

A Collaborative University-Industry Agreement to Establish
an Advanced Communication Laboratory

Ali Eydgahi , Mohammad Fotouhi, Ronald Baddock, Catherine S. Bolek
University of Maryland Eastern Shore/ University of Maryland Eastern Shore/
Amtek Company/University of Maryland Eastern Shore

Abstract

This paper describes the details of a partnership and collaboration that have recently been created between University of Maryland Eastern Shore, Lab-Volt systems, and Amtek Company. This partnership has been envisioned to meet several goals and objectives for each partner. The individual goals when combined, benefit the university and each industry partner. Each partner in the relationship adds a unique element. The university adds the teaching facility and the instruction, Lab-Volt Systems provides the modern lab equipment, and Amtek Company provides the lab consulting and designs services. The main goal of this partnership is to establish an undergraduate advanced communication laboratory for teaching and undergraduate research purposes at the University of Maryland Eastern Shore and to use the laboratory as the designate Lab-Volt telecommunications training facility for the United States and internationally. Another goal for the university is to attract new students to its engineering and engineering technology programs from local Microwave and Communication industries by adding a modern state of the art advanced communication training laboratory equipped to prepare students as we enter the new millenium. The addition of advance communications lab equipment goes a long way towards meeting this objective. Through this partnership, the university provides an opportunity for instructors at other institutions to come to university of Maryland Eastern Shore to learn how a modern telecommunications lab may be utilized to teach students. These instructors will be invited to the university to participate in seminars and workshops that utilize the advanced communications lab. The visiting instructors will have an opportunity to observe and to utilize the lab equipment and will be instructed in their set up for performing a number of undergraduate lab experiments.

I. Introduction

The role of new technology in the workplace has greatly affected the daily operation of most institutions¹. Networking, telecommunication, automation, data processing, and

computer applications have provided higher efficiency, reliability and lower cost. These advances have also had a great deal of impact on undergraduate education and research².

Froyd³ states that academic departments have made enormous contribution to the education of undergraduate students and to increases in the knowledge base through research. However, these same departments find it hard to make the necessary changes to keep current with today's technological advances. One solution, that has received attention during the 1990's, is the university-industry partnership. Liaw⁴ believes that strong industry ties add breadth, depth, and continuity to the undergraduate education.

Along with the benefits, these partnerships can create ethical concerns. Such concerns include the rights of both parties, approaches that are fair to all, and the need to avoid conflict of interest⁵. To address these concerns, guidelines that direct the actions of partners have been promulgated by such bodies as the U.S. Office of Science and Technology⁶.

In this paper, we present a partnership and collaboration that has recently been created between University of Maryland Eastern Shore (UMES), Lab-Volt systems, and Amtek Company.

II. The Partnership Program

The objectives of this partnership are to establish an undergraduate advanced communication laboratory for teaching and research purposes at UMES and to create a designated Lab-Volt telecommunications training facility. The training facility will be open to the public including international students and others seeking advanced training in the area of telecommunications.

The University of Maryland Eastern Shore has been part of the higher education community since 1886. It is the 1890 Land Grant Institution for the State of Maryland located on the Delmarva Peninsula. The University serves approximately 3,000 students with over 35 undergraduate, graduate, and Ph.D. programs. The creation of a new four-year electrical engineering program served as the impetus for the collaborative partnership.

The Lab-Volt Systems is recognized as one of the leading designer and manufacturer of educational and training systems that meet the high standards required by the technology and engineering educators. Lab-Volt produces equipment and curriculum for teaching laboratories in many different areas of engineering and engineering technology.

The Amtek Company is a representative and provider of high-technology training and educational equipment from a number of manufactures and provides sales and consulting services. Amtek Company is the liaison between Lab-Volt and the university.

To structure this agreement, a faculty from UMES' Department of Engineering and the Department of Technology worked closely with president of Amtek Company and two

representatives from Lab-Volt systems. Meetings were held with university officials and representatives from Lab-Volt and Amtek to discuss the design of the laboratory and the nature and scope of experiments that would result in improvements in undergraduate education of engineering and technology majors. During these meetings, it was determined that the partnership could expand its original purpose to include a telecommunications training program for non-students seeking to enhance their technical skills. With the support of the University's Continuing Education Program, the University and corporate representatives discussed plans to offer continuing education credit and certificate programs. A carefully designed layout was agreed upon, a set of experiments was discussed, and a list of required equipment was developed.

The new equipment will support the study of analog communications, digital communications, fiber optics, antennas, microwave, and analog and digital telephony. The equipment and curriculum progresses into advanced detail for each of these subject areas. The equipment design is current, unique, and capable of supporting curriculum reform and enriching laboratory exercises. Because of these features, UMES believes that Lab-Volt/Amtek solution provides for telecommunications training capable of supporting the necessary depth and breadth of coverage.

In the first year of the agreement, Lab-Volt Systems will provide a two-day training workshop. Seminar invitations will be generated from a Lab-Volt university telecommunications customer database, by announcement at the ASEE annual conference, and through web list-server of ASEE Technology Division. Additional invitations will be added based on UMES recommendations. Distribution of the invitations will be provided by Amtek Company. Participants will be responsible for their transportation and lodging. The workshop provides hands-on experimentation on topics related to analog and digital communications, analog and digital telephony, fiber optics, antennas, and microwave. In the second year of the partnership, Lab-Volt will provide an additional seminar. The purpose of this seminar is to enhance the knowledge of the previous participants for curriculum development and new experiment designs.

Lab-Volt Systems and Amtek Company are also providing a "Partnership Equipment Grant". The grant provides complementary communication equipment and modules at no cost in the first year of the partnership. To ensure the best use of the laboratory and equipment, UMES has agreed to allow Lab-Volt Systems and Amtek Company access to the advanced communication lab on an as needed basis for the purpose of demonstration and training of their customers.

The partnership between the University, Lab-Volt Systems and Amtek Company has been envisioned to meet several goals for each partner. The university goals include:

- Enriching the engineering and technology curriculums,
- Providing access to high-end technical equipment for undergraduate research,
- Providing training facilities for the local microwave and communication industries,
- Recruiting and retaining more prepared students.

- Providing research and test facilities for small local industries to develop new products,
- Providing faculty development in telecommunication through training and hands-on workshops for other institutions.

The Lab-Volt/Amtek aims are:

- Provide their potential users an opportunity to have hands-on experience in a lab that is already working and equipment that are ready to be tested,
- Provide training facilities for their customers to perform actual experiments in an academic environment,
- Provide workshops for faculty and students in other institutions with their advance communication equipment that may likely make them to become their future customers for the same lab equipment.

The individual goals when combined, benefit the university and each industry partner. Each partner in the relationship adds a unique element. For example, the university adds the classroom teaching and laboratory instruction. Lab-Volt Systems provides the modern lab equipment. Amtek Company provides the lab consulting and designs services.

III. Conclusion

A partnership must be beneficial to all parties if it is to be successful. This education/industry partnership works because all parties gain something from the relationship. The collaborations between university and industrial partners ensure that students will have access to the latest technology, real world experience and faculty involved in research projects seeking solutions to telecommunications and information technology problems. Through such partnerships, the University is kept up-to-date on new and emerging laboratory teaching equipment and technologies available for study.

Bibliographies

1. Sbenaty, S.M., Industrial Partnership for the Enhancement of Engineering Technology Education, Proceedings of ASEE Conference, Charlotte, NC, 1999.
2. Fournier, D.J. and Gaudet, C., Creating Relationships with Industry to Advance New Programs, Proceedings of ASEE Conference, Charlotte, NC, 1999.
3. Froyd, J.E., Building Effective Industrial Relationships: The Foundation Coalition Experience, Purdue University, 1995.
4. Liaw, B., The ECSEL's Integrated Approach to Industry-Academe Relations, Purdue University, 1995.
5. Semas, J.H., University-Industry Research Partnerships: A Balanced Look at the Ethical Issues, High Technology Careers Magazine, 1999.
6. Cho, M.K., University-Industry Research Must Get Scrutiny, The Chronicle of Higher Education, Section Opinion, Page B4, August 1, 1997.

ALI EYDGAHI

Dr. Eydgahi is an Associate Professor of electrical engineering at University of Maryland Eastern Shore. He received his Ph.D. and M.S. in Electrical and Computer Engineering from Wayne State University. Since 1986 and prior to joining University of Maryland Eastern Shore he has been with the State University of New York, University of Tehran, Wayne County Community College, and Oakland University. Dr. Eydgahi is recipient of the Dow Outstanding Young Faculty Award from American Society for Engineering Education in 1990, and the Silver Medal for outstanding contribution from International Conference on Automation in 1995. He is the ASEE Campus Representative at UMES and has served as a regional and chapter chairman of IEEE and SME in New York. He also has served as a session chair and a member of scientific and international committees for many international conferences. He has published more than seventy papers in refereed international and national journals and conference proceedings.

MOHAMMAD FOTOUHI

Dr. Fotouhi is a Professor of electrical engineering technology at University of Maryland Eastern Shore. He received his Ph.D. in power System Engineering from University of Missouri-Rolla, M.S. from Oklahoma State University and B.S. from Tehran Polytechnic College. He has been conducting a practical research on the growth and characterization of the dilute magnetic semiconductor since 1985. He is a member of Eta Kappa Nu Honor Society. He was chairman of Student and Industry Relation and Host Committee member of IEEE Conference on Power Systems Computer Application in 1991. He also was chairman of Student Relation and Host Committee member of the IEEE Power Society Winter Meeting in 1996.

RONALD BADDOCK

Mr. Baddock received his B.S. degree in Business Administration from Towson State University in 1980. In 1982, he began his career in sales at Amtek Company. Over the past 18 years he has spent much of his time training on and learning about products used for training students for technical careers. In 1996, he became president of Amtek Company.

CATHERINE S. BOLEK

Mrs. Bolek received a B.A. in Psychology and a M.S. in Health Science from the University of North Florida. She is the former National Institutes on Drug Abuse, National Institutes of Health, Associate Director of Special Populations Research and current Director of Sponsored Programs for the University of Maryland Eastern Shore. Mrs. Bolek has received over \$3.4 in funding from the Environmental Protection Agency and the Department of Defense for Information Technology projects. She is the author of articles, chapters, and co-author of books on research methods and project design.