
AC 2011-2795: SATISFYING THE MULTIPLE STAKEHOLDER REQUIREMENTS OF ENGAGED SCHOLARSHIP: THE CASE OF INDUSTRIAL DISTRIBUTION AT TEXAS A&M

William J. Sawaya, Texas A&M University

William J. Sawaya is an Assistant Professor in the department of Engineering Technology and Industrial Distribution in the Dwight Look College of Engineering at Texas A&M University. He teaches courses in quality management and process improvement. He has done work and research on the topics of inter-organizational collaboration, inventory management, new product development, product introduction, healthcare products, transportation systems analysis-focusing on railroads and multi-mode container operations, product testing, customer satisfaction, quality management, facility location, and sustainability. Prior to joining the faculty at Texas A&M he was a Post Doctoral Associate at Cornell University in the Transportation Systems and Management group of the School of Civil and Environmental Engineering. His Ph.D. is from the Carlson School of Management at the University of Minnesota with an emphasis in Operations and Management Science. He has a M.S. in Industrial and Systems Engineering from the Georgia Institute of Technology and a B.S. in Manufacturing Engineering from Brigham Young University.

Satisfying the Multiple Stakeholder Requirements of Engaged Scholarship: The Case of Industrial Distribution at Texas A&M

Abstract

Engaged scholarship seeks to bring academia and the corporate world closer together by focusing on issues and problems that are relevant. By their very nature, disciplines such as engineering and business should be inherently engaged in these endeavors. Engineering education is a complicated process with myriad stakeholders with various, and sometimes competing, objectives and trade-offs. These objectives and their trade-offs often give rise to the subordination of some objectives to others that are judged to be more important or core to a particular school's mission. If some objectives are not given enough emphasis then certain issues, such as the relevancy of coursework or of academic research may be called into question. Further, the inherent interconnectedness of the various stakeholders in the education process exhibits the properties of a complex system. This is clear through the interactions between adjustments in objectives and the non-linear behavior of the emergent system behavior from system changes. The stakeholders in the process of engineering education are identified as customers of the system, and within this context, their various requirements for satisfaction are outlined and contrasted. Certain inherent trade-offs between prioritizing different objectives are also discussed. A framework for managing the various customer requirements in the engineering education context is developed. This framework emphasizes focusing on the synergies between the various customers' requirements which can lead to superior system outcomes. The case of Industrial Distribution at Texas A&M University is presented as an example implementation of this framework.

Introduction

Hughes et. Al explores academic/practitioner engagement by undertaking interviews with academicians, practitioners and other experts with relevant experience in engagement^[1]. They address the questions like how academics are in general meant to keep in touch with the reality of business practice and how younger academics develop the experience or expertise to operate effectively. Van De Ven and Johnson proposed a method of engaged scholarship for addressing the knowledge production problem, arguing that engaged scholarship not only enhances the relevance of research for practice but also contributes significantly to advance research knowledge in a given domain^[2].

Stakeholders are defined as any group or individual who can affect or is affected by the achievement of the organizations objectives^[3]. The stakeholder theory was well detailed by Edward Freeman. Stakeholder theory argues that firms address not only investors, employees, suppliers and customers but also other parties like government, political groups, prospective employees, trade associations, and competitors and so on. Recent scholarly work on stakeholder theory was by Donald and Preston who argue that the normative base of the theory is the core of the stakeholder theory^[4]. The role of stakeholder management with respect to creating value in transnational higher education was discussed by Bolton and Nie. They define the stakeholders associated with delivering transnational higher education services and they discuss how the interests of stakeholders are constantly varying^[5].

Stakeholders of an Academic Engineering or Business Program

Within any academic program the number of different types of stakeholders is large, perhaps larger and more diverse than it might first appear. It is not uncommon for engineering and business programs to consist of at least the following groups of stakeholders: undergraduate students, graduate students, professional students, the organizations that hire undergraduate or graduate students, organizations directly benefiting from applied research, organizations indirectly benefiting from theoretical or applied research, discipline specific community, the university itself, colleges within universities, academic departments or programs, the academic and scholarly community, society in general – both globally and locally, the faculty, and staff members supporting the program. Each of these stakeholders has their own set of objectives, and any decision made in administering or changing the academic program will impact the stakeholders in different ways. Even things as simple as reallocating how faculty members or staff members spend their time can have a significant impact on the objectives for different stakeholders. In many cases, things that will be of benefit to one stakeholder might be beneficial to all the stakeholders. But in other cases there are things that might be of benefit to one stakeholder that severely, and negatively, impact another stakeholder. The example of faculty and how they allocated their time is an easy illustration. Allocating more faculty time to teaching undergraduate students is likely better for the students, and better for the companies hiring them (assuming that the faculty members are adding value when they teach), but it could be having a very negative impact on that faculties' research output, their ability to secure grants, and their contribution to the academic and scholarly community. Eventually, these deficits could even harm the students themselves directly.

There follows a brief discussion of a typical representation of the objectives of some of the key stakeholders which have just been enumerated, and are summarized in Table 1. Engaged scholarship advocates argue the benefits of integrating practical knowledge within the educational process. An example of how principles of engaged scholarship is being conducted in the Industrial Distribution Program at Texas A&M University is presented. While this program is not perfect, it does an excellent job at considering many of the stakeholders and at exploiting synergies in provide outstanding service to many of them.

Undergraduate Students

In many ways undergraduate students (or their parents) are the clearest and most obvious stakeholders within the academic community. Many universities have, or have had, a focus on undergraduate education. Therefore an omission of the expectations of undergraduate students would be remiss, even though this mission is different at different types of academic institutions. Repeated discussions with senior undergraduate students as part of class discussions on quality have yielded the following objectives. First, to gain practical (and some theoretical) knowledge. Second, to be able to find a job; preferably a job that is the field that they have studied and one that pays well. Third, to have a positive and enjoyable learning environment; which is a function of many things including: the course instructor, access to the course instructors, classmates, the classroom environment, the physical location and facilities, course materials, and even course topics. Fourth, to gain practical insight or practical experience that will prepare them for their jobs or their careers as part of the educational process. Fifth, to obtain these things at a

reasonable cost and a cost that is a good value for the students (or whomever is funding their education). There may be many other objectives depending on individual students, programs, or universities.

Table 1 Major objectives of primary stakeholders in an engineering or business program

Stakeholders	Main Objectives
Undergraduate Students	Knowledge to add value, to find valuable jobs, good instruction
Graduate Students	Advanced knowledge to add value to real problems, good instruction
Professional Students	Knowledge and tools to add value to real problems, good instruction
Organizations Hiring Students	Employees with valuable skills and knowledge at a reasonable cost
Organizations Using Research Solutions	Practical solutions that have impact that affects the their bottom line
University: Colleges and Departments	Prestige for the university, research dollars, teaching, service
Academic and Scholarly Community	Academic and generalizable knowledge, service to societies, reviews
Society: Global, and Local Communities	Positive and sustainable contributions
Faculty	Prestige, income, fulfillment, time for research and seeking funding
Staff	Income, fulfillment, positive work environment

Graduate Students

Graduate student needs can be summarized as being the same as those of the undergraduates only more so. In general, graduate students are paying more, and therefore need more value in return. But otherwise their objectives are roughly the same. However, the function that will satisfy their needs might be somewhat different. For instance, for graduate students who have specific knowledge needs, there may be a desire or need for more personalized attention from faculty or more specialized dedication of resources, such as laboratories in order to fill their needs.

Professional Students

Professional students are generally interested in knowledge that will help them perform better at jobs that they currently hold. They may also be interested in obtaining certificates or certifications that might increase their earning potentials or allow them to switch jobs. But in either case, the practical nature of the additional knowledge that they seek is paramount. Therefore, it is generally better if instructors of professional education have sufficient practical knowledge to be able to provide value to professional students seeking additional training.

Companies Hiring Students

In some respects the objectives of organizations that are hiring students is not that dissimilar with those of the undergraduate students themselves. They are interested in students that have been well trained and have knowledge and skills that will be of benefit to the hiring organization. The more that the students know, and the more exposure they have to practical problems, the better prepared they are for the companies who may consider hiring them. However, in one respect their objective is different. While students are generally interested in getting as much money as

they can when they are hired, organizations are generally interested in getting the best students that they can at the lowest cost to the company. So in general there will always be something of a tradeoff between this objective of the students and organizations that hire them.

Companies Using Research Solutions

Faculty members and researchers in some programs and universities engage in applied research projects which should bring direct benefits to organizations who may even be compensating the faculty or the university for the research. They are therefore in obvious competition for the time of the researchers. Even academic research that is not as applied may benefit organizations. However, it is likely that there is a correlation between time that the researchers spend interfacing with the organizations who are the ultimate consumer of the research and how applicable it is to their needs. In either case, whether they are benefiting from research results directly or indirectly, the more time that the researchers can devote to interactions with the organizations, the higher the probably value to the organizations.

University: Colleges and Departments

The educational institutions themselves have varied interests and priorities. Entire books could be, and have been written on their objectives. However, there is an interest in doing everything well. But since there are not generally resources to achieve excellence in every area they would like, they are forced to prioritize. Over the last few years there has been an intense push at engineering schools to maximize the research dollars that the faculty brings into the universities' coffers, and that is the definite priority at most top schools. Research publications are also important with teaching and service a distant third in many cases. Departmental objectives may be different than those of the college or universities in which they reside. But it is clear that the objectives of the administration are likely multi-faceted and highly complex.

Academic and Scholarly Community

The contributions to the academic and scholarly community generally come as the faculty publish their research results or engage in academic service. This service can also increase the prestige of the university in general, but it also takes the time of the faculty away from other things. Key ways in which faculty serve the broader academic communities are as gatekeepers to research integrity as reviewers, and editors for academic journals and conferences. They also serve as officers in academic and professional societies and assist in organizing and running academic conferences.

Society: Global, and Local Communities

The biggest benefits to society are undoubtedly the knowledge that is passed on to the students and the knowledge generated by research initiatives. It might also be argued that ethical principles that are imparted or not to students or exercised by programs and faculty have important societal externalities. But in a practical sense, everything done by those affiliated with the program has a societal impact. The potential impact is limited only by the responsibility and resources available to the individuals and the organizations that they work for or that they lead.

Consideration of the societal impact of actions can increase sensitivity to how actions will impact society.

Faculty

Faculty members are one of the more complex stakeholders. The objectives are relatively straight forward, but the prioritization from faculty to faculty member can be very different. In many cases they have also chose academics rather than a career in industry for a reason other than pure economic gain. So they place value on intangibles such as service, flexibility, and freedom to some extent. But they also want to make money, they want to be able to do interesting research and publish the results, and many of them are interested in teaching and performing service for the academic community or society in general. But there is a sufficiently diverse set of goals, and what the faculty members choose to do impacts every other stakeholder significantly, so that account for the faculty is key in any strategy regarding the positioning of any plan in higher education.

Staff

Staff members working within programs and departments are probably often overlooked as stakeholders. Because their training is often less specialized than that of the faculty they might not be held in the same regard. Yet they often have a huge stake in what happens because they depend on the program for their livelihood. They have a vested interest in making a reasonable wage, and in having a positive work environment. They also exert a significant impact on the way in which an academic program runs. And their needs are no less important than any other groups. It is also worth noting that they will generally not have the same concerns as other stakeholder groups. For instance, they are not likely to be as concerned about research projects or faculty research output in spite of the fact that these things have at least an indirect effect on them.

Competing Objectives

As has already been mentioned, the real issue here is that each of the different constituent groups may have objectives that are in competition with each other. For instance, in order to give undergraduate students good practical experiences it requires that faculty members cultivate and maintain relationships with companies. But time spent maintaining such relationships and administering these types of learning experiences could be allocated elsewhere at greater specific benefit to the faculty member. Even though these types of activities are generally regarded as being great for the students, faculty are rarely recognized or explicitly rewarded for the effort they put towards the establishment of these types of programs.

The Industrial Distribution Program at Texas A&M University

The Industrial Distribution Program at Texas A&M University, part of the Department of Engineering Technology and Industrial Distribution graduates 150-200 students a year who have been taught a combination of engineering and supply chain management related skills. The graduates enjoy a high placement rate and decent salaries for their training and background.

Most of the jobs taken by graduates are in the areas of technical sales, sales engineering, logistics, supply chain management, procurement, and operations management. Many of graduates enter management training programs and end up managing sales teams, warehouses, and with significant operations responsibilities within one to three years of graduation. Recruiters who come regularly have claimed that graduates of the program are several years ahead of other hires and advance several years faster to positions of responsibility. There have been cases where graduates are making decisions in the distribution of millions of dollars of inventory within their first year on the job after graduation. Students are regularly placed in a diverse set of industries including transportation and logistics, distribution, oil and gas, fluid power, industrial electricity, electronics, automotive, aerospace, defense, pharmaceuticals, healthcare and consulting with an emphasis on industrial distribution and business to business channels.

There is greater demand for students to enter the major than the major can currently accommodate. One of the reasons that this is the case is the extent to which the program has been able to integrate ideas of engaged scholarship into the curriculum by considering multiple stakeholders of the program.

The depicted diagram in Figure 1. shows the relationship between the various services performed in the program as a cycle of engagement. The whole point is emphasizing how the various components of teaching and research are mutually reinforcing and enhance both the educational experience offered to students, and the skill sets they can then employ in the services of their companies once they have found jobs. It is specifically worth mentioning a few specific ways in which academics within the Industrial Distribution program are closely intertwined with partners who hire graduates, sponsor education, and fund applied research projects. One of the biggest keys is the Professional Association for Industrial Distribution (PAID) which is one of the largest student-run organizations at Texas A&M University. Faculty and research staff also engage in funded applied research projects, lead industry consortiums to determine best practices and develop supply chain solutions, and engage in various outreach activities towards businesses. These include site visits, hosting guest speakers from industry in classes, continuing and professional education classes, and three active industrial advisory boards which oversee PAID, the undergraduate program, and the professional Masters of Industrial Distribution program. Each of these initiatives serves to more closely link the students and the program to the companies where the students will ultimately work upon completion of the program.

Figure 1 Relationship of various industrial distribution program activities to each other

The Professional Association for Industrial Distribution is an extremely effective and active link between students and industry and is one of the primary keys in the success of the program. There is a sufficient base of program graduates who are willing to advise and support the organization that they are able to make arrangements for companies to come to campus, to offer internship opportunities, to host business meetings and lunches, and to attend the biannual career fair for graduates to provide a base of opportunity for program graduates. PAID maintains these relationships as well as seeking out new companies and also in cultivating relationships with organizations who contact the program to recruit students. They schedule events with recruiting companies, and handle scheduling and the budget. While all of these activities are doubtless engaged in within many programs, there are probably few programs where the efforts are led and coordinated by the students. Organizations enjoy interfacing with the students, and the student officers generally are even more highly sought after than program graduates who have not been involved. The extent of the coordination of the PAID officers also frees up faculty and staff resources for other pursuits such as research, teaching, and securing research funding.

In part because of the close linkages between PAID and industry, and also the relationships which faculty have built within the industry, there are classes at both the graduate and undergraduate levels that allow students to work on industrial projects while they are still students. These active-learning experiences give the students an advantage in preparation over students who have not had these opportunities.

Through the Read Center for Industrial Distribution Research and Education and the Global Supply Chain Laboratory, cutting edge research best practices and solutions are developed and then passed back to managers and graduate students. Those practices which stand the rigorous test of applications can then be used in undergraduate courses to give the students the skill sets they need to be successful. Increased engagement between academics and industry of this type are likely to increase as the business climate becomes more competitive.

Conclusions

The Industrial Distribution Program at Texas A&M provides examples of some ways in which engaged scholarship can be implemented to improve the education offering of a program and enhance both the students who are taught, and the organizations that will ultimately hire them. Through the initiatives, graduates have been in high demand, even in a depressed job market and economic environment. While there are undoubtedly things which could be done better or differently, this provides a fine example of ways in which multiple stakeholders in the educational process can have their objectives addressed in a way which is mutually beneficial for many of the interrelated objectives. Specifically, the extent to which industrial problems and practices are incorporated into the curriculum and the ways in which industrial partners are included in decision regarding curriculum and research directions are of note.

Bibliography

1. Hughes, T., et al., *Scholarship that matters: Academic/Practitioner Engagement in Business and Management*. 2011, University of the West of England: Bristol.
2. Van De Ven, A.H. and P.E. Johnson, *KNOWLEDGE FOR THEORY AND PRACTICE*. *Academy of Management Review*, 2006. 31(4): p. 802-821.
3. Freeman, R., *Strategic Management: A Stakeholder Approach*. 1984: Cambridge University Press.
4. Donaldson, T. and L.E. Preston, *The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications*. *The Academy of Management Review*, 1995. 20(1): p. 65-91.
5. Bolton, D. and R.U.I. Nie, *Creating Value in Transnational Higher Education: The Role of Stakeholder Management*. *Academy of Management Learning & Education*, 2010. 9(4): p. 701-714.