Industry Notes

- Attracting Students to the Field of Logistics, Part 1

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Abstract
Practitioner and academic literature indicate a shortage of young professionals entering logistics, yet limited research exists to understand how to attract more students to the field. To address this gap, we compare survey data of logistics practitioner job characteristics to survey data of expected job values of undergraduate students from seven universities. Based on personality-job fit theory, this study allows us to explore how to better promote the major and field to students as well as to propose recommendations to redesign logistics jobs to better meet student expectations. The results reveal that intrinsic job characteristics desired by students such as learning and seeing the results of their work are prominent in logistics jobs. However, other significant student expectations, specifically long-term job stability and pace of promotions, are not prominent in logistics jobs. The results further reveal that promotional messages about the industry are most effectively communicated to students via family, business professionals, and presence on the Internet more so than by professors and college advisors. Ultimately,

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this research suggests strategies to increase the number of students both majoring in logistics and entering the professional field to address the workforce shortage.

Keywords
Choice of business major, logistics, work values, personality–job fit theory

Introduction

Supply chain and logistics serve as the underlying infrastructure for global trade, ultimately representing a critical enabler of customer satisfaction and firm success (Ellinger et al. 2011, 2012). Both academic and practitioner research identify workforce as the key resource to enable supply chain and logistics competency (Keller and Ozment 2009; Scott et al. 2015; Wowak et al. 2013), even labeling talent as source of competitive advantage (Hohenstein, Feisel, and Hartmann 2014). Yet the industry currently faces a significant workforce shortage, depicted as a "supply chain talent perfect storm" and "talent tsunami" (Aquino and Draper 2008; Cottrill 2010; Ruamsook and Craighead 2014). Despite managing critical supplies on a daily basis, supply chain and logistics practitioners have been unable to effectively manage their most important resource: people (Marchese and Dollar 2015).

From an academic standpoint, the critical question is how to attract more college students to the major and professional field, including specifically appealing to the current millennial generation (Boucher 2016; Peck 2015). Existing literature offers insight into important factors affecting how college students select their major (Kumar and Kumar 2013; Roach, McGaughey, and Downey 2011; Strasser, Ozgur, and Schroeder 2002), yet none are specific to supply chain and logistics. Additionally, since limited research exists to characterize supply chain and logistics jobs, we do not clearly understand how to best promote the field to students. More specifically, we do not know what messages to convey and how to deliver those messages. In a similar vein, the supply chain and logistics industry could potentially redesign jobs to better match with student interests. In this article, we address these gaps by focusing on the logistics function of supply chain with the following sequential research questions:

RQ1: What do students want in their future jobs?
RQ2: What does the logistics field offer to fulfill these student expectations?

RQ2a: How might the logistics field adapt jobs and work environments to better meet student expectations?
RQ3: How should the logistics field deliver promotional messages to best attract students?

We investigate these questions with a survey of college students in business and industrial engineering (IE) programs as the most likely students to enter the field as well as a survey of logistics practitioners. The student survey addresses RQ1 (what students want) and RQ3 (message delivery) while the practitioner survey reveals matches and mismatches between the student wants and industry job characteristics (RQ2, RQ2a). The combined efforts allow us to form an action plan by which to increase the attractiveness and prominence of logistics jobs and the academic major.

Literature Review

For this article, we define *supply chain* as the processes involved in sourcing, producing, and distributing products and services, and we define *logistics* as a subfield of supply chain involving the movement and storage of goods and materials. While supply chain and logistics represents the second-fastest growing field of business study, the growth is not fast enough (Holcomb, Krul, and Thomas 2015; Ozment and Keller 2011). There is a clear shortage of young professionals entering the industry to meet job growth related to expansion of the field combined with the rapid retirement of the Baby Boomer generation currently working in the field (Harrington 2015). Additionally, both the required skill set of supply chain and logistics professionals and the complexity of logistics decisions are expanding (Holcomb, Krul, and Thomas 2015; Holcomb, Liao-Troth, and Manrodt 2014; Pohlen 2011). As such, Ozment and Keller (2011, 78) call for "large scale commitment to the development of this discipline," and they state that "the number of programs, courses, students, and faculty must increase at a faster rate."

We can relate the problem to information systems (IS), which also represents a relatively new program of study with a strong job market yet insufficient supply of majors (Akbulut-Bailey 2012; Kuechler, McLeod, and Simkin 2009). Literature notes a lack of awareness about IS careers among students and even advisors, arguing that students do not get enough information about the field early in their education (Walstrom et al. 2008; Wong 2015). It is interesting that one study found that logistics and operations was the only field of which students had less awareness and knowledge than IS (Walstrom et al. 2008).

Literature suggests that attracting students to supply chain and logistics is relatively difficult. To start, supply chain and logistics is a relatively new field and is rarely required coursework. In addition, schools with a supply chain or logistics major are atypical, and only about 5 percent of students opt for such a major when it is available (Ozment and Keller 2011). Moreover, student familiarity of the field is low, and it is difficult to pique students' interest even when they are aware of the potential of the major (Gardner, Gausman, and Silvers 2009; Knemeyer and Murphy 2004; Knemeyer, Murphy, and Poist 1998). Despite such concerns, there appears to be limited extant literature specifically examining why students will or will not major in supply chain or logistics, including ideas on how to make the major and industry careers more compelling for students.

Selecting a Major

Selection of a college major has lasting impacts on students well into their careers (Porter and Umbach 2006). Galotti (1999) highlights the stress experienced during the process, describing how students can limit information and options to curb such stress. College students generally select their major by their sophomore year (Turner and Bowen 1999) and, in fact, some report that more than half of the students select a major while still in high school (Walstrom et al. 2008). The underlying challenge remains that students will retain incomplete information about major options and subsequent careers (Galotti 1999; Walstrom et al. 2008). Consequently, there are likely significant gaps between students' expectations about particular careers and the reality of those careers (Roach, McGaughey, and Downey 2011).

Specific to the challenge at hand, students are likely selecting their major before they are exposed to the importance of and opportunities in supply chain and logistics. Knemeyer and Murphy (2004) found that although inserting supply chain and logistics faculty into freshman- and sophomore-level courses increased awareness of the field, it did not boost student interest in entering the field. This finding suggests that we are likely failing to develop the right messages to "sell" supply chain and logistics as well as to deliver these messages via the most effective media. For example, research in other fields reveals that promises of jobs and pay do not necessarily stimulate more majors (Kuechler, McLeod, and Simkin 2009). Ultimately, we are not impacting the major selection process to effectively attract students to the field, and limited literature specific to supply chain and logistics exists to address this gap.

Existing research has thoroughly examined the undergraduate student major selection process from perspectives of all majors, business majors as a whole, and specific business majors other than supply chain and logistics. Such literature can be categorized as exploring *personality*, *career benefits*, *aptitude*, and *social influence* factors. For instance, some research links *personality* stereotypes to majors (e.g., accounting majors being reserved, concrete, and practical), suggesting that personality may predispose students toward a particular major (Noël, Michaels, and Levas 2003). Personality traits can be tied to inherent interest in a subject (Worthington and Higgs 2004), and much extant literature links subject matter interest as one of the most important major selection factors (Malgwi, Howe, and Burnaby 2005; Beggs, Bantham, and Taylor 2008).

Research has found that while subject matter interest remains primary for students in their early college years, more concrete *career benefits* such as job availability, advancement, and compensation can become more prominent closer to graduation (Malgwi, Howe, and Burnaby 2005; Strasser, Ozgur, and Schroeder 2002). Additional career benefits that students consider include job security (Roach, McGaughey, and Downey 2011; Walstrom et al. 2008), prestige (Francisco, Noland, and Kelly 2003), and social image (Kumar and Kumar 2013). Other studies find that self-perceived *aptitude* can significantly influence selection or avoidance of a major (Kumar and Kumar 2013). In doing so, students consider difficulty of coursework (Zhang 2007), performance in classes (Calkins and Welki 2006), their quantitative capabilities (Allen et al. 2014), and even the need to maintain skill sets after graduation (Kuechler, McLeod, and Simkin 2009).

Finally, major selection research often integrates personality, career benefits, and aptitude factors with *social influences*, specifically what resources (e.g., people, media) most affect the process. The results appear to be inconsistent. For instance, some research highlights significant impacts of faculty over family and advisors (Beggs, Bantham, and Taylor 2008), while other studies identify family and advisors (both college and high school) as more important influencers (Kuechler, McLeod, and Simkin 2009). Yet other work shows evidence for both (Kumar and Kumar 2013; Zhang 2007). Additional influencers identified in the literature include college department websites and brochures, Internet searches, courses in early years of college (Pappu 2004; Walstrom et al. 2008), and faculty approachability and reputation (Calkins and Welki 2006). Research has found that while all factors (personality, career benefits, aptitude, social influences) can be

meaningful, social influences tend to be lower in significance (Kuechler, McLeod and Simkin 2009; Kumar and Kumar 2013).

Research Opportunities

There are two critical, related takeaways from the literature. First, information that students receive about supply chain and logistics in their education is typically neither timely nor meaningful. Second, the process to select a college major and ensuing career remains highly complex if not overwhelming given many influencing factors and a lack of full information. With limited literature assessing the supply chain and logistics major combined with the talent shortage in industry, the field urgently needs to understand how to better market itself to students. Such marketing includes determining the most effective messages to promote the strengths of supply chain and logistics jobs relative to what students want and the most influential approaches to deliver these messages (Beggs, Bantham, and Taylor 2008).

This research explores this gap by empirically evaluating the job expectations of students then assessing how these expectations align with actual careers as reported by those currently employed in the field. Such alignment of student expectations and actual practitioner jobs is founded on personality–job fit theory in that a stronger match between students' expectations and actual work will attract more students (Kristof-Brown, Zimmerman, and Johnson 2005). With limited research incorporating industry perspectives with academic majors (Gibson and Cook 2003), the article therefore provides an additional contribution to extant literature.

Methodology

We accomplish the research objectives with surveys of both students and practitioners, focusing specifically on the logistics function given the breadth of the supply chain field. We base the research on work values, which directly influence employee attitudes, perceptions, and behaviors (Dose 1997; Ravlin and Meglino 1987). Such values encapsulate the personality and career benefits fit factors presented in the literature review. The student and practitioner surveys both assess the same work value items. To develop this list, we first built a comprehensive collection of work values from existing literature. Using the collective knowledge of the research team with respect to organizational behavior and human resources, we consolidated the list to 44 items. We then surveyed 409 undergraduate college students to isolate the 22 most significant work values.

Next, we conducted an exploratory factor analysis (EFA) to categorize the items into seven factors defined in table 1. Five factors match existing research assessing generational differences in work values by Twenge at al. (2010), including *intrinsic*, *extrinsic*, *altruistic*, *social*, and *leisure*. Two additional values, *supervisory* and *stability*, originate from related work values literature (Hurst and Good 2009; Luscombe, Lewis, and Biggs 2013; Ng, Schweitzer, and Lyons 2010) as well as feedback from faculty and practitioners.

Student Survey

The student survey (see the appendix) asked respondents to evaluate each of the 22 work values based on the question "Thinking ahead to after college graduation, how important is each item below for your ideal job?" We also asked students about the level of influence of particular resources (e.g., professors, family, business professionals) in their decision of a college major. This list of influencers was consolidated from the existing research in the social influences section of

Table 1/Work Values

Value	Definition	Components	Sample References
Intrinsic	Intangible rewards that reflect inherent interest in work	Learning, maintaining skills, see results, creativity	Hurst and Good 2009; Luscombe, Lewis, and Biggs 2013; Twenge et al. 2010
Extrinsic	Tangible rewards external to the individual	Pay, advancement, status, respect	Hurst and Good 2009; Luscombe, Lewis, and Biggs 2013; Twenge et al. 2010
Supervisory	Interaction with and oversight by supervisor	Feedback, instructions, personal commitments	Hurst and Good 2009; Luscombe, Lewis and Biggs 2013; Terjesen, Vinnicombe, and Freeman 2007
Social	Need to belong or to be connected	Friends, contacts, common interests	Hurst and Good 2009; Luscombe, Lewis, and Biggs 2013; Terjesen, Vinnicombe, and Freeman 2007; Twenge et al. 2010
Altruistic	Motivation to help others and society through work	Helpful to others, worthwhile to society	Hurst and Good 2009; Luscombe et al. 2013; Ng, Schweitzer, and Lyons, 2010; Twenge et al. 2010
Leisure	Opportunity for time outside work, slower pace	Vacation, time for other things, easy pace	Boswell et al. 2003; Luscombe, Lewis, and Biggs 2013; Twenge et al. 2010
Stability	Need for long-term certainty	Retirement plan, health plan, stability	Boswell et al. 2003; Ng, Schweitzer, and Lyons 2010; Twenge, Campbell, and Freeman 2012

the literature review. Our research separates work values and social influencers, unlike existing research which typically intermingles the two (Beggs, Bantham, and Taylor 2008).

The survey was distributed electronically via Qualtrics, a professional survey tool, to students in business and industrial engineering (IE) undergraduate programs given that these students are most likely to enter the field of logistics. Data was collected from seven different large public universities in one state in the southeastern United States as a part of a study with a logistics center located in the state. Data collection from these multiple diverse schools enhances the generalizability of the results. Over a span of three weeks 7,100 students were surveyed; several e-mail reminders were distributed during that time to encourage response. After eliminating responses that were incomplete or had limited variability (i.e., straightlined), the final usable data set was 1,620 students (22.8% response rate). Table 2 overviews student demographics.

Practitioner Survey

The practitioner survey (appendix) specifically targeted the logistics field. The survey contained the same 22 items as the student survey, but the question was posed to reflect their job (e.g., "Consider your current job in logistics. Do you have a job where you have the chance to be creative?"). The survey was pretested with a panel of 28 logistics practitioners and academics, and we used their feedback to refine the survey wording and flow to maximize face validity.

Table 2/Student Demographics

Age	Mean: 25.72	Median: 23
Discipline	Business: 1366	IE: 254
Gender	Male: 773	Female: 887
Grade point average	Mean: 3.25	Median: 3.28
Work experience (more than 1 possible)	Part time: 1,068	Internship: 551
	Full time: 551	None: 111
Major (more than 1 possible)	Management: 368	Supply chain/ops: 125
	Accounting: 294	International business: 65
	IE: 254	General business: 46
	Marketing: 224	Economics: 43
	Info systems: 152	Other: 21
	Finance: 141	Interdisciplinary: 18

The practitioner survey distribution list was provided by the aforementioned logistics center. Qualtrics was again used to distribute the survey electronically. Data was collected over a three-week period with three e-mail reminders to participate. We eliminated respondents with less than one year of logistics work experience as well as those providing incomplete responses, yielding a data set of 425 from the list of 3,040 (14.0% response rate). Table 3 summarizes practitioner demographics.

Results

Table 4 reveals that the students consider the most important work values relative to their future jobs to include *extrinsic* (specifically: chances for promotion, money), *intrinsic* (see results, learn), and *stability* (secure future, retirement, benefits). Leisure (vacation, slow pace) and social (friends, contacts, common interest) characteristics rank low relative to the other factors. Two-population comparisons of means reveal certain significant differences between business and IE students (e.g., some social characteristics are more important for IEs), but the overall item rankings are still generally very similar.

Students across all majors identify *family*, *business professionals*, and *Internet research* as most influential in selecting a college major (table 5). Their school's reputation, professors, friends, and fellow students are also moderately influential. IE students indicate significantly lower influence

Table 3/Practitioner Demographics

Years logistics experience	Mean: 17	Max: 46	Min: 1
Age	Mean: 45	Max: 73	Min: 20
Gender	Male: 297	Female: 123	
Work level	Nonmanager: 98	Manager: 91	
	Director: 150	Executive: 85	
Firm size (employees)	1–10: 40	11–50: 48	
	51–250: 110	251+: 225	
Role	Operations: 117	Procurement: 33	
	Sales: 121	Account Management: 48	
	Consultant: 44	Info Systems: 15	
	Leadership: 115	Other: 45	
Company type	Carrier: 127	Shipper: 78	
	Warehouse: 101	3PL: 133	
	Forwarder: 67	Information Systems: 33	
	Port/airport: 20		

Table 4/Student Job Expectations

Construct		Indicator[a]	All Students		Business Students		IE Students	
			Mean	Rank	Mean	Rank	Mean	Rank
Intrinsic (INT)	1	Learn	**4.25**	**3**	**4.23**	**4**	**4.32**	**1**
	2	Skills	3.95	9	4.00	8	3.68****	10
	3	Results	**4.31**	**2**	**4.31**	**2**	4.31	**2**
	4	Creative	3.67	10	3.67	10	3.67	11
Extrinsic (EXT)	5	Money	4.06	7	4.10	7	3.87****	6
	6	Promotion	**4.32**	**1**	**4.35**	**1**	**4.20*****	**3**
	7	Status	3.24	18	3.25	18	3.18	20
	8	Respect	3.48	15	3.49	16	3.41	16
Supervisory (SUP)	9	Feedback	3.67	10	3.66	11	3.69	9
	10	Instruction	3.47	16	3.52	15	3.21****	19
	11	Personal	3.97	8	3.98	9	**3.91**	**5**
Social (SOC)	12	Friends	3.13	19	3.07	20	3.43****	15
	13	Contact	3.11	20	3.07	20	3.36****	17
	14	Interests	3.10	21	3.08	19	3.17	21
Altruistic (ALT)	15	Worthwhile	3.61	13	3.61	13	3.61	12
	16	Helpful	3.64	12	3.65	12	3.59	13
Leisure (LEI)	17	Vacation	3.28	17	3.29	17	3.23	18
	18	Time	3.52	14	3.53	14	3.46	14
	19	Pace	2.24	22	2.25	22	2.17	22
Stability (STA)	20	Retirement	4.09	6	4.13	6	3.85****	8
	21	Benefits	**4.23**	**4**	**4.27**	**3**	**4.03****	**4**
	22	Future	**4.16**	**5**	**4.21**	**5**	3.87****	6

[a] Refer to the full survey in the appendix. *Scale*: 1 – Not important; 2 – Somewhat important; 3 – Important; 4 – Very important; 5 – Essential.

Notes: Difference business vs. IE: ****p-value < 0.001, ***p-value < 0.01

of business professionals, professors, and advisors than business students based on two-population comparisons of means, yet IEs designate Internet research, school reputation, friends, and other students as more influential.

Table 6 indicates that the work values most prevalent in logistics practitioner jobs include *intrinsic* (specifically: see results, learn, creativity), *social* (contacts, friends), and *altruistic* (helpful, worthwhile to society). Extrinsic (respect, status, promotion) and leisure (slow pace, time for other things) characteristics are the least prominent. Next we compare the practitioner results to the student results to assess the strengths and weaknesses of the logistics field in appealing to the students.

Table 5/Influencers of Student Selection of Major

	All Students		Business Students		IE Students	
Influencer[a]	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
Family	**3.54**	**1**	**3.53**	**2**	**3.66**	**2**
Business professionals	**3.50**	**2**	**3.57**	**1**	3.16****	5
Internet research	**3.42**	**3**	**3.38**	**3**	**3.60*****	**3**
School reputation	3.29	4	3.19	4	**3.90****	**1**
Professors	3.04	5	3.10	5	2.71****	7
Friends	2.97	6	2.95	6	3.17***	4
Other students	2.72	7	2.65	7	3.16****	6
College advisors	2.39	8	2.44	8	2.13****	9
High school teachers	2.27	9	2.37	9	2.41	8
High school advisors	1.77	10	1.80	10	1.61***	10

[a] Refer to the full survey in the appendix. *Scale*: 1 – Not influential; 2 – Slightly influential; 3 – Moderately influential; 4 – Very influential; 5 – Extremely influential.

Notes: Difference business vs. IE: ****p-value < 0.001, ***p-value < 0.01

Table 6/Practitioner Work Characteristics

			Practitioners	
Construct		**Indicator[a]**	**Mean**	**Rank**
Intrinsic (INT)	1	Learn	**4.38**	**2**
	2	Skills	4.09	8
	3	Results	**4.41**	**1**
	4	Creative	**4.17**	**5**
Extrinsic (EXT)	5	Money	3.84	12
	6	Promotion	3.65	17
	7	Status	3.48	19
	8	Respect	3.64	18
Supervisory (SUP)	9	Feedback	3.75	13
	10	Instruction	3.17	21
	11	Personal	3.92	9
Social (SOC)	12	Friends	4.14	6
	13	Contact	**4.38**	**2**
	14	Interests	3.88	10
Altruistic (ALT)	15	Worthwhile	4.13	7
	16	Helpful	**4.32**	**4**
Leisure (LEI)	17	Vacation	3.88	10
	18	Time	3.30	20
	19	Pace	2.17	22
Stability (STA)	20	Retirement	3.72	15
	21	Benefits	3.73	14
	22	Future	3.70	16

[a] Refer to the full survey in the appendix. *Scale*: 1 – Strongly disagree to 5 – Strongly agree

Implications

Addressing RQ1, table 4 reveals important job expectations of undergraduate students, identifying what messages would be impactful for promoting particular college majors and careers to these students. The importance of promotions (*extrinsic*) seems to align with perceptions of the current college generation wanting to move up quickly in the organization, while the low significance of *leisure* refutes stereotypes about their work ethic (Anders 2015). The *intrinsic* factor may appeal to not only students' desire for personal growth but also their interest in maximizing future career opportunities. Additionally, the prominence of the *stability* factor among the current generation may arise from watching their parents struggle with job security during two significant recessions in recent decades. Low importance of the *social* factor likely stems from students intending to maintain their primary social connections outside of work as they do not yet value a collegial work network. IE students place less importance on skills, money, promotion, instruction, and stability than business students yet seek greater levels of social interaction. This finding implies that logistics promotional messages should be tailored to some extent depending on the student audience.

Addressing RQ2 and RQ2a, figure 1 presents a matrix comparing the importance of student job expectations from table 4 (vertical axis) with the prevalence of characteristics of actual logistics jobs from table 6 (horizontal axis). The most important student job expectations in the top half of the matrix retain statistical significance of four or greater ("very important" or "essential"). Similarly, the most prevalent industry work characteristics in the right half of the matrix also retain statistical significance of four or greater ("agree" or "strongly agree"). Each item is labeled with its corresponding factor (i.e., INT - intrinsic, EXT - extrinsic). The matrix quadrants are labeled as *Improve*, *Promote*, *Discount*, and *Target* based on alignment of the importance of student job expectations and the prevalence of actual logistics job characteristics, thereby revealing strengths and weaknesses of careers in logistics.

The upper-right *Promote* quadrant designates the logistics industry's primary employment strengths, matching important student job expectations with strong levels of three intrinsic characteristics (see results, skills, learn) and one supervisory characteristic (support for personal commitments). As such, logistics employers and professional organizations (such as the Council of Supply Chain Management Professionals) can promote the industry's dynamic, challenging, results-oriented environment of continuous learning and problem solving. Professors and college advisors can

	Industry Weaknesses	Industry Strengths
Most Important Student Expectations	**Improve** *Promotion (EXT)* *Money (EXT)* *Benefits (STA)* *Future (STA)* *Retirement (STA)*	**Promote** *Results (INT)* *Learn (INT)* *Skills (INT)* *Personal (SUP)*
Less Important Student Expectations	**Discount** *Feedback (SUP)* *Instruction (SUP)* *Respect (EXT)* *Status (EXT)* *Time (LEI)* *Pace (LEI)* *Interests (SOC)*	**Target** *Creative (INT)* *Helpful (ALT)* *Worthwhile (ALT)* *Vacation (LEI)* *Friends (SOC)* *Contact (SOC)*
	Less Prevalent Industry Characteristics	Most Prevalent Industry Characteristics

Figure 1 Logistics Industry Strengths Compared to Student Job Expectations

also incorporate such messages in class and during student interactions. Additionally, the field can market its strength relative to supervisor support for personal commitments, communicating that logistics employers respect employee needs outside of work.

The upper-left quadrant of the matrix (*Improve*) depicts opportunities for job design improvements for logistics employers relative to important student expectations. Specifically, some extrinsic (promotion and pay) and stability (benefits, secure future, and retirement) characteristics that are very important to students are not prevalent in logistics practice. So employers should consider increasing promotion opportunities by adding job levels within their organizations. Similarly, employers can explore ways to enhance compensation packages to young employees, perhaps through stock ownership and bonuses that are typically reserved for higher levels. Employers should also find ways to offer stronger health care and retirement benefits to younger employees to address stability, bearing in mind that such changes should not come at the expense of pay. Equally, employers can present stable career progression and consistent reassurance of performance to young employees to address concerns about a secure future.

The bottom half of the matrix contains lesser important student job values. The lower-right quadrant (*Target*) presents potential prospects to opportunistically promote industry strengths such as altruistic (worthwhile, helpful), social (friends, contact), leisure (vacation), and intrinsic (creativity) as secondary marketing messages that may be impactful for some students. For instance, table 4 indicates that social values are more important to IEs, compelling employers looking for IEs to promote the strongly collegial social network of the logistics field. In this vein, further dissection of the student data (e.g., by gender, race, age, and so on) could reveal opportunities to promote logistics job strengths to specific subsets of students, possibly also luring students from related majors (e.g., international business, management). For the altruistic factors for example, the industry's prominent impacts on consumers and global trade may appeal to certain student groups. Similarly, existing research has identified different career values of freshmen and seniors, suggesting the promotional messages may be altered based on the course level.

Finally, the bottom-left quadrant (*Discount*) area indicates where lower student job expectations are matched by a lack of prevalence in industry. Examples include supervisory (feedback, instruction), leisure (time for other things, slow pace), extrinsic (status, prestige), and social (common interests). So the industry can likely downplay messages related to these values and focus promotional and hiring messages on characteristics in other quadrants of the matrix.

Diverging from figure 1, there may be cases in which students simply need to better understand and adjust to the reality of logistics jobs, relying on guidance from business professionals and professors to reframe their expectations. For example, structured internships, especially during students' early time in college, offer a way to provide students with practical experience about pathways to earning promotions and the importance of social networking in the workplace (Goffnett et al. 2012). The use of alumni as career coaches and job shadowing to understand a "day in the life" of a logistician could also be effective (Holcomb, Krul, and Thomas 2015). Furthermore, companies and professional organizations can better prepare students for workplace realities by partnering with professors and academic programs to integrate logistics site visits, applied projects, and case studies with class work.

Influencers and Media

This discussion emphasizes specific logistics industry messages (e. g., intrinsic) that may best attract college students to the field. The results of the influencers of student major selection (table 5) address RQ3 to reveal

the resources and media by which the industry can deliver such promotional messages to best persuade students. These results suggest a moderately informal major selection process that primarily relies on family and Internet research but also friends and other students to some extent. The influencers differ to a degree depending on the target audience of business or IE students. The industry should thus cast a broad net with employment promotional material to inform and motivate the different influencers. For instance, logistics companies and professional organizations can better promote the field with a stronger, more compelling educational presence on the internet, including messaging targeted to not only students but also their parents. Marketing the field to parents represents a paradigm shift, but the results herein suggest its strong potential.

Additionally, the field could expand avenues to connect logistics professionals to students, particularly business students, and even their families through guest speaking, career fairs, site visits, and other events. This connection should occur before or during students' freshman and sophomore years in college given the timing of the major selection process previously discussed. Similarly, inserting popular logistics faculty or engaging logistics-oriented simulations exercises in freshmen-level courses could increase comprehension and interest. Some literature supports promotion of the field to even younger groups. Examples include high school–level logistics internships (Knemeyer and Murphy 2004), training for high and middle school teachers to incorporate logistics examples and problems in their classes (Gardner 2013), and logistics day camps for middle school students (Gardner, Gausman, and Silvers 2009).

To be successful, such opportunities would rely heavily on enhanced collaboration between logistics companies, professional organizations, universities, high schools, and government (Holcomb, Krul, and Thomas 2015; McCrea 2015; Scott et al. 2015). Ozment and Keller (2011) emphasize the need for a unified voice across these parties, and others stress regional coordination to address specific skill sets and job needs (Ross et al. 2015). Such collaboration could take the form of logistics case competitions, curriculum changes, scholarships, and coaching programs as well as less formal opportunities such as industry guest speakers, alumni success stories, and job and social networking (e.g., LinkedIn, industry-sponsored events). Additional examples include logistics training co-developed and delivered by industry and academia and massive open on-line courses (MOOCs) (McCrea 2016).

Additionally, while several supply chain and logistics professional organizations already extend low or no-cost memberships to students,

they could increase collaboration with academic programs to offer certifications as a part of undergraduate coursework as well as directly support student logistics clubs, such as by providing guest speakers and promotional media for student meetings. Industry could also work with academic programs to show how logistics skills present synergies with other majors (e.g., marketing) to encourage minoring and double majoring in logistics. All of these activities would enhance social support for the logistics field, which has been identified as important to selection of a college major (Akbulut-Bailey 2012).

Conclusion and Future Research

Current popular press underlines a lack of understanding of the needs and expectations of the current millennial generation, in some cases depicting misunderstanding, frustration, and even conflict among employers and millennials. Peck (2015), Boucher (2016), and others specifically encourage the need to better understand the millennial generation to increase their attraction to the field of supply chain and logistics. Industry experts anecdotally identify key expectations such as job switching, immediate feedback and results, and fast pace of promotions (Burnson 2014; Donati 2015; Peck 2015), but such claims have needed further empirical validation. Relatedly, the field of supply chain and logistics does not seem to be delivering the right promotional messages to millennials given the talent shortage in the field.

To address these concerns, this research sought to compare the job expectations of current college students in business and industrial engineering with the characteristics of actual jobs in logistics. The results identify industry strengths (e.g., intrinsic characteristics) that can be promoted to students to enhance the attractiveness of the industry. The results also reveal industry weaknesses (e.g., pace of promotions, job stability) that employers should consider addressing to further enhance the industry's desirability. Additionally, the research offers insight into how and through whom (e.g., family, business professionals, Internet) to deliver promotional messages about the industry to garner the most interest from students.

While the research herein provides a strong start to addressing the logistics labor shortage, more research is needed to help the industry further overcome challenges with student awareness and interest. One research opportunity exists with benchmarking accomplished young logistics professionals to reveal key strengths for success in the field. Such awareness would allow academic programs to better identify potential logistics

majors early in their education, perhaps even in high school. Given that many students are generally not exposed to logistics until later in college, possibly after selecting a major, the logistics profile could help academic programs deliver positive messages to recruit students to change majors, double major, or at least consider a career in logistics (Malgwi, Howe, and Burnaby 2005). Furthermore, the survey could be extended to other groups beyond students to build a broader candidate pool for the field. One such example includes existing working professionals (with and without college degrees) who are looking to switch jobs and fields. Additionally, military personnel and veterans, many of whom already have significant logistics work experience, present another rich group for study. These groups will likely have different job expectations than the sampled student set.

Another area of further study involves assessing which specific logistics industry characteristics need to change to adapt to students and where students need to adapt to industry needs. Practitioners and academics may initially take a stance that students must always adapt to industry. However, it is clear that the students do not yet fully understand the reality of industry, and simply telling them that their expectations are unreasonable may even repel them from the field. Moreover, some student job expectations that seem unrealistic and reaching at first consideration may actually represent the workplace of the future. Benchmarking top employers, both within logistics and in other industries, could help understand how the industry can effectively adapt to the young generation.

Additionally, future research could give greater insight into the specific roles of influencers (e.g., family, business professionals) to understand the conditions and timing to best utilize such social support to increase awareness of and interest in logistics (Akbulut-Bailey 2012). With family as the primary influencer, it would be helpful to learn from where parents obtain their information about careers to better target promotional messaging. Equally, research could further investigate the major selection decision-making process to further specify the sequence and interaction of career goal formation with actual major selection (Noël, Michaels, and Levas 2003).

Ultimately, research like that proposed above is needed. The industry is taking a more proactive approach to talent management (Stank et al. 2015), but the talent shortage in logistics remains significant. The depleted supply of young professionals entering the field has significant ramifications for employers, including concerns about labor quality, higher salaries, and ultimately increased turnover. The urgency of such research amplifies each year as the millennials extend their presence as the largest generation in the workforce. The logistics industry needs continued help to sustain its bright

future by both building its brand as a desirable, sought-after industry and helping logistics companies appreciate how to design work environments to become employers of choice.

Appendix

Student and Practitioner Surveys

Work Values/Characteristics

The student survey and the practitioner survey examined the same 22 work values in the table below. The **student** survey asked: "Thinking ahead to after college graduation, how important is each item below for your *ideal* job. A job . . ." Scale: 1 – Not important; 2 – Somewhat important; 3 – Important; 4 – Very important; 5 – Essential. The **practitioner** survey asked: Consider your current job in logistics. "Do you have a job . . ." Scale: 1 – Strongly disagree to 5 – Strongly agree.

Construct		Indicator	Wording
Intrinsic	1	Learn	Where you can learn new things, learn new skills
	2	Skills	Where the skills you learn will not go out of date
	3	Results	Where you can see the results of what you do
	4	Creative	Where you have the chance to be creative
Extrinsic	5	Money	Which provides you with a chance to earn a good deal of money
	6	Promotion	Where the chances for advancement and promotion are good
	7	Status	That has high status and prestige
	8	Respect	That most people look up to and respect
Supervisory	9	Feedback	Where you receive frequent feedback on your work
	10	Instruction	Where you receive detailed instructions for your work
	11	Personal	Where your supervisor supports your personal commitments
Social	12	Friends	That gives you a chance to make friends
	13	Contact	That permits contact with a lot of people
	14	Interests	Where you have common interests with coworkers
Altruistic	15	Worthwhile	That gives you the opportunity to be directly helpful to others
	16	Helpful	That is worthwhile to society
Leisure	17	Vacation	Where you have more than two weeks vacation
	18	Time	Which leaves a lot of time for other things in your life
	19	Pace	With an easy pace that lets you work slowly
Stability	20	Retirement	With a good retirement plan (e.g., 401k)
	21	Benefits	With a good health care and benefits plan
	22	Future	That offers a reasonably predictable, secure future

Influencers in Selecting a Major

The student survey also asked about influencers in selecting a major: "How important has each of the following been in influencing your decision of your college major(s)?" Scale: 1 – Not influential; 2 – Slightly influential; 3 – Moderately influential; 4 – Very influential; 5 – Extremely influential.

	Influencer		
1	Family	6	Friends
2	Business professionals	7	Other students
3	Internet research	8	College advisors
4	School reputation	9	High school teachers
5	Professors	10	High school advisors

References

Akbulut–Bailey, A. 2012. "Improving IS Enrollment Choices: The Role of Social Support." *Journal of Information Systems Education* 23 (3): 259–70.

Allen, C., P. Kumar, C. Tarasi, and H. Wilson. 2014. "Selling Sales: Factors Influencing Undergraduate Business Students' Decision to Pursue Sales Education." *Journal of Marketing Education* 36 (2): 94–104.

Anders, G. 2015. "28,700 Bosses Share Tips on Putting Millennials to Work." *Forbes*, http://www.forbes.com/sites/georgeanders/2015/07/06/28700-bosses-share-tips-on-putting-millennials-to-work/#579e66491ef3 (retrieved July 6, 2015).

Aquino, D., and L. Draper. 2008. "Supply Chain Talent: State of the Discipline." *AMR Research*, http://www.gartner.com/doc/1339814/supply-chain-talent-state-discipline (retrieved July 24, 2015).

Beggs, J. M., J. H. Bantham, and S. Taylor. 2008. "Distinguishing the Factors Influencing College Students' Choice of Major." *College Student Journal* 42 (2): 381–94.

Boucher, J. 2016. "Attracting Millennials to Logistics Jobs." *Supply and Demand Chain Executive*, http://www.sdcexec.com/article/12155448/attracting-millennials-to-logistics-jobs (retrieved February 8, 2016).

Boswell, W. R., M. V. Roehling, M. A. LePine, and L. M. Moynihan. 2003. "Individual Job-Choice Decisions and the Impact of Job Attribute and Recruitment Practices: A Longitudinal Field Study." *Human Resource Management* 42 (1): 23–37.

Burnson, P. 2014. "30th Annual Salary Survey: Reeling in the Talent." *Logistics Management*, http://www.logisticsmgmt.com/article/30th_annual_salary_survey_reeling_in_the_talent (retrieved July 15, 2015).

Calkins, L. N., and A. Welki. 2006. "Factors that Influence Choice of Major: Why Some Students Never Consider Economics." *International Journal of Social Economics* 33 (8): 547–64.

Cottrill, K. 2010. "Are You Prepared for the Supply Chain Talent Crisis?" *MIT Center for Transportation and Logistics*, http://www.Distributiongroup.com/articles/0211mit (retrieved May 22, 2015).

Donati, M. 2015. "Technically Adept Supply Chain Millennials Deliver Results, but Unrealistic about Promotion Chances—Survey." *Supply Management*, http://www.supplymanagement.com/news/2015/technically-adept-supply-chain-millennials-deliver-results-but-unrealistic-about-promotion (retrieved August 18, 2015).

Dose, J. J. 1997. "Work Values: An Integrative Framework and Illustrative Application to Organizational Socialization." *Journal of Occupational and Organizational Psychology* 70 (3): 219–40.

Ellinger, A. E., M. Natarajarathinam, F. G. Adams, J. B. Gray, D. Hofman, and K. O'Marah. 2011. "Supply Chain Management Competency and Firm Financial Success." *Journal of Business Logistics* 32 (3): 214–26.

Ellinger, A., H. Shin, W. M. Northington, F. G. Adams, D. Hofman, and K. O'Marah. 2012. "The Influence of Supply Chain Management Competency on Customer Satisfaction and Shareholder Value." *Supply Chain Management: An International Journal* 17 (3): 249–62.

Francisco, W. H., T. G. Noland, and J. A. Kelly. 2003. "Why Don't Students Major in Accounting?" *Southern Business Review* 29 (1): 37–40.

Galotti, K. M. 1999. "Making a 'Major' Real-Life Decision: College Students Choosing an Academic Major." *Journal of Educational Psychology* 91 (2): 379–87.

Gardner, L. L. 2013. "Teaching Teachers about Supply Chain Management to Influence Students' Career and Education Choices." *Decision Sciences Journal of Innovative Education* 11 (2): 185–92.

Gardner, L. L., L. C. Gausman, and K. J. Silvers. 2009. "Recruiting the Supply Chain Professionals of the Future: A Supply Chain Summer Camp for Middle School Students." *Decision Sciences Journal of Innovative Education* 7 (1): 221–32.

Gibson, B. J., and R. L. Cook. 2003. "Entry-Level Logistics Management Hiring Issues." *International Journal of Logistics Management* 14 (1): 121–34.

Goffnett, S. P., R. L. Cook, Z. Williams, and B. J. Gibson. 2012. "Understanding Satisfaction with Supply Chain Management Careers: An Exploratory Study." *International Journal of Logistics Management* 23 (1): 135–58.

Harrington, L. 2015. "Solving the Talent Crisis: Five Alternatives Every Supply Chain Executive Must Consider." *DHL*, http://www.dhl.com/en/logistics/industry_sector_solutions/automotive_logistics/automotive_talent_whitepaper.html (retrieved July 22, 2015).

Hohenstein, N.-O., E. Feisel, and E. Hartmann. 2014. "Human Resource Management Issues in Supply Chain Management Research." *International Journal of Physical Distribution and Logistics Management* 44 (6): 434–63.

Holcomb, M., A. Krul, and D. Thomas. 2015. "Supply Chain Talent Squeeze: How Businesses and Universities Are Collaborating to Fill the Gap." *Supply Chain Management Review*, http://www.scmr.com/article/supply_chain_talent_squeeze_how_businesses_and_universities_are_collaborati (retrieved July 31, 2015).

Holcomb, M. C., S. Liao-Troth, and K. B. Manrodt. 2014. "A Shift in Fundamentals: The Changing Direction in Logistics and Transportation Management." *Transportation Journal* 53 (4): 516–33.

Hurst, J. L., and L. K. Good. 2009. "Generation Y and Career Choice: The Impact of Retail Career Perceptions, Expectations and Entitlement Perceptions." *Career Development International* 14 (6): 570–93.

Keller, S. B., and J. Ozment. 2009. "Research on Personnel Issues Published in Leading Logistics Journals: What We Know and Don't Know." *International Journal of Logistics Management* 20 (3): 378–407.

Knemeyer, A. M., and P. R. Murphy. 2004. "Promoting the Value of Logistics to Future Business Leaders: An Exploratory Study Using a Principles of Marketing Experience." *International Journal of Physical Distribution & Logistics Management* 34 (10): 775–92.

Knemeyer, A. M., P. R. Murphy, and R. F. Poist. 1998. "Do You Think I'm Sexy? Suggestions for Improving the Attractiveness of the Logistics Major." *Journal of Transportation Law, Logistics and Policy* 66 (1): 54–66.

Kristof-Brown, A. L., R. D. Zimmerman, and E. C. Johnson. 2005. "Consequences of Individual's Fit at Work: A Meta-Analysis of Person-Job, Person-Organization, Person-Group, and Person-Supervisor Fit." *Personnel Psychology* 58 (2): 281–342.

Kuechler, W. L., A. McLeod, and M. G. Simkin. 2009. "Why Don't More Students Major in IS?" *Decision Sciences Journal of Innovative Education* 7 (2): 463–88.

Kumar, A., and P. Kumar. 2013. "An Examination of Factors Influencing Students Selection of Business Majors Using TRA Framework." *Decision Sciences Journal of Innovative Education* 11 (1): 77–105.

Luscombe, J., I. Lewis, and H. C. Biggs. 2013. "Essential Elements for Recruitment and Retention: Generation Y." *Education and Training* 55 (3): 272–90.

Malgwi, C. A., M. A. Howe, and P. A. Burnaby. 2005. "Influences on Students' Choice of College Major." *Journal of Education for Business* 80 (5): 275–82.

Marchese, K., and B. Dollar. 2015. "Supply Chain Talent of the Future." *Deloitte*, http://www2.deloitte.com/us/en/pages/operations/articles/supply-chain-talent-of-the-future-survey.html (retrieved August 12, 2015).

McCrea, B. 2015. "What Does the Future Hold for the Supply Chain Work Force?" *Supply Chain Management Review*, http://www.scmr.com/article/what_does_the_future_hold_for_the_supply_chain_work_force (retrieved July 30, 2015).

———. 2016. "4 Innovative Supply Chain Education Trends." *Supply Chain Management Review*, http://www.scmr.com/article/4_innovative_supply_chain_education_trends (retrieved February 8, 2016).

Ng, E. S. W., L. Schweitzer, and S. T. Lyons. 2010. "New Generation, Great Expectations: A Field Study of the Millennial Generation." *Journal of Business and Psychology* 25 (2): 281–92.

Noël, N. M., C. Michaels, and M. G. Levas. 2003. "The Relationship of Personality Traits and Self-Monitoring Behavior to Choice of Business Major." *Journal of Education for Business* 78 (3): 153–57.

Ozment, J., and S. B. Keller. 2011. "The Future of Logistics Education." *Transportation Journal* 50 (1): 65–83.

Pappu, R. 2004. "Why Do Undergraduate Marketing Majors Select Marketing as a Business Major? Evidence from Australasia." *Journal of Marketing Education* 26 (1): 31–41.

Peck, M. L. 2015. "The Future of Supply Management: A Conversation with Two Millennials." *Supply Chain Management Review*, http://www.scmr.com/article/the_future_of_supply_management_a_conversation_with_two_millennials (retrieved September 1, 2015).

Pohlen, T. L. 2011. "Meeting the Challenge of Educating the Transportation and Logistics Professional." *Transportation Journal* 50 (1): 84–90.

Porter, S. R., and P. D. Umbach. 2006. "College Major Choice: An Analysis of Person-Environment Fit." *Research in Higher Education* 47 (4): 429–49.

Ravlin, E. C., and B. M. Meglino. 1987. "Effect of Values on Perception and Decision Making: A Study of Alternative Work Values Measures." *Journal of Applied Psychology* 72 (4): 666–73.

Roach, D. W., R. E. McGaughey, and J. P. Downey. 2011. "Selecting a Business Major within the College of Business." *Administrative Issues Journal: Education, Practice, and Research* 2 (1): 107–21.

Ross, M., C. Gatz, J. Ng, R. Kazis, and N. P. Svajlenka. 2015. "Unemployment among Young Adults: Exploring Employer-Led Solutions" *Brookings Institution*, http://www.brookings.edu/research/reports/2015/07/21-unemployment-young-adults-ross-gatz-kazis-ng-svajlenka (retrieved July 28, 2015).

Ruamsook, K., and C. Craighead. 2014. "A Supply Chain Talent Perfect Storm?" *Supply Chain Management Review* 18 (1): 12–17.

Scott, S., M. Burnette, P. Dittmann, T. Stank, and C. Autry. 2015. "Supply Chain Talent: Our Most Important Resource." *Global Supply Chain Institute*, blog.ryder.com/2015/05/supply-chain-talent-management/ (retrieved August 12, 2015).

Stank, T., C. Autry, P. Daugherty, and D. Closs. 2015. "Reimagining the 10 Megatrends That Will Revolutionize Supply Chain Logistics." *Transportation Journal* 54 (1): 7–32.

Strasser, S. E., C. Ozgur, and D. L. Schroeder. 2002. "Selecting a Business College Major: An Analysis of Criteria and Choice Using the Analytical Hierarchy Process." *American Journal of Business* 17 (2): 47–56.

Terjesen, S., S. Vinnicombe, and C. Freeman. 2007. "Attracting Generation Y Graduates: Organisational Attributes, Likelihood to Apply and Sex Differences." *Career Development International* 12 (6): 504–22

Turner, S. E., and W. G. Bowen. 1999. "Choice of Major: The Changing (Unchanging) Gender Gap." *Industrial and Labor Relations Review* 52 (2): 289–313.

Twenge, J. M., W. K. Campbell, and E. C. Freeman. 2012. "Generational Differences in Young Adults' Life Goals, Concern for Others, and Civic Orientation, 1966–2009." *Journal of Personality and Social Psychology* 102 (5): 1045–62.

Twenge, J. M., S. M. Campbell, B. J. Hoffman, and C. E. Lance. 2010. "Generational Differences in Work Values: Leisure and Extrinsic Values Increasing, Social and Intrinsic Values Decreasing." *Journal of Management* 36 (5): 1117–42.

Walstrom, K. A., T. P. Schambach, K. T. Jones, and W. J. Crampton. 2008. "Why Are Students Not Majoring in Information Systems?" *Journal of Information Systems Education* 19 (1): 43–54.

Wong, Z. 2015. "Student Attitudes toward Information Systems Management as Major and Career Options." *International Journal of Information and Education Technology* 5 (6): 409–13.

Worthington, A., and H. Higgs. 2004. "Factors Explaining the Choice of an Economics Major: The Role of Student Characteristics, Personality and Perceptions of the Profession." *International Journal of Social Economics* 31 (5/6): 593–613.

Wowak, K. D., C. W. Craighead, D. J. Ketchen Jr., and G. T. M. Hult. 2013. "Supply Chain Knowledge and Performance: A Meta-Analysis." *Decision Sciences* 44 (5): 843–75.

Zhang, W. 2007. "Why IS: Understanding Undergraduate Students' Intentions to Choose an Information Systems Major." *Journal of Information Systems Education* 18 (4): 447–58.

• Attracting Students to the Field of Logistics, Part 2

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Abstract

The significant shortage of supply chain and logistics (SC/L) professionals continues to worsen, so it is imperative that we understand how to attract more college students to the field. Part 1 of this series revealed the characteristics of logistics industry jobs that are most likely to attract students. In part 2, we now explore specifically why SC/L majors are drawn to the field so that we can understand how to strengthen this pool of majors and attract students from other majors. The results from two survey data sets reveal that SC/L majors retain a relatively unique profile, drawn to the field primarily by intrinsic (e.g., challenge, problem solving, interest) and extrinsic (job availability, pay, career options) characteristics. They are also more strongly influenced by professors and their school's reputation than other business majors. Cluster analysis reveals that some students from