

Serving the Community through Discipline-Specific Consulting

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Abstract

Discipline-specific consulting has a critical place in any university as a form of community outreach. For example, when government and nonprofit organizations need objective information for decision making, a university-driven consulting program providing free services can fulfill their needs. We show how this can be accomplished by describing a project completed by Statistics in the Community (STATCOM), a graduate student-run organization at Purdue University. STATCOM helped the city of West Lafayette, Indiana, develop and analyze the results of two community surveys. We use this as a case study to illustrate the multiple benefits of implementing such an engagement opportunity at any university and argue that discipline-specific consulting should play a major role in university outreach. This case study also illustrates how students can be utilized to fulfill a university's engagement mission.

Consulting as University Engagement

All communities have need for discipline-specific expertise. Local governments, nonprofit groups, and community service organizations must assess their performance, identify priorities, and decide where to spend limited resources. However, these institutions may not have the necessary skills to use information effectively in decision making and may lack the resources to obtain professional assistance in doing so. A university-based consulting program that provides free services to the community can meet these needs.

In this article, we describe this type of engagement through a specific model, the Statistics in the Community (STATCOM) program at Purdue University. STATCOM is a volunteer service organization run by Purdue University graduate students. Teams of student consultants work with governmental and nonprofit groups on issues that require statistical expertise. STATCOM projects typically involve the design of data-collecting instruments and the analysis of data to address specific needs of community clients such as learning centers, libraries, schools, and city governments. Student consultants perform all analyses, provide a detailed written report, and present

results to clients. These results are prepared for a general audience. All student service is voluntary, secondary to coursework in priority, and typically limited to about two hours per week.

The STATCOM program differs from other forms of university consulting and from traditional service-learning in that it is directed and run entirely by graduate students. All activities are conducted outside the classroom, and students do not receive monetary compensation or academic credit for their voluntary service to the community. Faculty advisors are available for consultation with STATCOM on request. However, clients are aware from the beginning of a project that they are working with consultants at the graduate student level with no direct academic or administrative oversight. Throughout the project, the client and students work as a team to address the client's needs.

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In the process, the student consultants gain a greater appreciation for the community need that is being addressed and become committed to finding a solution. This collaborative approach distinguishes the STATCOM model from many other forms of university-based consulting.

As a partnership develops between the client and student consultants, concerns of the client are addressed early in the process. This allows the client's needs to be met more efficiently and minimizes the potential for client dissatisfaction at the end of the project. The program likewise emphasizes monitoring quality throughout the process rather than inspection upon completion. Ultimately, STATCOM and its student members are responsible for the services delivered to the client. The client is meanwhile responsible for all decisions and actions taken based on the results of the project.

A STATCOM project conducted in West Lafayette, Indiana, in 2003 is presented as a case study to illustrate the diverse benefits of university-based consulting. University and community members involved in the project were interviewed to assess its outcomes and impact. These interviews were also used to identify potential beneficiaries, benefits, and learning opportunities that arise in this type of engagement. This case study demonstrates that university engagement in the form of consulting, especially through programs and organizations that facilitate the involvement of students, not only is feasible but provides a unique opportunity to fulfill both the engagement and teaching missions of a university.

Case Study: The Sagamore Parkway Task Force

In 2003, the mayor of West Lafayette, Indiana, appointed a task force of local business owners, property owners, and other stakeholders to develop a revitalization plan for the Sagamore Parkway, an economically important area of the city. The goal of the Sagamore Parkway Task Force (SPTF) was to formulate recommendations to develop the Sagamore Parkway in ways that benefit local residents and businesses while attracting new businesses. Five committees within the SPTF addressed key issues relating to transportation, pedestrian interests, retail services, use of public spaces, and financing.

The SPTF wanted to utilize local residents' and business owners' opinions on these key issues as it set priorities for the development of the Sagamore Parkway area. Following an initial meeting in July 2003 with the SPTF chairperson, STATCOM was asked to design separate surveys for residents and business owners, to advise on their implementation, and to analyze the survey results. After the initial meeting, STATCOM students regularly attended biweekly public meetings of the SPTF.

In August 2003, STATCOM helped the SPTF develop a survey instrument and a methodology for surveying West Lafayette residents. STATCOM also calculated the number of respondents needed to adequately represent residents' opinions. The city distributed the surveys in September and entered the responses into an electronic format in duplicate, as advised by STATCOM. The data were sent to STATCOM for analysis.

In October 2003, STATCOM helped the SPTF develop a similar instrument and methodology for surveying businesses along the Sagamore Parkway. In the same manner, surveys were distributed to businesses, responses recorded, and data returned to STATCOM.

STATCOM performed all data analyses and prepared written reports on each survey (*Du et al. 2003a; Du et al. 2003b*). The results were presented at public meetings in October and November 2003 for the resident and business surveys, respectively. The SPTF subsequently used these results to make recommendations to the city (*Sagamore Parkway Task Force 2003*).

The individuals involved in the SPTF project included five graduate students on the STATCOM team, faculty and staff members in the Department of Statistics at Purdue University who advised the student team, the incumbent mayor at the time of the project, the mayor who later took office in 2004, city employees who worked on the survey implementation, and members of the Sagamore

Parkway Task Force itself. Interviews with the faculty and staff members, the incumbent and subsequent mayor, one city employee involved in the surveying process, and the SPTF chairperson were conducted in 2006 to assess the outcomes of the project. These interviews also gauged opinions on the beneficiaries and benefits of the SPTF project, the learning that took place during the project, and respondents' satisfaction with the provided services.

Discussions with community partners involved in the SPTF project revealed that the two surveys designed and analyzed by the STATCOM team had a significant impact on the SPTF's recommendations to the city. These recommendations resulted in concrete actions taken by the city government to revitalize the Sagamore Parkway area, including improvements to sidewalks for easier pedestrian access; new street lighting, banners, and landscaping along the Parkway; establishment of a weekly farmers' market; and marketing for new restaurants. Longer term recommendations are still being implemented and will be used as guidelines for future improvements.

Benefits from the SPTF Project

The interviews conducted following the SPTF project supported a general framework for assessing the impact of university-driven community consulting projects. In such projects, individuals representing an educational institution (in this case, graduate students representing the STATCOM program, which is affiliated with the Statistics Department at Purdue University) provide a service to a community institution. By working with a client that in turn provides services to other community institutions or to the general public, a university-driven consulting project may benefit many others beyond the key actors in the project itself. The main beneficiaries are the individuals providing the service, the institutions they represent, the client, the recipients of services provided by the client, and the community at large. Interestingly, though the project's primary objective was community service, analysis of the SPTF project revealed significant reciprocal benefits for the students providing the service as well as the institutions those students represented.

The benefits to community partners were the most apparent. The Sagamore Parkway Task Force and city of West Lafayette received free consulting services while using appropriate methods to gather information. All interviewed community partners mentioned that by acting as a neutral third party, the STATCOM students provided statistical expertise that validated the results of the surveys

as well as the recommendations and actions that followed from those results. The students' role increased residents' and business owners' confidence that decisions were made based on impartial information that accurately reflected their views. In turn, residents' and business owners' opinions were considered in decision making, and improvements to the community were made based on their input.

The student consultants benefited in several ways through their involvement in the SPTF project. They learned how their discipline could benefit society as they interacted with community members and leaders to address a local need. This fostered community and civic responsibility that may continue later in their lives. The students worked together to apply their discipline-specific knowledge while becoming familiar with their local community. This teamwork built a network among the students that supported future collaboration on other projects. The students also gained personal satisfaction by volunteering their time to serve their community.

Universities are an integral part of their surrounding communities, and discipline-specific consulting programs are a natural way for universities and academic departments to engage in local issues. The SPTF project reflected positively on the university and built awareness of university programs and services that benefit the public. Purdue University's Statistics Department also gained from this involvement as the enhanced student interaction in

the SPTF and other projects cultivated a sense of community in the student body.

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The Department of Statistics has recognized the educational benefits of participation in STATCOM by encouraging all graduate students to get involved in the program. Academic counselors in the College of Science also encourage participation by senior undergraduate students in statistics and actuarial science. Leadership in STATCOM is recognized by an annual award presented by the Statistics Department. Grants awarded by Purdue University's Office of Engagement for the purchase of laptop computers and other materials also demonstrate institutional commitment to the program.

STATCOM at Purdue University currently has over fifty graduate student members with varying interests and degrees of expertise. Collaboration on STATCOM projects facilitates interactions and relationships among students who may otherwise interact rarely or not at all. This structure also rounds out the graduate students' education by providing important experiences not possible in a classroom. STATCOM itself has also benefited from engaging with community clients. For example, the SPTF project established a long-term relationship with the city of West Lafayette and increased recognition of the program within the community. The city subsequently asked STATCOM for assistance on three other projects and referred other organizations to the program. This word-of-mouth exposure has brought STATCOM several new clients.

More generally, discipline-specific community consulting benefits the academic discipline itself. Through students' active participation in public meetings and fora, members of the general public became aware of the societal relevance of statistics as a discipline. The students' engagement in the community highlighted the service-oriented aspect of the discipline and increased public recognition of the discipline's potential to make positive contributions to society. As the students applied their statistical expertise to meet a community need, they increased the public's understanding of key disciplinary concepts such as random sampling, margin of error, and bias. Early engagement of students in professional work also benefits the discipline by motivating further study and future careers in the field.

Opportunities for Learning

In addition to the benefits already discussed, analysis of this case study also revealed that the SPTF project provided numerous opportunities for learning among both the students and their community partners. The community clients learned how discipline-specific knowledge applies to their work and how sound methods should be applied when assessing information for effective decision making. Members of the general public understood the important contributions that experts in a discipline can make to the community and learned how key statistical concepts apply to society and their everyday lives.

The students gained significant statistical experience by applying classroom learning to meet a community need. They developed consulting skills as they talked to the client, understood the problem, phrased that problem in discipline-specific terms,

developed a solution, and communicated that solution to the client in general terms. In the process, the students were required to deal with practical considerations and limitations that arise in real-world problems. The students developed written and oral communication skills as they prepared reports and presentations for a general audience and made recommendations at public meetings. A range of prior experience and training among the STATCOM members also encouraged peer mentoring within the team.

The balance between educational benefits to the students and benefits to the community clients through the students' service demonstrates how discipline-specific consulting constitutes a form of service-learning (*Furco 1996*). In statistics education, service-learning has been implemented in undergraduate education (*Anderson and Sungur 1999; Root and Thorne 2001*). This case study presents a cocurricular approach to service-learning in graduate statistics education.

Conclusions

This case study illustrates how university-based consulting services that provide discipline-specific expertise can benefit community organizations and institutions. Such entities must be able to assess the services they provide, identify their priorities, and make informed decisions. However, a lack of resources or skills may hinder these groups in such decision making or prevent them from conducting needed assessments. Pro bono consulting services are a natural form of university engagement that can contribute to meeting these community needs.

The SPTF case study demonstrated that a consulting project can have a strong positive impact on a local community. Analysis of the case study suggested a framework for assessing the benefits of such projects and revealed that the project benefited the individuals involved as well as the institutions they represented. It also showed that in this type of activity there are numerous benefits and beneficiaries beyond the specific university members or community partners involved in a project. Identifying potential beneficiaries and the ways in which they stand to benefit from university programs or services is the first step in assessing the impact of these engagement efforts.

Interviews with key actors in the Sagamore Parkway Task Force project also indicated the value of gauging the impact of a service project on the client and community and on student learning. We believe that impact on the client and community can

be assessed through the use of a written survey provided to all clients following the conclusion of a project. However, discussion and reflection with the client after the conclusion of the SPTF project revealed further insights that might not have been identified through a written survey. The impact on student learning can be assessed further through surveys of students, either at the completion of a particular project or at the conclusion of service in the consulting program.

Service that requires expertise in a specific discipline enhances learning for both students and community partners. The SPTF case study demonstrated that graduate students in particular can play a key role in university engagement. A structured program or organization such as STATCOM can facilitate engagement by students as well as other members of the university that may not otherwise be engaged in their communities. For graduate students, the case study shows that service-learning does not require a classroom context and that a graduate student-run consulting program can provide an innovative model for service-learning. Its implementation in statistics can be generalized to other disciplines.

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There are many opportunities for students to use knowledge within their discipline to assist community projects. To achieve this type of engagement, it is important that students recognize what services their discipline can provide to their community. An organization following this model in any discipline should strive to provide simple, practical solutions to community clients. Such solutions would meet clients' needs while being accessible to a broad and largely nontechnical

audience. These solutions also facilitate learning among community partners that could be applied to solving similar problems in the future. While undergraduate students would benefit from involvement in discipline-specific consulting, we recommend that the program be directed by graduate rather than undergraduate students. This maintains quality of service to community clients while allowing student leadership of the program.

Student involvement is essential for the success of a voluntary student-directed consulting service. Such an organization should recognize that students must prioritize academic responsibilities

over volunteer service. To accommodate demands on their time, it is important that students work in teams in which responsibilities are delegated and shared among team members. Personal trust among members is essential for the successful and timely completion of tasks. The success of STATCOM is dependent on the willingness of students to interact and cooperate with each other and their ability to function effectively as a team.

University-driven pro bono consulting services reflect positively on the institution and its students while meeting needs within the community. Such consulting programs provide a unique opportunity for universities and their academic departments to fulfill their engagement missions. The further involvement of students provides numerous benefits to the students, their academic discipline, and their communities, while also contributing to the teaching mission of the university.

Note

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