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# Paper Session II-D - Defining Partnership Needs for Florida's Aviation/ Aerospace Industry and the State Educational System

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# Defining Partnership Needs for Florida's Aviation/Aerospace Industry and the State Educational System

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## Abstract

The contribution of this paper is a description of a process to determine partnership needs between Florida's aviation/aerospace industry and university and community college educational system. This process was developed to produce an educational success plan which address two questions: How can the state's education system bring the most value to the aviation/aerospace industry? and How can the aviation/aerospace industry bring the most value to the state's education system? To answer these questions we first define the cyclic nature of the benefits from an industry-education partnership. Second, we define three partnership components: education, research, and technical assistance. Third, a research process to identify partnership needs is described. The process includes face-to-face interviews; a detailed, quantitative, industry survey; and a qualitative survey of researchers. Fourth, lessons learned from developing and applying this research process are given.

## Introduction

Industrial organizations, universities, and community colleges are faced with a similar problem of continuously meeting customers' needs and improving their products/services and capabilities. Partnerships between industry and the educational system are a vital mechanism to ensure the success of both the industrial base and the educational system. When the partnership is effective, it helps build a stronger Florida. The aviation/aerospace industry is a major part of Florida's industrial base. As of 1995, Florida has 219 firms engaged in the aviation/aerospace industry. Florida's share is third largest in the United States at 6.4% of the nation's business in this sector, behind California (751 firms, 21.9%) and Texas (262 firms; 7.6%). A recent study was completed by Enterprise Florida (The Kitchen's Group, 1997) for the Aviation/Aerospace Alliance Task Force of Enterprise Florida to better understand the industry's needs for conducting business in Florida. Seventy percent (70%) of the respondents defined the availability of a skilled workforce as a key concern. Based on the initial survey results, the need for a follow-on and more in-depth study was identified to address industry's educational needs.

Through an agreement with the Kennedy Space Center and Enterprise Florida, we are working to further understand the partnership needs between Florida's aviation/aerospace industry and educational system. As part of the NASA mission, the Kennedy Space Center signed an agreement with the Florida Board of Regents (NASA, 1997). This project supports NASA's mission to bolster the commercial aerospace industry, disseminate knowledge, and enhance the skills of faculty by gaining an understanding of how industry and the state education system can support each other in developing both the workforce and knowledge needed to meet the future needs and challenges of Florida's aviation/aerospace industry. This study will help us assess how the State University System supports the aerospace industry in the state of Florida and how Florida's industry in turn supports the State University System. The results of this research will be used to develop an

"Education Success Plan". Furthermore, this knowledge should be helpful to improve the nation's aerospace/aviation industry by providing insight into the global issue of partnerships.

## Partnerships Add Value

As shown in Figure 1, partnerships add value by enhancing faculty, producing knowledgeable students, and developing a strong industry. Faculty's capabilities are enhanced from being engaged with an industrial partner through research grants or technical assistance efforts. These engagements provide real-world intellectual stimulation which drives the production of new knowledge about a research area and the industrial world. The new knowledge can be applied to new partnerships as well as to enhance the educational curriculum which leads to better students (Zimmerman, 1987). A student's capabilities are directly enhanced by being involved in partnerships (Musick, 1994). Knowledge about career paths and research skills are increased. Also, funding opportunities such as fellowships, research assistantships, and other education programs (e.g., co-operative education or internships) are provided to students. Industry gains from both faculty and student involvement. The knowledge produced by faculty research helps solve a problem and can lead to technology transfer to the industrial partner. Both future and current employee needs are met through degree programs and training offerings. A strong industry will further drive the cycle by increasing opportunities for further faculty and student involvement and development (Berenbeim, 1993). Partnerships between industry and education further the development and success of each partner.

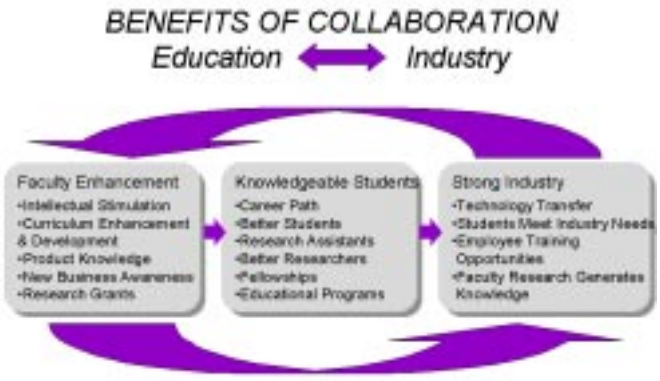


**Figure 1. Cyclic Nature of Industry-Educational System Partnerships**

## The Components of the Partnership

To better understand the nature of industry-educational system partnerships we have defined three components of the partnership. These components focus on the tangible outputs and services that industrial and educational partners can exchange. Given in Figure 2 are three components that are shared by the partnership: education/training, research, and technical assistance. Education/training is the sharing of knowledge to students via degree programs and to employees through short courses and certificate programs (Lewis, 1990). Training is the transfer of specific knowledge or know-how about techniques to improve organizational and job performance. The goal of education/training is to help organizational members develop self sufficiency. Research is the development of new knowledge which further supports the education/training and technical assistance activities. Technical assistance is the application of specific knowledge to support a problem solving activity. Technical assistance is also viewed as reducing scientific knowledge to practice or the transfer of technology.

The educational system supports these components through its mission (White, 1973). University faculty conducts research which produces the knowledge for use in education/training, for use by organizations to develop products and services, and for solving problems through technical assistance. An industrial partner supports these components by providing real-world problems for research and technical assistance (Levy, 1987). Research is also supported by the industrial partner providing laboratory equipment and research funding to conduct the research activities. Industrial partners support the educational mission by providing such things as 1) fellowships or scholarships for students; 2) research and technical assistance projects for faculty which enhances their skills; and 3) real-world cases, guest lectures, adjunct professors, or tours to use to enhance the classroom experience. This shows how technology transfer in both directions benefits both parties (Davies, 1984). The identification of requirements for Florida's aviation/aerospace industry and educational system for these three components need to be defined.


**Figure 2. Components of a Partnership**

## Research Process to Understand Partnership Needs

Given in Figure 3 is the research process used for determining the partnership needs for Florida's aviation/aerospace industry and education system. The final output that the study will support is an "Educational Success Action Plan." This plan will be developed with Aviation/Aerospace Alliance Task Force of Enterprise Florida. This plan will use the set of strategic issues identified from a working session. Participants from each of the state's universities, a representative from the community college system, and various educational groups which support the aviation/aerospace industry will be invited to this working session. The goal of the session is to develop a set of recommendations or strategic issues that need to be addressed for a successful partnership. As input to this meeting we will conduct three data collection efforts.

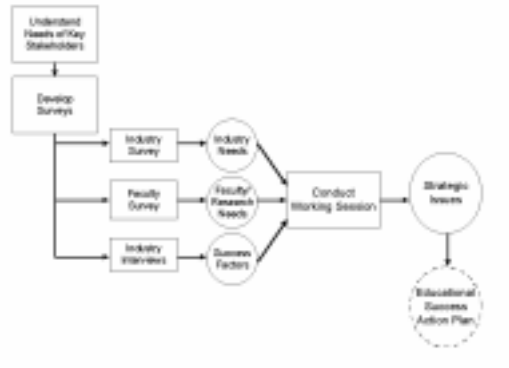

**Figure 3. Research Process for Determining Partnership Needs**

The three data collection efforts provide a synergistic look at the partnership issues from both the industry and educational system perspective. The first study is a detailed, quantitative, survey of the partnership needs from industry's perspective. Over 200 of Florida's aviation/aerospace organizations will be surveyed. As shown in Figure 4, the survey will focus on assessing the partnership relationship on 1) three components of education, research and technical assistance needs industry has from the educational system; 2) general support items that industry views as success factors or barriers to a partnership, and 3) specific strategies for a successful partnership. The education/training relationship assessment is based on industry's need for the type of hires and skills required by the organization. These needs are driven by the practices of industry. Each of the items in the shaded boxes will be addressed by the survey.

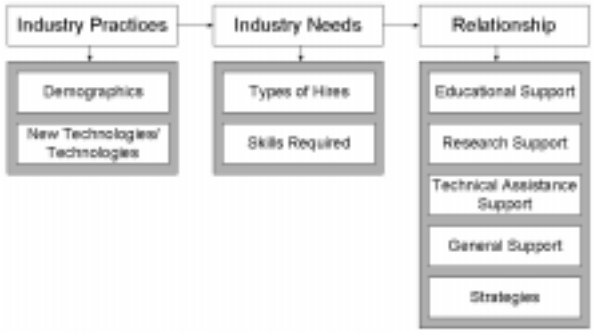


**Figure 4. Model For Understanding Industry's Perspective on Partnership Issues.**

The second data collection effort focuses on understanding the educational system's perspective of the partnership needs. Florida university faculty members who have received funding from NASA in the last year will serve as the sample. We chose these members because they provide a pool of faculty which have been involved in research activities related to the aviation/aerospace industry. The third data collection effort focuses understanding the broad themes of the partnership issues from an industry perspective. A series of interviews will be conducted with educational representatives of the major aviation/aerospace organizations in Florida. Both the faculty survey and industry interviews will provide qualitative data to compliment the quantitative data of the industry survey. Table 1 provides the set of questions to be asked to the faculty and industry representatives.

### Table 1. Questions for Faculty Researchers and Industry Interviews

**Where we are:** 1. In what ways do you think Florida's educational system supports the aerospace/aviation industry? 2. In what ways do you think the aerospace/aviation industry supports Florida's educational system? 3. What positive results have come from your experiences with the aerospace/aviation industry (educational system)? 4. What negative results have come from your experiences with the aerospace/aviation industry (educational system)? 5. What are the strengths of the relationship between the aerospace/aviation industry and Florida's educational system? 6. What are the weaknesses of the relationship between the aerospace/aviation industry and Florida's educational system? 7. What drives you or your institution to build a relationship with the aerospace/aviation industry? (educational system)
**Where we want to be:** 1. How would you describe a successful partnership between the

aerospace/aviation industry and Florida's educational system? 2. What opportunities should the aerospace/aviation industry and Florida's educational system pursue in the next five years to build this partnership?

**How to get there:**

1. How could Florida's educational system be a better partner in the future?
   a. What should Florida's educational system *start* doing to improve the partnership?
   b. What should Florida's educational system *stop* doing to improve the partnership?
   c. What should Florida's educational system *continue* doing to improve the partnership?
2. How could the aviation/aerospace industry be a better partner in the future?
   a. What should Florida's aviation/aerospace industry *start* doing to improve the partnership?
   b. What should Florida's aviation/aerospace industry *stop* doing to improve the partnership?
   c. What should Florida's aviation/aerospace industry *continue* doing to improve the partnership?

The results of the research process are not complete at the time of this paper. The results will be available at the time of the conference.

# Lessons Learned

Based on our experience in developing and executing the research process, we offer the following set of lessons learned/recommendations to others trying to understand partnership issues.

*Involve key stakeholders*. Developing a holistic understanding and plan for statewide partnerships will impact many groups. These impacted groups should be identified and made part of the research process. We spent considerable time establishing common goals, concepts and survey instruments. Involving these stakeholders takes time which must be planned for.

*Publish the research process and questions used*. To help others in developing their surveys and identifying partnership needs, provide easy access to your materials. In some cases studies were easily available while others were not. We tried to build from and extend previous work. This paper is one of our mechanisms for documenting our process. The surveys can be obtained from the authors.

*Focus on future needs*. The intent of this study was to understand what actions we can take today to meet the future needs of industry. Looking at short term concerns will not lead to a broad vision of the future. The focus we chose was understanding industry's needs for long-term growth.

*A connection with industry is needed.* Researchers need access to the up and coming industry practices to determine the items that need to be part of the study. We used industry groups such as Kennedy Space Center, Aviation/Aerospace Alliance of Enterprise Florida, the Florida Space Grant Consortium, and the Florida Spaceport Authority for input. By involving these industry representatives we have created a partnership for the study which models the behavior of a successful partnership.

# Conclusions

The implementation of the three surveys and the working sessions will occur in the spring of 1998. We hope to build a vision of a partnership for shared success. The involvement of industry groups, government agencies, and the educational system demonstrates each partners' commitment to defining a vision for long term growth of the aviation/aerospace industry through educational partnerships.

## References

Berenbeim, R. E., “Corporate Support for Mathematics and Science Education Improvement: Transferring Workplace Experience Into the Classroom”, The Conference Board,1993.

Davies, D., “Actions to Strengthen University Industry Cooperation”, *Technology in Society*, v5, p317-323, 1984.

The Kitchen’s Group, “The Aviation/Aerospace Industry Survey”, August 1997.

Levy, J. C., “Are Research Funds to Engineering Schools of Real Benefit to Industry?”, *Engineering Education*, 77(6), 324-328, March, 1987.

Lewis, J. D., “Making Strategic Alliances Work”, *Research Technology Management*, 33(6),12-15, 1990.

Musick, M., “Partnerships for a Prepared Workforce: Making School-to-Work Connections,” The Conference Board, 1994.

NASA, “Interagency Agreement between the National Aeronautics and Space Administration, John F. Kennedy Space Center, and the Florida Board of Regents, State University System of Florida”, 1997

White, Philip C., “Better Industry-University-Government Cooperation – Why and How”, *Research Management*, January, 1973.

Zimmerman, Sam, “Expanding School Resources With Business/School Partnerships”, National School Public relations Association, *Education USA*, Arlington, VA, 1987.

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