Professional Development for ET Faculty: Using Consulting as Scholarship

Jerry W. Samples
University of Pittsburgh at Johnstown

Abstract

This paper discusses the relationship between consulting and professional development, and the need to maximize the effect of consulting as it relates to the classroom environment, student learning, and the professional development of faculty. Examples of successful and unsuccessful consulting/professional development situations will be presented.

Introduction

The Engineering Technology Faculty at the University of Pittsburgh at Johnstown received two simultaneous directives: first, each faculty member must have a professional development record to be eligible for promotion and/or receive tenure; and second, consulting is not to be considered as professional development[1]. Since Pennsylvania does not have a professional development requirement for registered professional engineers, consulting was the entrée to academic professional development. For many faculty, the removal of consulting as a professional development opportunity was a direct blow to their professional development program. To many, it was a concern, in that currency in the technical areas can only be achieved through either cutting edge research or consulting in technically advanced industries. Cutting edge research is not possible at undergraduate teaching schools where the teaching load limits the time available to complete complex research, and the lack graduate students places the research load on the faculty. The natural consequence of the problem was to determine what others were doing to foster professional development at other institutions.

Background

The question of professional development for Engineering Technology Faculty was addressed in some depth by Brizendine and Brizendine[3], and Samples, et al[4]. Both reported that the answer was plainly described by Boyer[5] in his book, *Scholarship Reconsidered: Priorities of the Professorate*. Specifically, faculty should analyze their current professional development interests and determine which of the four scholarship categories proposed by Dr. Boyer provided the best fit. This would allow individual faculty to mold their professional development agenda in such a manner that scholarship and practice would be unified. Lozano-Nieto[6] presented a similar but different set of definitions of scholarship directed specifically at engineering technology faculty. In each case, the papers fell short of answering the salient question, What about consulting?

The role of consulting in the life of a faculty member was addressed by Engelken[7], and Dandu and Delker[8]. In each treatment, the focus was away from professional development for scholarly reasons with a focus on maintaining technical currency and the financial implications of consulting. Professional development was limited to the development of skills that extended past the classroom and laboratory. The impact on the community and the reputation of the University within the community were highlighted. Rose[9] focused on the tie of consulting to the scholarly aspects of professional development including warnings for those beginning a career in academe. He ties the ideas of Boyer to engineering technology programs and sees the direct linkage between consulting and professional development. Rose concludes that, "To fully utilize consulting and industrial experiences toward promotion and tenure requirements, scholarly publications are necessary."

Finally, Yurtseven[10] and Aghayere, et al[11] address the question of professional development across the broad spectrum of requirements and opportunities. Yurtseven proposes a development plan that leads to tenure and promotion and is ET focused. Unfortunately, the professional development plan does not touch on consulting as a means to produce scholarly work. Aghayere et al, authors of the results of the ETC task Force on ET Scholarship, mention consulting activities but do not tie consulting with scholarly endeavors in a tidy fashion.

Consulting

To maximize the benefit of consulting two questions must be answered. How can we consult and satisfy the requirement to publish as part of our professional development responsibilities? What kind of consulting will help us stay current in our technical field as required by ABET[2] and also be useful in the classroom?

The answers to these questions are a function of carefully selecting the consulting activities and then properly using the results of that consulting. Consulting that is challenging and technically current provides an opportunity for faculty to stay abreast of their discipline which is essential in engineering technology programs. Unfortunately, much consulting is routine which neither satisfies the currency issues of ABET, nor does it provide for an up to date classroom experience for engineering technology students. The first step is to define the type of consulting that leads to faculty currency. The situations below provide insight into the consulting that is possible and its utility as a basis for professional development.

Situation1: A civil engineering faculty member spent an entire career as a professor teaching current construction and management skills and techniques. Constant currency in this changing field came from a private consulting business where one day per week was spent during the academic term, and four months during the summer, working with local builders, construction companies and the Department of Transportation. The faculty member was also an expert witness in many high profile cases. The result of this consulting was the application of current codes and standards to classroom instruction, where each young engineering technology student was taught the most current construction methodology. As one of the most sought after senior project advisors; many successful advisees are now working in prominent companies across the state and in neighboring states. In this case, the faculty member and the students were current.

Situation 2: A second civil engineering faculty member spent an entire career as a professor teaching surveying, photogrammetry and land management to include the current software to make maps. The currency in these fields came from a private consulting where one day per week was spent during the academic term, and four months during the summer working with local builders, construction companies and the Department of Transportation. Most of this faculty member's work was in the area of general surveying in support of builders and real estate developers. Although an excellent surveyor and great teacher, new techniques were seldom introduced in class. As time progressed, currency became an issue with some graduates. In general, graduates of these courses were well versed in the fundamentals and did well in industry.

Situation 3: An electrical engineering technology faculty member has been working for years as a consultant to a company where new electronic devices are developed, most being proprietary in nature. Consulting occurs one day per week during the academic term and for four months during the summer. This consulting is current and results in new knowledge being brought into the classroom for students in electronics courses and senior projects. As the most sought after senior project advisor, this faculty member's students are much sought after as they are ready for industry on graduation day.

Situation 4: A mechanical engineering technology faculty member has been conducting research in metallurgy on a consulting basis, with several local industries. Consulting occurs one day per week during the academic term and for four months during the summer. This work spawned relationships that led to senior projects with various industries. Over time, classroom presentations have been updated such that graduates are able to take to industry the most current metallurgical know how – including powered metallurgy and friction stir welding. The senior projects are generally reserved for the best students, as the industries involved expect results.

Situation 5: A mechanical engineering technology faculty member has been working several summers with various industries in the local area updating their CAD capabilities and presenting instruction to bring these industries up to standard. This work, keeping industrial CAD operations up to date, translates into a total understanding of the needs of industry, and therefore, the needs of the students.

These five situations illustrate at least three levels of consulting: cutting edge research, solid consulting that extends the knowledge of the faculty, and routine consulting. Of the three, the routine consulting of Situation 2 has very little impact on the faculty member's development within the discipline. This does not translate directly into stagnation, but it does leave the faculty member with a definite disadvantage when arguing that consulting is a professional development activity. Similarly, it short changes the students who expect absolutely current instruction immediately before seeking employment.

The consulting in Situations 1, 3, and 5 provide excellent professional development opportunities in the individual discipline and translate into excellence in the classroom. They are however, consulting experiences, not traditional professional development through funded research. Even the work in Situation 4 does not stand the test of consulting versus traditional professional

development activities. So, why consult at all? Why should faculty consult to satisfy ABET if it doesn't satisfy the professional development requirements for tenure and promotion?

The answer to the first question of "Why consult at all?" can be easily answered in view of our profession: that of being an engineer. Since we are responsible for teaching the future technologists and engineers, it is our duty to keep abreast of our disciplines and consulting allows us to do exactly that. Our ethic is to ensure the health and safety of the public, and the public rely on us to be technically competent at all times. Besides, many faculty consult to add to their income: so, the idea of keeping abreast of the discipline, and being paid to do so, is actually not a bad one.

Professional Development

The second question posed above concerns the university's definition of professional development and the relationship of professional development to consulting. This is a complex relationship and is, in fact, the basis of a career in academia in the Engineering Technology Division. If consulting does not satisfy the professional developments needs within the university, then there must be something related to consulting that is a viable substitute. The answer was plainly described by Boyer[3] in his book, *Scholarship Reconsidered*. Here, those not performing cutting edge research find other ways to satisfy the professional development requirements that the academy uses to promote faculty. Faculty who spend a great deal of time consulting should stay away from the scholarship of discovery and the scholarship of integration. Instead, they should concentrate on the scholarship of application and the scholarship of teaching.

To bring consulting back to the classroom, and into the professional development arena, faculty need to apply the scholarship of application and the scholarship of teaching. Application of newly acquired knowledge in the workplace should find its way into the classroom. The development of new problems and new lecture materials result from bringing the current technical world into the classroom environment. As stated by Boyer, "…theory and practice vitally interact[5]…" The winners here are the students and their prospective employers. The scholarship of teaching is the act of preparing this material for presentation through a variety of methods. Above all else, the faculty must know their subject. Boyer adds that: "Pedagogical procedure must be carefully planned, continuously examined and related directly to the subject taught.[5]" Combining the scholarship of application with the scholarship of teaching is the professional development that grows out of good consulting activities. Reporting on these activities at conferences and in journals closes the professional development loop. It is important to realize that the method of teaching the material, the pedagogy, is almost as important, perhaps more important than the material itself. Again Boyer states that: "While well-prepared lectures surely have a place, teaching, at its best, means not only transmitting knowledge, but transforming and extending it as well.[5]" Telling others, via conferences and publications, what works in transforming and extending the knowledge is an important aspect of developing the profession of teaching.

The consultants in Situations 1-5, write an annual report of activities that includes their teaching, scholarship or professional development and service. This report always includes their

consulting – but the policy precluded including consulting as professional development. Their cry of "foul" was followed by a need to make lucid the impact of consulting on the classroom, on their teaching and on student learning. From 1994 – 1996 there was great reluctance to us the Boyer model as a means of tying consulting to professional development. In 1997, after some encouragement, the model was accepted and the result was an increase in papers production, many about consulting and the application of knowledge gained from consulting in the teaching of students.

The successes and failures in this process depended on two things: the acceptance of the use of Boyer's model as necessary to professional survival, and the willingness to write. Within the faculty as a whole, there was recognition that the future would include Boyer, but some resented the need to write. Those with retirement in sight thought that the storm could be weathered without writing, and many did exactly that. The faculty with long term commitments began to write in earnest. The following summary describes the professional development results of the professors from the five situations, above.

Situation 1: The professor promised to write of the good things learned and brought into the class, but retired 6 years later with not one publication. This was a tremendous loss to the teaching community as this professor had an exceptional teaching model and many would have benefited from learning how to mix consulting and teaching using this model.

Situation 2: The professor retired immediately after the Boyer model was accepted and found no need to write a single word.

Situation 3: The professor has had a very productive writing career with several articles published that are both technical and pedagogical. This body of work led to another degree and continued high student ratings – and respect from the university at large. The respect issue is not a small one on a campus where most of the faculty have terminal degrees and the Engineering Technology Faculty are seen as not participating in the academy. Publications for this professor led to personal pride and renewed interest in both consulting and teaching.

Situation 4: The professor has had an easier path to satisfying professional development because most of the writing was accepted in classical journals and for international technical conferences.

Situation 5: The professor has been able to include some explanation of the professional development in the annual report, a solution that has been effective at a lower level. The inclusion of an explanation of how the consulting generated classroom problems and better explanations of the available CAD interfaces in manufacturing situations satisfied the spirit of the requirements of the university but did not satisfy the letter of the law on professional development. The necessary requirement to make this a successful part of a professional development program, the conference presentation or journal article, was not completed. It should be noted that the Boyer model was used; just not reported on.

What has not been told is the story of the Professor who uses management situations from industry as the tool for teaching engineering management and relating real industrial problems as part of the course. The entire course was changed by modeling it after the management

processes found at several of the companies where the professor consulted. In short, the pedagogy of the management course was totally altered. This change in the pedagogy of teaching management has been broadly accepted in the academy. The professor found a new life in writing about the pedagogy and influencing peers as they struggled to teach management courses. As a result of this reengagement, this professor has become the guiding light for new faculty as they begin their writing careers, by serving as a mentor to those looking for help. This transformation of a professor, who had given up on professional development when consulting was ruled out, reflects the life that the Boyer model has given to the teaching faculty in many colleges and universities.

Conclusions

Consulting is an excellent way to maintain technical currency as long as the consulting is technically challenging. Consulting that is mundane serves no purpose other than as a source of extra income and should not be offered as "development" of any kind. When technically challenging consulting cannot be utilized as a professional development substitute it may be necessary to find a method to prove that consulting has had an impact on the classroom environment and on student learning. The Boyer model provides the necessary outlet to prove that the knowledge consultants bring into the classroom can be represented as scholarship in the strictest sense. By publishing the results of the process, the community of scholars is more receptive to consulting as the basis for scholarly work.

Faculty in Engineering Technology programs should be encouraged to first learn the rules of tenure and promotion to determine where consulting may fit within the broad area of professional development. Next they should determine the type of consulting they want to pursue and how this work will impact on the courses they teach. Finally, to achieve some measure of scholarly "credit" for this work, they need to publish under the auspices of the scholarship of teaching or the scholarship of application.

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DR. JERRY SAMPLES holds a BS Ch.E. from Clarkson College, MS and Ph.D. in ME from Oklahoma State University. Dr. Samples served at the United States Military Academy twelve years before assuming the position of Director of the Engineering Technology Division at the University of Pittsburgh at Johnstown in 1996. He is currently serving as the Interim Vice President for Academic and Student Affairs at the University of Pittsburgh at Johnstown.