

Alliance for Industrial Internships: Growth and Sustainability

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Abstract - **The Biomedical Engineering Alliance for Industrial Internships (BME AII) is a network of member universities throughout the United States that cooperate for the benefit of biomedical engineering students. Coordinators at the universities work in tandem with the National Director and in regional networks to further facilitate placement of individual students, promote awareness of program resources, and enlarge educational ties with companies in the biomedical industry. The main mission of the Alliance is to increase the educational experiences in industry for biomedical engineering students across the country. The extreme growth of the BME undergraduate major has given further need for the resources provided by the Alliance.**

This paper discusses the evolution of this organization, examines the trend towards successful regional biomedical engineering meetings and explores the perspectives of its member institutions. Most recently, the Alliance mission has broadened to include aid in placing new or recent graduates in BME who have had internship or co-op experiences. This natural growth will provide a means to continue mutual rewarding interactions among students, faculty, alumni, and industry, as well as offer additional means to fund the Alliance. The progress towards and challenges of becoming a self-funding organization and the recent formal affiliation with The Biomedical Engineering Society is also presented.

***Keywords* - Internships, Industry**

Introduction

The mission of the Biomedical Engineering Alliance for Industrial Internships (BME AII, also referred to as the Alliance) is to provide educational experiences in industry for biomedical engineering students across the country. We aim to introduce companies to the unique skills and abilities of biomedical engineers, to provide companies with additional ways to recruit entry-level employees, and to facilitate the growth and success of our member's industrial interactions. The mission has broadened to include aid in placing new or recent graduates in BME who have had internship experience in selected industrial experiences. This natural growth will provide a means to continue mutual rewarding interactions among students, faculty, alumni, and industry.

The Alliance is a network of member universities throughout the United States that cooperate for the benefit of biomedical engineering students. Coordinators the universities work in tandem with the National Director and in regional networks to further facilitate placement of individual students, promote awareness of program resources, and enlarge educational ties with companies in the biomedical industry. Facilitating the placement of qualified, talented students and graduates helps ensure a vibrant and productive workforce and future for biomedical engineering. Students gain employment and valuable work experience, universities gain by having students be successful in their career field and companies gain by increasing the pool of qualified applicants to fill internship, cooperative education (co-op), and entry-level full time positions.

Evolution of the Alliance

In 2001, The Alliance began as a group of university professionals who were working to place biomedical engineering students in internship opportunities. University professionals could see that students often were not aware of learning opportunities within the industry, or had geographic or discipline specific needs that the local programs had difficulty filling, for example:

“My worries are finding students to go on co-op during the semester. I already have three positions, but no interested students. Any suggestions...” Jennifer Cubino, Former Coordinator Boston University.

Since learning opportunities are key to student success and job readiness, these linkages to industry are critical. Industry representatives often had a poor response from students for the internships or cooperative education opportunities they were making available, hence the need for a better connection between university and industry.

At that time, it was clear that pairs of Biomedical Engineering (BME) programs worked together on individual cases to the student’s benefit. Willingness to work with the larger concept of an alliance came readily because the Whitaker grant underwrote the initial costs of an Alliance. With funding from the Whitaker Foundation, the Alliance has been able to evolve from a few university professionals occasionally pairing up and sharing information by telephone/email in 2000, to a nationwide network of forty five (45) committed coordinators working in conjunction with the national director to solidify communication networks with the local and national corporations and industry professionals. Weekly email and telephone contact keeps the network alive and functional. Many continuing contacts (face to face meetings, conference presentations, workshops for students, faculty and staff) have been used to build value through network connections.

Much has been learned in recent years about optimizing the Alliance. Flexibility has always been a key issue and the Alliance has evolved to reflect the needs of its constituents. The most pressing questions needed to be answered first, how find all the opportunities, what the best method of distribution would be for each university, and finally what could be done to remove barriers for students interested in applying for the opportunities.

Well-timed closely focused efforts are a key to the function of the Alliance. Opportunities often come available in industry in a unpredictable fashion. At times there are many opportunities open in a very specific area, with one company in one city. Other companies advertise once or twice a year for an intern with a more general engineering background. Recruiters from industry are often less interested in promoting the internships and cooperative education opportunities, choosing to emphasize the regular, full time salaried positions.

University students are on a schedule for completing their degree and need to have a broad access to the opportunities nationwide. This is the dilemma for biomedical engineering students and universities across the nation. Each company, research facility, nonprofit organization or governmental enterprise has a different need for students at various levels of education and experience. Finding the right student for a particular position can be a great challenge.

As opportunities become available, Alliance coordinators “scramble” to get the word out to their students. This information is time sensitive and thus, the coordinators generate immediate email announcements to all students in a LISTSERV fashion or post information on their internal websites. Some coordinators may additionally follow up with students to encourage application. Again, timing is critical. The national director and each of the coordinators must be working to uncover and disseminate information in a timely fashion.

In each case, the presentation of a “first rate application” to the potential mentor or company office is crucial. These applications are the calling cards of the sponsoring programs. Mentors and companies often judge all of biomedical engineering by the case or two they know directly. Here, coordinators have always aided their students in preparing materials that “sells” the particular case. The Alliance adds significantly to this process by developing and sharing proven standards that are readily transferred among the members and used by their students. Experienced coordinators share their expertise in creating resumes specifically for biomedical engineering students, marketing materials targeted to industry, and best practices for internship programs.

New coordinators learn which background courses must be in place for successful placements and strong educational experiences; in part, they learn and share this information by discussion of what has worked for other campuses. These services are specific for the field of BME and are available only in a generic form from the typical “career-planning” office.

Great returns come from the stronger, better placements because each successful internship placement leads to company-wide and then industry-wide appreciation for the biomedical engineering discipline as a whole. This increases the likelihood that industry will be actively encouraging and supporting the university and the biomedical engineering discipline as a whole. The National Director and Alliance members assist new programs in this process by providing experience and materials for students and marketing.

The Alliance provides members a way for coordinators to connect and share unfilled local opportunities, while maintaining close connection with those mentors. For example:

“This past year several of my local companies used the database and were able to recruit interns via that method, when none of my students could fill the position. Each of those expressed their appreciation of the extended student pool.” Jean Alley, Former Vanderbilt Coordinator.

The Alliance began with a technology-heavy approach, assuming that the website and opportunity postings would be the most important resource. Over time, for some programs, it has become clear that contacts among coordinators and training are valued as much, and often more than the opportunities and technology. A quote from Jean Alley at Vanderbilt University illustrates this:

“For me as a brand-new internship Coordinator, the Alliance was a life-saver. I was coming into a job I had never done, and needed some basic direction. The members of the Alliance helped me in several ways. 1) They were sympathetic to my plight and made the whole process seem less forbidding, though not less challenging. The moral support from others who knew what I was facing was invaluable. 2) They were willing to help me figure out what resources I had and how to use those. They also shared tips and tricks for presenting the case for interns to the right people in the company. 3) They helped me think about what type of local companies were good targets and which national companies I wanted to tackle.”

Based on feedback from Alliance constituents, and several iterations of the website, we are currently moving to assist these connections using retooled technology. The input of our constituents has allowed us to shape the new website and database system to better serve the needs of our members, students and industry.

Alliance Time Line

- 2001 Whitaker Grant funds were used from the final year of an Industrial Internship award to create the Alliance.
- 16 initial member universities join the Alliance.
- 2002 Three year Whitaker renewal grant awarded.
- 2002 Alliance run student and program career workshops began at BMES annual meetings.
- 2003 Initiation of dues for members.
- 2003 Alliance participation in regional meetings began.
- 2004 Formal affiliation with BMES.
- 2004 Initiation of paid job postings.
- 2004 New website with database driven system administration for members and postings.
- 2005 42 University members and growing.
- 2005 Pursuing additional funding streams through organizing regional meetings.

Membership

Originally, the Alliance had three requirements for membership: programs must have an active local effort, they must agree to communicate with other Alliance coordinators and finally, they must be willing to post positions nationally if they are unable to fill them locally. This year a fourth requirement of membership dues was implemented.

University membership is steadily growing, with forty five (45) coordinators at forty one (41) schools across the nation. Sixteen (16) of the members are part of the original Alliance group. No members, after joining the network, have chosen to opt out of the Alliance. Of the original sixteen members, several have distinguished themselves in terms of service and dedication to the Alliance mission. Looking to the future, with dedicated, committed members who can work in a clear framework to uphold the purpose through their efforts beyond the typical “job description,” is expected to provide the solid, continuing foundation if the Alliance. Identifying coordinators for leadership positions within the Alliance will be key for the future. As the network expands and grows, members will need to step forward and take on additional responsibilities.

Structure and Organization

The Alliance is now a formal affiliation of multiple universities that is facilitated by a National Director. The change of title, to National Director from National Coordinator, better reflects the needed and true operational nature of this position. As the Alliance has evolved over the years, the organization has transformed into a non-profit affiliate of BMES. The National Director operates as a facilitator, polling and reflecting the needs of members; there is a role to share expertise, but no role for dictatorial setting of directives and methods. It has never been the intention of the Alliance to replace local efforts, but always to enhance them. The special role for the National Director is to continually work to inform industry about biomedical engineers during the process of recruiting internship, co-op and full-time listings, which are used by Alliance members. In addition to this effort, members also post unfilled positions through the Alliance network.

Members interact with each other on a regional and national basis, sharing information, opportunities and experience. The National Director facilitates and adds to member interaction. Each member has at least one designated individual (coordinator) who is the primary point of contact for the Alliance. Some universities have multiple coordinators. As mentioned in the membership section, the Alliance has forty-one (41) member universities and forty-five (45) coordinators.

A continued goal of the organization is to maintain flexibility and members work with the Alliance in different ways. The programs can best be categorized based their interactions with the Alliance. These are defined as: established programs, semi-established programs, newer programs, newer programs at well-established schools, and graduate only programs. The program needs vary by category, as described below.

Trends apparent in needs analysis of the different types of member institutions are the high need requirements for new programs as opposed to the relatively low need requirements for

established programs. Another related trend is the overall high need for training of new staff for these coordinator positions, most of the coordinators have turned over at least once in the past three years, while some have turned over multiple times. The Alliance is addressing this resource imbalance by charging a higher initial membership fee to reflect the relative time and effort involved for new schools and by offering a reduced fee option for those programs willing to serve in a leadership role.

Established programs are less likely to see the Alliance as an absolute necessity and would have difficulty justifying the additional membership expense. Leadership positions make an idea match for these coordinators, because they certainly have a lot to offer the Alliance, while they may not be drawing heavily on resources. Allowing these members to have reduced membership fee in exchange for service fills two needs, first the need for additional support for the part-time National Director and second, offering a solution for retaining experienced member universities who might not otherwise maintain their connection with the Alliance. It gives them exposure as leaders to industry and serves the Alliance as a whole by providing a base of experience to draw from.

Semi-established programs have a desire to build their local program and to gain from the additional postings generated by the Alliance as shown here in a communication received from a new coordinator at the University of Miami.

“Also, thank you in general for your wonderful postings! I have used them extensively to promote internship and career opportunities to our Biomedical engineering students. You provide a great service.” Ann Helmers, University of Miami.

Newer programs have a high need for best practice advice, education about how to connect with industry, resources for their program and students, and additional opportunities generated through the Alliance. Resources offered through the website and the ability to customize the new Alliance brochure for local programs are added benefits that these programs have a high interest in.

Newer programs at established schools reflect the latest trend in Alliance membership. These are usually long standing co-op or internship programs specific to engineering that suddenly find themselves trying to serve the needs of new undergraduate BME programs. They need specific direction on how to connect with the biomedical industry and how to market their students, while they are not as concerned about the opportunities generated through the Alliance.

Finally, **graduate only programs** often have only a faculty member who is coordinating local efforts. They have a high need for postings and specifically for national connections because of the specialized nature of each graduate student’s experience.

Each of these categories of programs with interest in internship-enriched education and collaboration with industry has a commonality. Collaborations in this area differ from competitions for funding or key partnerships. The Alliance as a body with its primary interest in the student’s success is a natural catalyst for many persons to talk and exchange ideas, opportunities, and methods. Alliance industry interactions are with human resource

professionals, engineering mentors, and hiring managers, Alliance-wide connections and postings are generated by the National Director and by local coordinators, bring benefits. As the affiliation with BMES grows, Alliance connections with BMES student chapters and interaction with the Interface with Industry committee will become increasingly important.

Future of Alliance Leadership

During the years in which the Alliance has been developing, the role of the local coordinator, who is almost never a faculty member, has been of obvious importance to success. Choosing a structure that brings these action-oriented individuals to key roles in the Alliance has been a goal. The change to a National Director opens the position of “seasoned coordinator,” thereby making it possible for universities with demonstrated success to give back to the Alliance in exchange for a reduced fee option. The concepts brought out below that involve inclusion as recognized leadership in the Alliance and return in terms of funding of program membership fees and listing-derived income are keys to grooming and maintaining leadership for the Alliance.

Many ideas that permitted the Alliance structural change this year came from discussions or written comments by our senior members. These items also reflected delivery of service in a cost-effective way to new members. Finally, especially important was contact with the Interface with Industry Committee of BMES. These individuals together provided the ideas that were harnessed. The coming year’s effort will focus on assembling a core of individuals who provide continuing leadership for the Alliance and linking them with the Board of Trustees of BMES and the committee through which BME AII reports on its affiliation.

Affiliation with BMES – a Collaborative Partnership

In an attempt to bridge entities with similar goals and missions, the Alliance Director campaigned and lobbied to form affiliation with other organizations for the greater good of students and alumni. There are many other engineering organizations that have a long history of advocating for students, employees and members of the engineering field. One such group, the Biomedical Engineering Society (BMES), was targeted as a logical choice for a collaborative partnership with the Alliance.

Impact on the society and its membership groups is summarized as follows:

- Enhanced services to students – increased rationale for student membership.
- Continued operation and growth of the Career and Program Workshop offerings for the Fall Annual Meeting.
- Access to a talented group of Alliance coordinators who have daily contact with the biomedical industry.
- Additional avenues to market to industry for society sponsorship, corporate membership, and industry participation at the Fall Annual Meeting.
- Service to small industry through job listing and database of students with internship experience.

- Develop an industrial perception of Biomedical Engineering as a well-defined discipline available at the national level (through regular contacts made by the National Director, who will act as an official representative of BMES).
- Continued contributions of the National Director and other coordinators to the BMES Bulletin.

BMES and the Alliance have been working together on an informal basis through out the past two years. After considerable effort, lobbying and dialog with the Biomedical Engineering Society, The Alliance became an official affiliate of BMES in February of 2004. The two organizations will now be working together in a formal manner, to serve students, BME programs and industry. The Alliance will operate as a free standing self-supporting entity, but this association with BMES will mean increased exposure for the Alliance with industry and universities, a method to collect funds, and a greater sense of stability for long-term continuation. New marketing materials have been created to reflect this affiliation.

Regional Meetings

Regional collaborations are also a part of the additional efforts of the Alliance. Chicago Universities Bioengineering Industry Consortium (CUBIC) has been a strong example for how programs can work together to promote the Biomedical Engineering discipline as a whole. CUBIC is a unique forum for the faculty and students of Chicago's leading bioengineering departments to meet with area biomedical and biotech companies to discuss scientific, business, and career opportunities in the region. For the past several years, the National Director was able to add to the conference by putting on a student career workshop. This event has gained exposure with industry and several of our regional groups, including New York and Ohio have expressed interest in modeling this meeting.

The Alliance has given guidance and offered to assist with several other regional meetings. These regional interactions offer another opportunity to strengthen Alliance/BMES ties by collaborating with local chapters. This year the Alliance intends to establish new meetings modeled on the CUBIC example as a way to strengthen membership ties, connect with industry and create an additional revenue stream to fund the Alliance.

Challenges

During the past year, the Alliance has critically examined and addressed a number of challenges that act as barriers to progress:

- Tracking student placement has continued to be an issue. This is being addressed by the implementation of the new website that will allow the Alliance to track more closely, measures such as the number of students applying, number of offers, number of website hits, number of successful placements, number of students reached through workshop presentations/conferences, number of companies listing jobs, and number of total jobs posted.
- Universities have different needs from the Alliance which at times can create difficulty in understanding the value of paying for membership. This is being addressed by examining

needs and characteristics of the members and creating marketing materials that address these specific types of interactions.

- Providing an individual operating at a high level of daily/weekly communication with members without adding staff is a standing challenge. The means to work together by the new web site, to keep that technology modern by relatively small updates provided by a professional programmer, and the direct entry of additions by selected individuals (National Director and selected, seasoned coordinators) are steps to overcome this barrier. Consistency is required and provided by saving of templates and training of a small cadre of individuals. The new member leaders will be able to address this challenge by providing additional assistance for the part-time National Director.
- Coordinator turnover, or “new coordinators” and need to bring them up to speed with the rest of the group are continual – they both a reason for the Alliance to exist and a problem in its operation because new training is always needed. Providing a means for experienced coordinators to aid in the training and the building of networks of programs at various levels of existence are means to meet this challenge. The barrier aspects are being solved through the creation of orientation materials and by mentorship with experienced coordinators. The new leadership positions will be involved in addressing this barrier.
- The question of sustainability beyond grant funding has been a barrier in the past. This part has been addressed by the collection of membership dues and fees for posting and by lobbying to create a formal relationship with BMES. The new means to raise a large fraction of the funds needed for Alliance operation by listings of initial positions has obviated this situation. The challenge is to realize significant dollars by operation of the web-based system of listings that is open to members. Success is judged likely because placement of graduates who have completed internship experiences is a shared goal. Linking efforts by seasoned coordinators to reduced levels of membership fee is a means to build our cadre of leadership, to magnify the National Director’s effort, and to build a pool of individuals capable of stepping into the role of National Director.

Long-term Sustainability

The Alliance has made strong steps towards becoming a self-sustaining entity. The final year of Whitaker funding will be used to increase the momentum and set methods in place that will allow the Alliance to continue indefinitely. Key elements of continued success are listed below:

- Establish a senior leadership core from seasoned coordinators to maintain the momentum and be in a role to grow the level of coordinated effort. Such individuals would bring recognition to their programs and provide links within the sub-networks that are a key to larger impact by regional and mode-oriented efforts.
- Obtain funds from listings of initial or second positions (currently the posting fee is \$150/per 30 day posting).
- Work with members to provide regional meetings and joint activities that aid the students and raise awareness of opportunities in regional industries, e.g., through events like the Cubic Program in Chicago. Such meetings should also generate additional revenue for the Alliance.

- Deliver elements of our basic mission by providing new and more internship/co-op/job opportunities to our individual Alliance members and thereby promote the return on the annual membership fee.
- Demonstrate our progress and success with two reports to the Board of Trustees of BMES and work with its Committee for Industry to cement the affiliation of AII and BMES.

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