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Research Brief

INDUSTRY-ACADEME RESEARCH LINKAGE

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INTRODUCTION

The basis of this paper is the experience gained in establishing and sustaining linkage programs between academe and industry in some cases several government R & D institutions. The UP Manufacturing Linkage Program (UP-MLP) involves fifteen companies, two government R & D institutes and the UP College of Engineering. It was established as an offshoot of the recommendations of "Engineering Conference '85" organized by the UP College of Engineering and held in December 1985. In this Conference, the College had requested three industry representatives, F.T. Berba, Jr., B.K. Hernando, and R.C. Lirag Jr. to present a paper on linkages. The original program was initially supported by the Philippine Council on Industry and Energy Research and Development (PCIERD) of the DOST. In line with a direction to make linkage a national activity, programs were later established in other regions of the country. In the Visayas, the Industry Academe Linkage Program (IALP) established in February 1990, involves eleven Cebu-based companies and the University of San Carlos College of Engineering. A similar program has recently been launched at Xavier University in Cagayan de Oro City in Mindanao. To date two other Metro Manila-based schools have started programs. All of these programs were initially supported by PCIERD. In a parallel development, De La Salle University has an on-going, formalized, linkage program with several companies.

During the planning phase of the Engineering and Science Education Project (ESEP) of DOST, the World Bank recognized that industry- academe linkages are a vital component in the improvement of engineering education and in enticing component graduate engineers to work on the shop floor. Subsequently, the Science and Technology Coordinating Council (STCC) passed a resolution "Creating a Committee on Manufacturing Linkage Program" to start a nation-wide effort on linkages. Recently, the Technical Panel for Engineering and Architecture Education (TPEAE) of DECS has urged the different schools and universities to set up linkage programs.

It has also been demonstrated that both the academe and the industry gain from linkages. The industry obtains better trained and oriented engineers, aside from benefiting form student projects and faculty involvement. Academe obtains feedback from industry on curricular development and allows students as well as faculty to be directly involved in industry. It also obtains relevant lecture-plant visits for students practically at no cost. In some cases, students undergo on-the-job training, usually during the summer break.

In this paper, by drawing from past experiences, approaches to the establishment and sustenance of linkages will be discussed. The concept of linkage shall also be further extended to higher levels of cooperation which include problem solving and research.

APPROACHES ON THE ESTABLISHMENT OF LINKAGES

Academe should take the initiative

In the establishment of linkages, it is advised that academe -- in this case individual schools or universities should take the initiative by framing a proposal addressed to companies. This statement is premised on the fact that many companies are willing to donate non cash items such as: the time and expertise of its staff, in-plant facilities and in some cases even donation of its old equipment. Companies will readily give when they see a corresponding value or benefit for themselves.

A professional working relationship must be established

A key feature in getting the interest of industry in a linkage is to ensure that the school or university involved is "marketable". The linkage proposal must be properly and professionally framed and packaged, outlining the benefits and expectations of both parties. In this way, aside from awakening the interest of potential partners from industry, academe will also be able to project its image as a worthwhile partner, capable of delivering on its own premises and showing its own skills and talents. On this basis, a linkage can start as a professional undertaking with proper commitments on both sides.

A linkage prospers due to personal commitments of the representatives.

Once a linkage has been started, one of the factors that makes it prosper can be traced to the company representatives. The representatives must be committed to the program, because they have to keep on selling it to their company. That is why there must be continuity of representation--if possible the same company representative must consistently attend all the meetings. Eventually the representatives themselves will develop a personal commitment to the linkage and they will continue to contribute to its goal. The representative will also strive to obtain and sustain top management support for the program.

The UP-MLP has been meeting regularly since its establishment in December 1985. Most of the company representatives have remained the same.

Early successes are important in the growth of a linkage.

When a linkage is finally established it is important to remember that initial successes are vital to its survival. The first activities it must undertake must be mutually beneficial to the parties involved, as well as being easily achievable. Difficult and ambitious projects must be postponed until both parties have developed confidence in each others abilities and until a

working relationship is established. At the outset even a "soft entry" type project must be considered. Suggested activities are given in an earlier manual written by the UP-MLP committee ("Connections", 1989).

As the number of successful activities increases, the linkage becomes stronger, and bigger projects can be planned and undertaken.

An established Linkage program can serve as a platform for higher level cooperation between academe and industry.

Once a linkage program has been "institutionalized", it can serve as a platform for other (higher) forms of cooperation. After some time both parties will have:

a) familiarity with each other's strengths and weaknesses;

b) an appreciation for the areas of common concern; and

c) developed a network of contracts in the participating companies.

Based on past experience other forms of cooperation have evolved. Some of these forms will be briefly discussed.

The Manufacturing Industry Roundtable (MIR)

After five years of cooperation, members of the UP-MLP looked for other forms of cooperation beyond the training of students. Different concepts were reviewed but the most appealing was the Boston University Roundtable in the U.S. Eventually, it was agreed that a group be formed along similar lines with the objective of solving problems leading to world class competitiveness in manufacturing. The Manufacturing Industry Roundtable was formed from UP-MLP members and other interested companies. In the MIR, emphasis is placed on discussing and solving issues and problems in manufacturing. While the UP College of Engineering is a member, the MIR also encourages cooperation between companies. The UP College of Business Administration is also an MIR participant. Recent activities of the MIR have been seminars and discussions on ISO 9000 activities served to inform member companies and to show them a possible direction for quality systems improvement. The work on Bench marking has been directed at its use as a tool to improve productivity, efficiency and competitiveness of participating companies. Some of the member companies are actively bench marking with the other companies of the MIR.

Contract Research with Government R & D Institutes

An offshoot of the participation of government R & D institutes (RID's) in the UP-MLP has been the establishment of working relationships between the RID's and

individual participating companies. Eventually some of the companies, having become familiar with the DOST RID's enter into agreements to have the RID's carry out contract research projects. This allows the companies to carry out research at minimal investment in equipment and manpower by paying for the efforts of RID's for specific projects. This type of activity is actually a service offered by DOST RID's to all companies, whether they belong to a linkage program or not.

Joint R & D Projects

Due to the networks established by the UP-MLP some joint R & D projects have been started while others are in the planning stage. In a recent project on "Thermal Management in Thin IC's, a local company working with the UP College of Engineering and the DOST-ASTI was able to obtain DOST funding for an applied research project.

At present other projects are in the planning stage such as the one involving recovery of metal values from reject IC's. This project will involve a local IC packaging company, a local private laboratory, UP faculty and hopefully DOST assistance.

For this type of activity, there must be good communication between the university and the company concerned. The project must also fall within the DOST priority areas to be considered for funding support. Such communication can be developed through linkage programs.

Other projects are being solicited form the various DOST networks. The DOST-ESEP network members should be able to participate in this exercise.

R & D Networks (The PCIERD Experience)

Another means of creating research linkages is by setting up R & D networks. The Philippine Council for Industry and Energy Research and Development (PCIERD) of the DOST, aside from supporting linkage programs, has assisted the establishment of specialized networks on the national and regional level. The Coco R & D Network the Sucro Network R & D, the Consortium of Agencies in Industry and Energy R & D (CAIERD) in Cebu, the Plastics Research and Development Center (PRDC) and to a certain extent the Energy Development and Utilization Foundation Incorporated (EDFI) were all established for the purpose of promoting joint R & D projects. These bodies already serve as linkage or network mechanisms for research. Schools and universities are members of these networks. The other DOST Councils have established similar networks. Interested schools with a certain level of expertise should get in touch with these networks through the appropriate DOST Council.

CONCLUSION

In order to have higher level linkages which can lead to R & D cooperation, the following must be present:

a) a shared vision on the direction and activities of the linkages,

b) mutual benefits obtained from the linkages,

c) a mutual appreciation of the needs of each party, particularly in research.

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