Southern Business Review

Volume 32 | Issue 1 Article 3

September 2006

Who's Running This Operation?

Jacob V. Simmons
Georgia Southern University

Who's Running This Operation?

Jacob V. Simons

In 1999, the Bureau of the Census documented approximately 35,125 businesses in the 58-county region of southeast Georgia. Each of these businesses provides some combination of goods and services by transforming labor, capital, material, and information inputs into outputs that have value to their customers. This transformation process is called the company's "operations". Since, by definition, all businesses conduct operations, they must also employ people who manage those operations.

However, a review of business degrees granted within the state of Georgia reveals that few degree programs exist to produce operations managers and that only a small handful of graduates emerge from those programs each year. According to the University System of Georgia's (2004) Student Information Reporting System, 5,751 bachelor's degrees in business were granted by Georgia's state universities in FY03. Only 16 of those degrees (0.28%) specialized in operations management. By contrast, approximately 12.4 percent specialized in accounting, 18.6 percent in finance, and 19.8 percent in marketing.

An obvious question would seem to be "If not those educated in operations management, who's running the operations of businesses in our region?" The answer to this question has important implications for business executives faced with hiring decisions, educational institutions seeking to provide relevant programs, and students seeking to become qualified job candidates. Accordingly, the objectives of this research were to determine a) the educational backgrounds of current operations managers and b) the relative contribution of their education in helping them meet the challenges of their jobs.

Dr. Jacob V. Simons is professor of quantitative analysis, Georgia Southern University, College of Business Administration, Department of Finance & Quantitative Analysis, Statesboro, GA 30460-8151.

Literature Review

There is substantial recognition of the importance of the operations management function in business (Andrew & Johnson, 1982; Skinner, 1973), whether in manufacturing (Taj, Hormozi, & Mirshab, 1996) or in service industries (Armistead, Johnson, & Voss, 1986). Consequently, there have also been many studies of operations management education throughout the world (Ala, 1987; Bahl, 1989; Basnet, 2000; Berry, 1979; Berry, Watson, & Greenwood, 1978; Bregman & Flores, 1991; Chase & Zhang, 1998; Goffin, 1998; Hill, 1987; Machuca & Luque, 2003; Morgan, 1989; Raiszadeh & Ettkin, 1989; Wild, 1984; Wood & Britney, 1988/1989). Most of these studies, however, have focused on the content of operations management curriculum. In other words, these studies have started with an existing or presupposed

degree program and worked forward in time to consider how to make that program more helpful to future operations managers. By contrast, the proposed study starts with current managers of operations and looks backward at the educational and other preparatory experiences that led them to their current positions.

The disconnect between the number of operations managers and the production of operations management majors by universities is not unique to Georgia. For example, as part of a process of on-going improvement, AACSB International (the Association to Advance Collegiate Schools of Business) expects its accredited members to seek input from multiple stakeholders and to use various forms of assessment to determine how well they are serving their customers (AACSB 2005). This is typically done through surveys of current students, graduates, and employers of graduates. However, such methods are limited to assessment of customers that have already been served. These customers may or may not be representative of the region's businesses in general. By targeting existing operations managers, regardless of any prior affiliation with the author's university, the current study addresses a known need of business that is apparently NOT being directly addressed by targeted programs.

Methodology

A single-page survey completed by the person most recently hired into an entry-level operations management position in target organizations was used. The survey was tested to ensure it could be completed in less than five minutes without reference to other data sources. The survey (see Appendix) solicited the type and source of the respondent's undergraduate degree, other experience that was considered key in qualifying them for their present position, and the extent to which their education has helped them accomplish their jobs. A cover letter gave a brief description of the project's intent, identified the intended recipient, and requested the cooperation of the *actual* recipient in forwarding the survey, if necessary. To enhance the response rate, the cover letter also included an assurance of anonymity and an offer to receive survey results.

The survey was mailed to Georgia businesses in the manufacturing, retail, services, transportation, and wholesale sectors, using contact data obtained from the ReferenceUSA database. ReferenceUSA was considered to be the most complete business directory for the target population because its data is obtained from numerous, complementary sources and verified semi-annually by phone (infoUSA, 2005). Mailings were limited to those businesses with 100 or more employees, in the belief that smaller businesses would be less certain to hire someone for the sole purpose of managing their operations. A postage-paid return envelope was included and bar-coded to allow correlation of responses with industry sectors.

Responses were then tabulated using simple descriptive statistics to summarize the responses and look for apparent patterns. Since most of the data was nominal, Chi-square tests were applied to determine the significance of differences across groups. (In cases where a comparison involved cell sizes equal to or nearly zero, we treated the Chi-square results as being a matter of information, rather than strictly valid.) In the remainder of this paper, the results of these analyses are synthesized to formulate general statements concerning the types and value of preparation possessed by managers of the responding operations.

Results

In this section, the target population and survey respondents are described. Then, the results for survey Questions 2-5, which address the first research objective of determining the educational backgrounds of operations

managers are presented. Finally, responses to survey Questions 11-13, which address the relative contribution of the respondents' education in helping them meet the challenges of their jobs, are presented and analyzed.

The Population and Respondents

Approximately 3,878 surveys were mailed to the target population described in the previous section. Table 1 characterizes this population in terms of business sector and numbers of employees.

A total of 237 useable responses were received. The low overall response rate was expected due to the increasing reluctance of business managers to respond to unsolicited surveys. In addition, we opted to forego follow-up actions that might have increased the response rate so that we could use our entire fixed budget to send surveys to the complete population, rather than just a sample. Although a higher response rate is always desirable, the number of responses was sufficient to provide interesting and valuable results.

The respondents are characterized in Table 2. Throughout the paper, whenever the Chi-square test indicated the distribution of results to be non-random, unusually high and low observations are highlighted with bold and italicized font, respectively. Table 2 indicates that the services sector and larger businesses (300 or more employees) appear to have been over-represented among the respondents, while the retail trade sector and smaller businesses (100-199 employees) were under-represented; however, nothing readily explains these observations.

Table 1
Target Population

American Business Disk Sectors	100-199	200-299	300 +	Total	Percent of Total
Manufacturning	448	171	309	928	23.9
Retail Trade	827	193	165	1185	30.6
Services (excl. Education)	736	177	289	1202	31.0
Transportation	143	52	67	262	6.8
Wholesale/Distributors	162	62	77	301	7.8
Total	2316	655	907	3878	100.0
Percent of Total	59.7	16.9	23.4	100.0	

Table 2
Breakout of Respondents

Survey Responses by Sector and Size	100-199	200-299	300+	Total	Percent of Total	Respondents as % of Population
Manufacturning	24	11	32	67	28.3	7.2
Retail Trade	19	4	4	*27*	*11.4*	*2.3*
Services (excl. Education)	55	19	33	**107**	**45.1**	**8.9**
Transportation	11	3	1	15	6.3	5.7
Wholesale/Distributors	4	6	11	21	8.9	7.0
Total	*113*	43	**81**	237	100.0	6.1
Percent of Total	*47.7*	18.1	**34.2**	100.0		
Respondents as % of	*4.9*	6.6	**8.9**	6.1		

Educational Backgrounds of Current Operations Managers

Collectively, questions 2-5 addressed the first research objective of determining the educational background of current operations managers. Responses to question #2 showed that over 80 percent of the respondents had at least a bachelor's degree and over 30 percent had even higher levels of education. These results were not significantly different across business sectors. The responses to question #3 (Table 3) indicated that almost twice as many respondents had business degrees as had the next most common type of degree. As expected, the number of engineers employed to manage operations was significantly high in the manufacturing sector, but significantly low in the Services sector.

Table 4 provides a more detailed breakout of academic backgrounds, according to the academic majors identified in the survey's fourth question. Not surprisingly, the presence of industrial engineers is significant in manufacturing, while health/medical majors abound in the Services sector.

On question #5, 79 percent of the respondents indicated that their highest degree had been awarded by a public institution. Interestingly, 62 percent of these degrees were earned outside the state of Georgia.

The Contribution/Value of Educational Background

The second research objective, concerning education's value, was addressed via survey questions 11-13. Question #11 took a relative approach to the issue, by asking respondents to rank order the value of five attributes in helping them succeed in their current position. Those attributes were their high school diploma, the fact that they have a college degree, the type of college degree, their college major, and their work experience. Not surprisingly, prior work experience was most often ranked first (most valuable). The type of degree possessed was most often ranked second in value. It is reasonable to assume the perceived value of the degree might depend upon the type of degree the respondent had. Table 5 provides data for this type of additional analysis. Respondents with liberal arts degrees ranked their degrees as fourth most important far more frequently than expected, if responses were assumed to be randomly distributed. In general, those with education and liberal arts

Table 3
Results for Question #3: Type of Degree

Observed responses		Business (e.g., B.B.A., M.B.A.)	Education (e.g., B.S.Ed., M.Ed.)	Engineering (e.g., B.S._E., M.S._E.)	Liberal arts (e.g., B.A., M.A.)	Social or "hard" sciences (e.g., B.S., M.S.)	Sum
Manufacturing		24	0	**20**	3	8	55
Retail Trade		12	1	1	0	5	19
Services		33	5	*3*	11	23	75
Transportation		3	1	5	1	2	12
Wholesale/Distributors		7	0	3	3	2	15
	Overall	79	7	32	18	40	176

Table 4
Results for Question #4: Academic Major

Observed responses	Management	Marketing	Operations/production	Statistics/quant analysis	Finance	Accounting	Electrical Engineering	Chemical engineering	Industrial engineering	Health /medical	Law	Sum
Manufacturing	16	0	1	0	2	5	0	4	**13**	*0*	1	42
Retail Trade	8	1	0	0	2	2	0	0	1	0	0	14
Services	25	4	0	1	3	1	0	0	*0*	**23**	3	60
Transportation	0	0	0	0	**2**	0	**2**	0	1	0	0	5
Wholesale/Distributors	8	0	1	0	0	0	0	1	1	0	0	11
Overall	57	5	2	1	9	8	2	5	16	23	4	132

Table 5
Reported Value of Respondent's Own Degree Type (1 is best)

	Relative value/rank (Q11c)					
Type of degree (Q3)	**1**	**2**	**3**	**4**	**5**	**Sum**
Business (e.g., BBA, MBA)	16	24	23	7	7	77
Education (e.g., BSEd, MEd)	0	2	3	0	2	7
Engineering (e.g., BS_E, MS_E)	7	15	9	1	0	32
Liberal arts (e.g., BA, MA)	0	1	4	**10**	1	16
Social or "hard" sciences (e.g., BS, MS)	7	10	11	9	2	39
Sum	30	52	50	27	12	171

degrees ranked their degrees as less valuable than did other respondents.

Overall, the respondent's particular academic major was most often ranked as the third most valuable background factor from among those listed; however, those in the manufacturing sector placed significantly lower value on their academic majors. (Academic major ranked fourth in value as often as it ranked third among manufacturing respondents, while respondents overall ranked it third twice as often as they ranked it fourth.) As in the previous case, the question is raised whether this was a function of the particular major the respondent possessed. Therefore, in Table 6, the results of Questions #4 and #11 are set forth for respondents from the manufacturing sector only. (Since the numbers are small, we condensed similar majors.) Over half of the fourth place rankings came from engineering majors, who comprised less than half of the respondents in this sector.

Taking a more absolute perspective, Question #12 asked the extent to which the respondent's education has prepared them to succeed. Since no tradeoff was forced, it was expected that most responses would be positive, which they were. 33.5 percent of respondents said their education had prepared them "extremely well" and another 55.5 percent chose the response "moderately well." Other than the appearance of statistical significance due to small (or zero) cell sizes, the results did not differ according to either type of degree or academic major.

While questions #11 and 12 dealt with the perceived value of the respondents' *current* backgrounds, question #13 addressed *potential* preparation. Given their first-hand knowledge of the demands of a position in operations management, question #13 asked the respondents' to ascertain the *potential* value of an academic major in operations management. The stated topic of our project created the possibility of a positive response bias; however, the overwhelming strength of the responses was surprising, especially given the majority of the respondents had just indicated that their own academic degree (usually NOT operations management) and major has been valuable and prepared them well for their current positions. Over 70 percent of the respondents said that a major in operations management would be "very valuable" and another 27 percent more said it would be "slightly valuable." Chi-square tests showed these results to be independent of the respondent's own type of degree or business sector.

The breakout of Question #13 responses by specific academic major, as shown in Table 7, is especially

interesting, however. Even taking into account the effects of small cell sizes, respondents who had majored in industrial engineering were *more* positive about the potential value of an operations major than were respondents with other majors. What makes this so interesting is that the industrial engineering major may be the closest to operations management in terms of content. (Industrial engineering is somewhat more technical in focus, while operations management is more managerial.) So it seems reasonable to believe that this group of respondents may be the most knowledgeable of how an OM major would differ and, therefore, its potential value.

Table 6
Reported Value of Respondent's Own Major (Manufacturing Sector)

Q4 vs. Q11d			Q11d rankings					
			1	**2**	**3**	**4**	**5**	**Sum**
Q4 majors	1,4	Management (incl. ops)		2	8	4	3	17
	6,7,...	Acc't, Finance, Other Bus		1	5	4	1	11
	9,10,...	Industrial & other engineering	3	4	6	12	1	26
		Misc	2	1	1	1		5
		Sum	5	8	20	21	5	59

Table 7
Value of an OM Major vs. Respondent's Academic Major

	OM value (Q13)			
Academic major (Q4)	**1**	**2**	**3**	**Sum**
Management	0	19	38	57
Marketing	0	3	2	5
Operations/production	0	0	2	2
Statistics/quant analysis	**1**	0	0	1
Finance	0	1	8	9
Accounting	0	2	6	8
Electrical engineering	0	1	1	2
Chemical engineering	0	**4**	*1*	5
Industrial engineering	1	*0*	**15**	16
Health/medical	1	5	16	22
Law	0	1	3	4
Sum	3	36	92	131

Discussion & Conclusions

The preliminary fact-finding that motivated our research showed that Georgia's public universities are producing very few operations management graduates. Although a majority of the respondents received their degrees from somewhere other than Georgia, our results indicate that Georgia's businesses do *not* appear to be importing *operations majors*. Instead, business operations are apparently being managed by people with other academic backgrounds. In the manufacturing sector, engineers are prominent. Elsewhere, the most common type of degree is in business and the most common major is management. This would seem to support the perception that a management major is flexible.

In general, the respondents considered their prior work experience to be most valuable in helping them succeed, followed by the type of college degree they possess, and then their particular academic major. Degrees in liberal arts and industrial engineering majors in the manufacturing sector reported to be of less value than others. A vast majority (89%) of all respondents said that their education had prepared them extremely or moderately well for their duties; however, more than two-thirds of respondents (regardless of their own educational background) said a major in operations management would be very valuable for their current position. Almost all the rest said it would be slightly valuable.

As mentioned previously, a limitation of this study is that small cell sizes preclude the assurance of statistical significance for some of the comparisons reported. Even so, the results suggest or support several potential future research opportunities.

One such need concerns the determination of specific knowledge and skill areas that are either well-supported or not by the educational backgrounds reported here. In other words, it would seem appropriate to confirm whether operations management programs offered by the state system more closely match relevant job dimensions than do the programs taken by current operations managers.

In addition, future research would be helpful in exploring current hiring practices. For example, what educational backgrounds do employers consider most desirable in candidates for operations management positions and how important a criterion is educational background? Of specific interest are the questions of whether employers currently desire/seek candidates with operations management experience and, if not, why not?

Finally, further analysis could be helpful to look at the effects of career progression and timing. It would be interesting to explore the longitudinal tradeoff between academic background and work experience. For example, how does the relative value of a particular degree decline as an employee gains experience? Also, since many of the respondents may have entered operations from lateral career paths, it would be interesting to determine whether these represent permanent transitions or temporary digressions, e.g., to broaden experience. If the latter, when do the digressions occur and for how long? And what is the impact on the business's operations of the associated learning curves and turnover?

Answers to these questions should help educators do a better job of giving businesses the kind of employee really needed to run their operations.

Acknowledgements

The author wishes to acknowledge and thank

Soli Deo Gloria

Georgia Southern University's College of Business Administration funding for a summer research grant

The College's Bureau of Business Research & Economic Development for its assistance, particularly,

Bureau Director Phyllis Isley, for her enthusiastic offers of assistance, and Research Associate Jeremy Hill, for having accomplished or supervised the majority of the survey's administration.

References

AACSB International (2005). *Eligibility procedures and accreditation standards for business accreditation*. Tampa, FL: AACSB International – The Association to Advance Collegiate Schools of Business.

Ala, M. (1987). How students perceive the benefits of studying production and operations management. *Production and Inventory Management Journal*, 28(4), 71-74.

Andrew, C. G., & Johnson, G. A. (1982). The crucial importance of production and operations management. *The Academy of Management Review*, 7(1), 143-147.

Armistead, C., Johnston, R., & Voss, C. A. (1986). Introducing service industries in operations management teaching. *International Journal of Operations & Production Management*, 6(3), 21-29.

Bahl, H. C. (1989). Teaching production and operations management at the MBA level – A survey. *Production and Inventory Management Journal*, 30(3), 5-7.

Basnet, C. (2000). Production management in New Zealand: Is education relevant to practice? *International Journal of Operations & Production Management*, 20(6), 730.

Berry, S. (1979). Practitioners' views on the importance of selected production management topics. *Production and Inventory Management Journal*, 21(3), 1-17.

Berry, S. E., Watson, H. J., & Greenwood, W. T. (1978). A survey as to the content of the introductory POM course. *Academy of Management Journal*, 21(4), 699-714.

Bregman, R. L., & Flores, B. E. (1991). OM curriculum: Challenges for the 1990s and beyond. *Operations Management Review*, 8(2), 47-55.

Bureau of the Census. (1999). *County business patterns, Georgia, 1999*. Washington, DC: U. S. Department of Commerce.

Chase, R. B. & Zhang, A. (1998). Operations management: Internationalization and interdisciplinary integration. *International Journal of Operations & Production Management*, 18(7), 663.

Goffin, K. (1998). Operations management teaching on European MBA programmes. *International Journal of Operations & Production Management*, 18(5), 424.

Hill, T. J. (1987). Teaching and research directions in production/operations management: The manufacturing sector. *International Journal of Operations & Production Management*, 7(4), 5-12.

infoUSA. (2005). *About Us*. Retrieved November 29, 2005, from http://www.referenceusa.com/au/au.asp?si=7205824703336 6.

Machuca, J. A. D., & Luque, R. A. (2003). An empirical study of POM teaching in Spanish universities (I): Content of POM courses. *International Journal of Operations & Production Management*, 23(1), 15.

Morgan, C. (1989). Achieving academic and practitioner objectives in the basic POM survey course. *Production and Inventory Management Journal*, 30(2), 48-51.

Raiszadeh, F. M. E., & Ettkin, L. P. (1989). POM in academia: Some causes for

concern. *Production and Inventory Management Journal*, 30(2), 37-40.

Skinner, W. (1973). After seven lean years production and operations management 1973. *Academy of Management Journal*, August, 556.

Taj, S., Hormozi, A. M., & Mirshab, B. (1996). Undergraduate academic teaching and manufacturing industry requirements: A comparative analysis. *Interfaces*, 26(3), 51-57.

University System of Georgia. (2004). *Degrees and awards conferred fiscal year 2003*. Retrieved January 31, 2004, from http://www.usg.edu/sra/students/degrees/02-03/deg_confer03.pdf.

Wild, R. (1984). Survey report: The responsibilities and activities of UK production managers. *International Journal of Operations & Production Management*, 4(1), 69-74.

Wood, A. R., & Britney, R. R. (1988/1989). Production operations management: Research and teaching opportunities in the 1990s. *Operations Management Review*, 7(2), 33-42.

Appendix

40433

Educational Profile for Operations Managers

Directions: On each of the following items, please select or provide the response that most accurately describes the education and experience you had when you were hired into your present operations management position. All responses will be anonymous and the one-page questionnaire can easily be completed in less than five minutes.

1. Please write down your current job title: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

2. Please indicate your highest level of education:

O Elementary school	O Some college	O Bachelor's degree
O Some high school	O Certificate	O Master's degree
O High school graduate	O Associate's degree (two-year)	O Doctoral degree

3. If you have a college degree, please indicate the type of degree you received at the highest level of education:

O Business (e.g. B.B.A., M.B.A)	O Liberal arts (e.g. B.A., M.A.)
O Education (e.g. B.S.Ed., M.Ed.)	O Social or "hard" sciences (e.g. B.S., M.S.)
O Engineering (e.g. B.S._.E., M.S._.E.)	Other (specify): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

4. If you have a college degree, please indicate the academic major or area of specialization that you recieved at the highest level of education:

O Management	O Statistics/quantitative analysis	O Chemical engineering
O Marketing	O Finance	O Industrial engineering
O Logistics	O Accounting	O Health/medical
O Operation production	O Electrical engineering	O Law

Other (specify) ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

5. If you have a college degree, please indicate the type of institution from which you received your highest degree:

O a public college or university in Georgia	O a public college or university outside Georgia
O a private college or university in Georgia	O a private college or university outside Georgia

6. If you have a college degree, please specify the university from which you earned your highest degree:

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

7. How long ago did you earn your highest level of education?

O less than 1 year O 1-5 years O 6-10 years O 11 or more years

8. Please indicate where you came from when you were hired into your current position:

O hired directly out of school/university	O hired from a comparable position in another company
O promoted from within the company	O hired from a lower level position in another company

O rotated from other functions within the company, as part of a career broadening program

9. How many years of experience did you have working in or managing operations when you were hired into your present position?

☐☐ YEARS

10. Besides operations, in what other business functions have you worked? (Mark all that apply)

O Accounting	O Logistics/distribution	O Research & development
O Finance	O Management	O Information systems
O Human resources	O Marketing	O None

Other (specify): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

11. Please rank order the relative value of each of the following in helping you be successful in meeting the demands and challenges of your current position **(1 is the most important and 5 is least important)**:

☐ Having a high school diploma
☐ Having a college degree, regardless of type or specialty
☐ Having the type of degree (e.g. business, engineering) you have
☐ Having a degree in your particular academic major or specialty
☐ Your prior work experience

12. How well has your highest level of education prepared you to succeed in your current job?

O not at all O very slightly O moderately well O extremely well

13. How valuable do you think it would be for someone who is assigned to your current position to have a college degree with a major in operations management?

O Not valuable O Slightly valuable O Very valuable

**Please return your response in the enclosed postage-paid envelope within five days.*
(If you would like to receive a copy of our project's findings, just enclose a business card.)