Other Business Majors.

Rank	Skill category	Stronger skills	Much stronger skills	Partitioned R^2
1	Public Speaking	−3.1***	9.5***	.16
2	Working Cooperatively	−3.0***	7.1***	.15
3	Interpersonal Skills	−3.4***	5.9***	.02
4	Leadership Ability	0.1	4.4***	.03
5	Knowledge of Your Field	2.8***	3.3***	.13
6	Computer Skills	0.9	3.0***	.15
7	Critical Thinking	1.4***	2.5***	.02
8	General Knowledge	1.6***	2.1***	.03
9	Writing Skills	0.1	2.0***	.07
10	Getting Along With Dissimilar people	2.1***	1.5***	.01
11	Analytics and Problem Solving	0.2	0.6	.04
12	Cultural and Racial Knowledge	−0.1	−0.1	.02
13	Reading Speed and Comprehension	−1.3**	−0.2	.04
14	Foreign Languages	0.2	−1.3***	.17
15	Mathematics	−3.9***	−3.4***	.19

Note. N = 442,250. Marginal impact reported here are percentage point differences between marketing and other majors. The skills are ranked in descending order by the impact on a student reporting "much stronger" skills.
*p < .10. **p < .05. ***p < .01.

Marketing students are not found to be significantly different from the broader group of college students with regard to the skill changes they reported in the areas of General Knowledge, and Analytics and Problem Solving. In some of the skill areas identified as particularly relevant to marketing previously in this text, Public Speaking and Working Cooperatively, marketing students are 12.0 pp and 10.3 pp more likely to perceive themselves as "much stronger." Similar positive results are found for Computer Skills (9.4 pp), Interpersonal Skills (6.8 pp), Leadership Ability (5.7 pp), and Getting Along With Dissimilar People (1.2 pp). Significant discrepancies in the negative direction are found for Reading Speed and Comprehension (−2.4 pp), Cultural and Racial Knowledge (−2.6 pp), Critical Thinking (−2.9 pp), Mathematics (−3.1 pp), Writing Skills (−3.2 pp), Foreign Languages (−3.5 pp), and Knowledge of Your Field (−3.5 pp). Table 5 presents the regression results for the comparison of marketing students with other business majors.

In comparison with other business majors, marketing majors fail to show significant differences in the skill development they log for Analytics and Problem Solving and Cultural and Racial Knowledge. Looking at the skill categories in which marketing students do report significantly different changes, the students are more likely to report "much stronger" skills in all but Foreign Languages (−1.3 pp) and Mathematics (−3.4 pp). While some of the positive differences are relatively modest with Getting Along With Dissimilar People at 1.5 pp and Analytics and Problem Solving at 2.0 pp, some are considerably larger with Leadership Ability, Interpersonal Skills, and Working Cooperatively all registering above 4.0 pp. The largest discrepancy is once again exhibited in the area of Public Speaking skills, reflecting a 9.5 pp greater likelihood of marketing majors reporting "much stronger" skills in that category.

Partitioned R^2s for major choice are also presented in the Tables 4 and 5. Using the typical rules of thumb (Cohen, 1992), the estimated impacts on public speaking, working cooperatively, computer skills, and mathematics may be thought "medium" in size (Table 4). When comparing marketing majors only with other business majors, foreign languages and field knowledge may be added to this list (Table 5). In all other skill cases, the typical rules of thumb would classify the estimated impact as small. In zero cases may the impact be thought relatively large.

Comparisons between marketing students and all others yield more mixed results (Aggarwal et al., 2007). One might characterize the areas in which marketing students compare most favorably with the overall sample of college students as encompassing collaborative skills along with the perhaps surprising addition of Computer Skills. On the other hand, the areas in which the spectrum of other college majors seems to generate better reports of skill improvement than does the marketing major might be thought of as a reflection of breadth of knowledge gained.

Regarding Research Question 3, comparisons of the impact of majoring in marketing with the other individual-level variables listed in Table 3 indicate that the choice of major is relatively important. Notably, three variables are found to be more important than a student's choice of major in all 15 skill cases, regardless of whether one is examining effect sizes (Phi) or controlling for other factors by examining estimated impacts from ordered logistic regressions: college GPA, self-rated academic ability, and graduate school

aspirations. This is consistent with prior findings that GPA is an important predictor of the salaries graduates earn (Bacon, 2017). Collegiate internships are sometimes shown more important than choice of major, specifically in the cases of Working Cooperatively, Interpersonal Skills, Analytics And Problem Solving, Getting Along With Dissimilar People, and Leadership Ability. The remaining student-specific control variables, of which there are 27, are consistently less important than the student's choice of college major. GPA, self-rated academic ability, and graduate school ambitions are all positively correlated with one another and related to a student's academic prowess. Therefore, one may perhaps summarize the results of this secondary analysis as follows: There exists evidence in these data that students' academic prowess is more closely related to collegiate skill gains than is their choice of major, in this case marketing, but that choice of major is seemingly more important than other factors including the student's background, demographics, and nonmajor collegiate experiences.

Secondary Findings

In a similar fashion to prior research on the link between marketing education and individuals' success in the field, the authors tested the time-specific validity of the regression models by reestimating all 30 models for each of two subsampled periods—one for the years 1994 to 1999 and one for 2000 to 2006 (Bacon, 2017). In zero skill areas is the sign and statistical significance of the estimated impact of a marketing degree different between the two periods. In more cases than not (18 of 30), the model specification explains marginally more variation in skill changes (adjusted R^2 is marginally larger) during 2000 to 2006 than it does in 1994 to 1999. In these cases, though, the difference in the two adjusted R^2 values is never larger than .05. Thus, the authors view the models estimated with the full-time period 1994 to 2006 to be valid.

While the impact of the marketing course of study is the focus of this work, an interesting and related question is whether students' choice of major or their choice of college/university is more important in terms of reported skill gains at undergraduate graduation. In an attempt to answer this question, the authors calculate partitioned R^2 values for each independent variable before aggregating these values separately for the set of school indicators and then a set of major indicators in each skill area. On average, the gap between the two sums is 0.03, or 3 pp more explanatory power in favor of the school indicators. In short, based on this student panel and the particular skill areas studied, choice of institution is (broadly speaking) marginally more important than choice of major for predicting reported (i.e., perceived) skill change on average. In six skill areas, choice of major appears to be a more telling predictor than choice of institution: Knowledge of Your Field, Reading Speed and Comprehension, Writing Skills, Foreign Languages, Computer Skills, and Mathematics.

Discussion

Research Question 1 taps into how marketing majors' skills are developing between the start and finish of their college experience. Based on the CIRP survey results, most marketing students feel that, over the course of their undergraduate studies, they are developing and honing skills in the vast majority of the 15 focal skill categories from the survey. The lone exception is Foreign Languages. Additionally, the results are somewhat less positive in the areas of Mathematics, Reading Speed and Comprehension, Getting Along With Dissimilar People, and Cultural and Racial Knowledge. Given that some organizations value conceptual global marketing knowledge (Schlee & Karns, 2017), those developing marketing curricula may want to consider improving students' perceived foreign language skills and ability to interact effectively with coworkers, customers, and external collaborators from a range of cultural backgrounds. With regard to the basic skills of Reading and Math, the relatively less positive results may simply be a product of college students coming out of high school with those skills well in hand, at least in comparison with the other skill areas. After all, in both categories, the majority of students still indicate their skills improved. The difference between these areas and the others is just that the proportions of students indicating their skills to have become "much stronger" are considerably smaller. In neither case are there large percentages of students reporting a loss of skills with only 7.1% doing so for Mathematics and just 1.3% for Reading Speed and Comprehension. Still the fact that *any* students are reporting loss of skills in such foundational areas could be seen as a negative result. Interestingly, in writing, a third basic skill, the overwhelming majority of students reported gains. While this finding seems somehow contradictory to students' perceptions regarding the other basic skills, it is consistent with previous findings examining direct measures of student writing ability which reported small but positive effect sizes for year of study (Bacon & Anderson, 2004; Bacon, Paul, Johnson, & Conley, 2008).

The second research question builds on the first to contextualize marketing students' perceived skill gains with those reported by other students. In comparing the feedback from marketing students with those from other programs of study, it is worth pointing out that students from different majors certainly should and do focus their learning efforts in different skill areas more or less depending on their chosen major. Hence, it is to be expected that marketing students should develop in areas like Interpersonal Skills, Working Cooperatively, and Public Speaking. With curricular differences in mind, one might expect marketing majors to compare less favorably to students from the wider spectrum of

curricula from nonbusiness majors versus comparisons with other business majors that will take many of the same core business courses marketing students take. The analyses presented in this text support this expectation. For example, in terms of increased Mathematical skills, marketing majors are very much in the middle of the pack with 9.7% reporting "much stronger" skills. Of the 85 different and specific majors represented in the data, 43 rank above marketing in this regard, while 41 rank below. The top math majors unsurprisingly include mathematics (72.7%), statistics (61.4%), and physics (60.6%), followed by eight different kinds of engineering (35.7% to 48.4%). Majors with the lowest self-reported Mathematical skills improvements include English (3.9%), women's (3.6%) and ethnic (3.6%) studies, and theater/drama (3.0%). For comparison, other majors registering near the 9.7% marketing students posted are nursing (9.4%) and environmental science (9.6%). Again, it would seem these discrepancies are driven by differences in the curricula for different courses of study.

Interpreting some of these comparisons is no easy task, particularly with regard to Computer Skills and Leadership Ability—two areas in which marketing students report "much stronger" skills in much greater proportions than either other business majors or nonbusiness majors. The notion of marketing students developing Computer Skills more so than other business students *could* stem from the common assignment of oral presentations in marketing classes as reflected by the students' positive feedback with regard to Public Speaking. Such presentations are often accompanied by digital media (e.g., Powerpoint), the creation of which could generate learning in the area of Computer Skills. The question of *when* computing skills became germane for marketing students is important in its own right. The increasing importance of digital marketing may lead us to hypothesize (and hope) that marketing students believe they are gaining more computer skills today than in the past. To investigate this matter, we reestimated our primary computer skill model 13 times, once within each of the 13 sample years (1994 to 2006). Figure 1 presents the primary findings of these additional models as a time trend, the changing estimated impact of marketing education on self-reported computer skill gains. Beginning with the graduating class of 1997, an upward trend is clearly shown. In 1997, the average marketing student was 4.8 pp more likely to report "much stronger" computer skills than the average student of a different major, after controlling for the host of relevant factors discussed previously. By 2006, this mean difference had grown to 17.2 pp. The specific explanation of this finding is uncertain, though, based on the data on hand.

With regard to Leadership Ability, the authors are largely uncertain as to why marketing students would feel they had progressed more than other students, but one possibility is that marketing students may be assigned to work in groups more than other students. The relatively large proportion of marketing students reporting "much stronger" skills at Working Cooperatively would seem to support this difference in curricula. If this is in fact the case, the resulting familiarity with team-based work could, in turn, provide the students with a sense of knowing what is required for a team to succeed. In the students' perspective, this may equate to greater Leadership Ability. Here again, this interpretation is purely speculative as the data do not allow for any direct explanation.

A point of potential concern that arises from this analysis is the consistently low rank that the basic skills associated with Reading Speed and Comprehension and Mathematics register in terms of how frequently students deem themselves "much stronger" in these areas. Among all three groups, marketing, other business, and nonbusiness students, the highest proportion of any group that logs "much stronger" ability in either of these skill areas was 16.2% of nonbusiness majors reporting on Reading Speed and Comprehension. Here again, the reason for these low rankings cannot be determined from the data used for this research; however, possible explanations include that many college curricula do not include extensive work in these areas based on the assumption that college-eligible students have already mastered these general skills. While this may be an accurate explanation of students' ratings of their skill developments, the authors do not mean to suggest that all or even most college freshmen possess adequate command of skills in either area. Rather, perhaps it is because the use and improvement of these skills is embedded in other course material that students do not rate these skills as having improved as much as skill areas that they have less exposure to on entering college.

Research Question 3 poses the question of to what extent marketing majors' perceived skill gains are attributable to their choice of major. As measured by the universally small effect sizes in Table 2 (Cohen, 1992; Cramér, 1946), marketing education does not appear related to any of these skill changes in a substantial way. However, as shown later in our primary analysis, once one controls for confounding factors (such as academic ability, student background and demographics, characteristics of the institution attended, and other collegiate experiences), marketing education appears more strongly related to several of these skills. Some of these relationships are found to be positive and others negative.

Controlling for a substantial list of variables that might be expected to impact a student's prior possession of or acquisition of certain skills throughout his or her college career, allows for isolation of the impact of choosing to major in marketing. The resulting regression analyses highlight both the strengths and weaknesses of marketing curricula among the schools within the CIRP survey. Overall, at least by their own judgment, marketing students appear to receive thorough and well-rounded instruction more so than other business students, on average. Given that many of the skills are largely learned or practiced in core curriculum or other

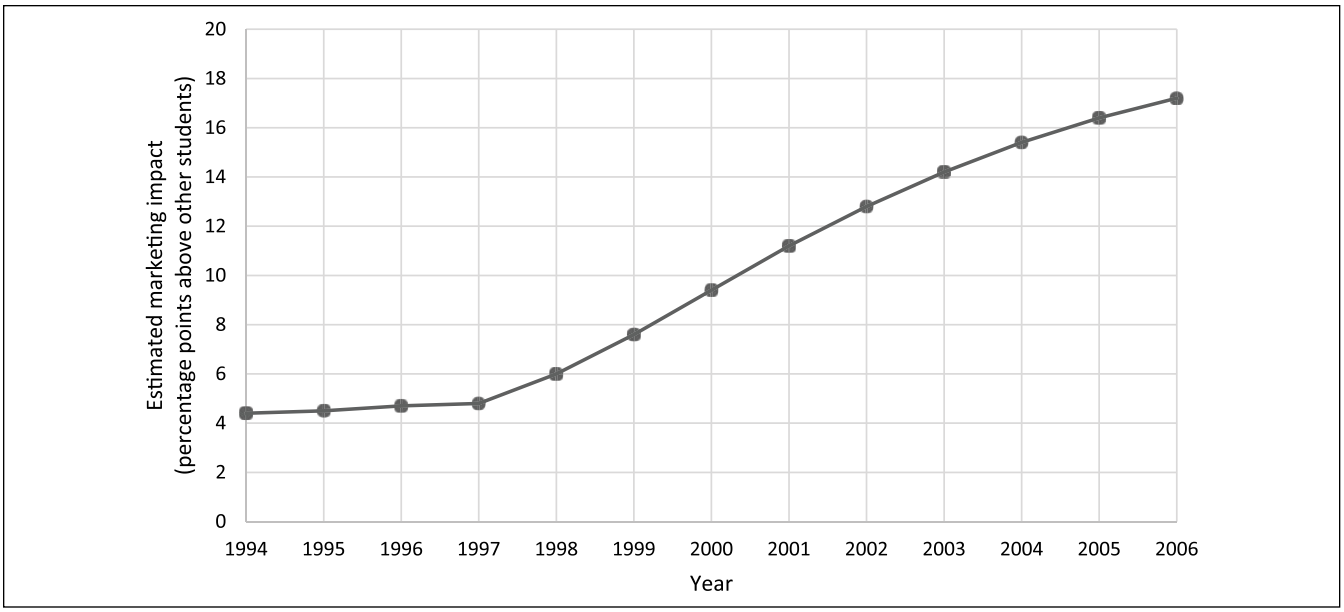

Figure 1. Marketing education and "much stronger" computer skills.

nonmajor classes—the same classes taken by other business majors and nonbusiness majors—explicating this difference is decidedly difficult. Perhaps marketing students' self-ratings are biased upward by an inclination indirectly imparted through the study of marketing: the inclination toward self-promotion. If so, this finding may in fact be seen as verification of effective marketing education.

Conclusion

Implications for Educators

This work centers on the impact of marketing education. However, the analyses presented here can serve as a model and a baseline for educators across disciplines. While the skill areas under study are of more or less importance to students from different fields of study, it seems safe to say that improvement in any or all of the areas would be a positive outcome regardless of a student's chosen field. Also, as aforementioned, objective measures of ability or skill change are not necessarily available for all of the skill categories. Fortunately, the self-reported measures that yielded the data analyzed here are easily replicable with new samples. Therefore, this work presents a basis for comparison that educators could use to gauge their own students' development through the use of a relatively brief and simple survey of those students.

With regard to the focus on marketing education, the findings presented here also suggest that an opportunity for improving marketing curricula may lie in an increased emphasis on the *application* of the key skills students need to succeed in the work environment. Bearing in mind that students' reported improvements may be best characterized as reflections of feelings of self-efficacy with regard to the 15 skill areas, it would seem that marketing students are gaining adequate exposure to these skills to instill confidence in their abilities. These feelings of self-efficacy may result in better performance. But, employer feedback that new marketing graduates are underqualified suggests this effect is delayed, at best. An optimistic view would be that marketing graduates launching their careers are willing to stretch themselves to attempt challenging work even if they prove ill equipped for the task at hand. In their willingness to try, perhaps they ultimately find success. If so, perhaps marketing curricula are serving students well. However, the gap between graduate and employer perceptions remains worrisome. Taking into consideration both perspectives, it would seem marketing curricula showcase the skill areas students need to practice while falling short of generating the ability to effectively apply those skills. This would imply the need for greater emphasis on applied learning opportunities in the classroom and beyond (e.g., experiential learning projects and internships) to improve new marketing graduates' workplace performance. This is in line with prior research that documents the positive impact internships have on students' academic performance and career aspirations (Routon & Walker, 2015).

Furthermore, marketing educators would do well to note the contrast in students' experiences and industry demands. Specifically, a desire for effective methods for tracking the impact of marketing efforts (i.e., Metrics) calls for marketing students to have better skills in quantitative analysis, and increased globalization would seem to necessitate more study of foreign languages and greater cultural awareness

(Schlee & Karns, 2017). In addition, employers report insufficiency in graduates' preparedness for collaboration with others unlike themselves (Hart Research Associates, 2015). As reported here, 40% of marketing students perceived no change or, in limited instances, a decline in their ability to get along with dissimilar people. Thus, students' perceptions do not contradict employers' assessments. Considering multiple perspectives, it would seem improving students' abilities to collaborate beyond their own in-groups represents another opportunity for marketing educators.

Limitations

The authors consider the most significant limitation of this analysis to be the fact that some students who do not major in marketing still take a few marketing courses throughout their collegiate careers, and this occurrence is untraceable in the current data. If this information were available, it would have been (at the very least) included in the control set. However, it is likely generally uncommon for students not majoring in a business discipline to take a marketing course(s), and very common for business majors not fielding in marketing to take just a few courses in marketing if not only one. This is yet another reason why comparing marketing majors directly with other business majors, in addition to a general sample of college graduates, is of large importance.

Furthermore, the reader will recall that the data analyzed here came from graduates during the period 1994 to 2006. It is possible that newer data may improve understanding of the skills marketing majors feel they have gained during their undergraduate tenure. Last, the correlational nature of this data prohibits the precise determination of the causal impact of marketing education on students' perceived skill gains.

Future Research

Going forward, scholars could take this work as a model for assessment of other disciplines. Considering the current findings regarding Foreign Languages and Cultural and Racial Knowledge, such an assessment of the discipline of International Business could be particularly instructive. In a similar fashion, a follow-up study focused on the more quantitative business disciplines such as Accounting or Finance might further illustrate students' experiences in areas such as Mathematics and Analytics and Problem Solving. Another direction for future research would be a parallel analysis based not on self-report measures but instead on objective skill assessments. As aforementioned, doing so might require the development of those assessments for quite a few if not most of the skill areas. Nonetheless, it may be enlightening to compare and contrast the results of the two methodological approaches. The authors hope that this analysis will prove informative for those developing marketing curricula, as well as scholars of marketing education.

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