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ABSTRACT

During a 4-year period, the University of Rhode Island (Kingston) developed the International Engineering Program, a German-language focused model for undergraduate education in international engineering. The faculty in the College of Engineering and the German Section of the Department of Languages cooperated to develop the program. By expanding the undergraduate engineering experience to 5 years, students earned a Bachelor of Arts degree in German and a Bachelor of Science in one of the engineering disciplines. Students in the program took specialized technical German language courses as well as traditional courses in the German major, spent 6 months of the fourth year in a professional internship with an engineering firm in Germany, and took a capstone interdisciplinary engineering course offered in German by bilingual engineering faculty. Program organizers faced the challenges of recruiting and retaining students for the program, developing specialized German language courses with technical content, recruiting and training language faculty for teaching these language courses, and arranging internships abroad with engineering firms. The program brought prestige to the university and led to positive interaction with international firms in the region. The program graduated seven students in 1991. Appendixes contain two journal articles and notices describing the program. (JB)

Grantee Organization:

The University of Rhode Island
Department of Languages
Kingston, RI 02881

Grant Number:

G00873047389

Project Title:

A Pilot Program in International Engineering

Project Dates:

Starting Date: September 1, 1987
Ending Date: August 31, 1991
Number of Months: 48

Project Director:

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FIPSE Program Officer:

Sandra Newkirk

Grant Award:

Year 1: $41,982
Year 2: $51,189
Year 3: $53,041
Year 4: $7,992
Total: $154,204

Project Summary: A Pilot Program in International Engineering

With the cooperation of faculty in the College of Engineering and the German Section of the Department of Languages, the University of Rhode Island has developed a successful model for the preparation of students for the international dimensions of today's technical disciplines. By expanding the undergraduate engineering experience to five years, the International Engineering Program offers students the opportunity to earn a Bachelor of Arts degree in German while pursuing the Bachelor of Science in one of the engineering disciplines. Students in this program take specialized technical German courses as well as traditional courses in the German major, and spend six months of the fourth year in a professional internship with an engineering firm in Germany. In the fifth year, a capstone interdisciplinary engineering course is offered in German by bilingual engineering faculty. The IEP was developed at the University of Rhode Island with FIPSE support from 1987-1991, and is now a regular part of the University's offerings.

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Executive Summary

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A. Project Overview:

German language and engineering faculty have joined together at the University of Rhode Island to address the need for a broader and more international education for students preparing to work in the modern fields of technology. With German as the language of the pilot program, URI has developed a five-year undergraduate curriculum leading simultaneously to the Bachelor of Science in one of the engineering fields and the Bachelor of Arts with a major in German. This model includes specialized German language courses for students in technical fields, a six-month internship with an engineering firm in Germany, and a senior-level engineering seminar taught in German by German speaking engineering faculty.

The program organizers have been faced with numerous challenges during the duration of the grant: 1) Recruiting and retaining students for a rigorous and demanding program of study. 2) Developing specialized German language courses with technical content. 3) Recruiting and/or training language faculty for the teaching of German through technology. 4) Arranging internships abroad with engineering firms for advanced students in the program.

The IEP is fully in place and an accepted part of the institutional offerings today. Engineering and language faculty have found the project equally rewarding. It has led to a substantial increase in the number of German majors, and has likewise helped to recruit capable and motivated students to

the university's engineering programs. The IEP has brought prestige to the university for its contribution to international education. The program has also led to positive and fruitful interaction with international firms in the New England region. The IEP organizers see the program as a successful partnership which has helped bridge the gaps between traditionally disparate disciplines within the structure of the university, and between higher education and organizations of both the public and private sector.

B. Purpose:

It is typical for engineering programs throughout the country to ignore foreign language and culture studies, whether as an entrance or program requirement. Inasmuch as the engineer today often works within the global marketplace, the typical American engineering graduate enters the marketplace with a significant handicap, especially when compared with his/her peers from other industrialized nations. Our economy suffers today, in part because we do not understand the needs of our trading partners, in part because we are ill prepared to deal with them beyond our own cultural boundaries. The IEP is a model program designed to address this issue.

C. Background and Origins:

The International Engineering Program evolved from an initial discussion between Dr. Hermann Viets, Dean of the College of Engineering, and Dr. John M. Grandin, Professor of German. Concerned with the lack of attention to foreign language learning throughout the nation, and specifically within the scientific and technical communities, Viets and Grandin believed that changes were necessary to prepare students for the international careers many would be facing. After consulting several German-speaking and German-interested faculty in the College of Engineering, a committee was formed to explore avenues for integrating foreign language learning into the engineering curriculum.

Due to the fixed and demanding nature of the existing engineering programs, the IEP committee realized that significant change could only be achieved through an expansion of the typical eight-semester time period. The concept thus evolved of a five-year program, which would lead to two degrees. Though many doubted that students would opt for a program involving a whole fifth year, the committee decided that the benefits of a second degree and a six-month internship abroad would outweigh the disadvantages. With the help of FIPSE, therefore, the concept of the IEP was launched and announced for the fall semester of 1987.

D. Project Descriptions:

The major tasks facing the organizers of the International Engineering Program may be divided into four areas: 1) Recruitment and retention of students. 2) Development of special German language courses for engineering students. 3) Faculty development for the German staff. 4) Development of internship program with German firms abroad.

1. Recruitment and retention of students: To the pleasant surprise of all involved, students at URI have shown that they are aware of the need to prepare for a global marketplace. Although engineers were formerly rare visitors to language classes, the new program has encouraged many to consider this option. Each fall semester approximately 40 freshmen engineering students now register for the beginning German course, thereby declaring their potential interest in the IEP. Of these, experience has shown that about one-third will complete the program and graduate with both degrees. Although satisfied with these numbers, the IEP organizers continue to work on both recruitment and retention; American attitudes toward international education do not ensure an automatic continuation of the program from year to year.

2. Development of technical German language courses: With the belief that students will be more highly motivated by a language course pertaining to their content interests, the IEP has separated the engineering students from other language learners for the first six semesters of the German language learning sequence. This enables faculty to treat math, science, engineering, and business topics which are desirable background for students planning to intern with firms in Germany during the fourth year. Designing such courses has been a difficult task, primarily since pedagogical materials are not available. Though demand is growing for content-based language instruction, faculty working in these areas now must create their own materials.

3. Faculty development of the German staff: Since the typical training for German language faculty is in German literature, few faculty are prepared to teach technical content in their courses. We have dealt with this problem through self-training, and also by recruiting two instructors with the capability of incorporating technical materials into their language courses. In addition we have invited content-area specialists from the disciplines to teach segments of our courses. The senior level engineering seminar is taught in German solely by engineering faculty.

4. Development of the German internship program: It has been a major undertaking to arrange paid internship opportunities for students with engineering firms in German-speaking countries. With the help of local international firms and agencies such as the German Consulate in Boston, however, it has been possible to place each student to date. We currently have contact with over twenty German firms which are eager to participate, often seeing it in their own interest to help educate American engineers with bilingual abilities and intercultural skills.

E. Project Results:

The IEP has become a part of the University of Rhode Island, and is recognized as a viable model for other institutions planning to internationalize their engineering curricula. Pennsylvania State University is planning to follow our model, as is the University of Maryland. URI has recently been contacted by Cornell University which is planning an international dimension to its technical programs. The IEP faculty have worked together with faculty at several engineering institutions throughout the country to encourage the process of internationalizing American technical curricula.

The IEP graduated its first seven students in 1991. Three decided to attend graduate school in engineering, and the others immediately found positions with international firms. It is anticipated that the program will graduate approximately the same number of students each year for the next two years; numbers should gradually increase after that point.

IEP faculty have been active in disseminating the results of their work at professional meetings throughout the country. Several articles have appeared and numerous conference sessions have been organized (see full report). The German faculty have contributed to a national professional debate among foreign language faculty on the proper roles and missions for departments of languages in higher education. IEP faculty find themselves in a leadership position among Germanists who believe that language departments should teach across-the-curriculum and not just within the traditional literary boundaries.

F. Summary and Conclusions:

The IEP faculty have become sensitive to the role of foreign language and international studies in the struggle to keep our nation competitive economically, politically, and culturally. It has been the American tradition to let the rest of the world come to our doorsteps, and to view ourselves as the ongoing leaders in all segments of society. Our project has shown,

however, that America lags in many areas and that much effort must be expended in order to bring our young people to the educational levels of their peers throughout the world. The IEP is one small contribution toward this end.

G. Appendices:

(see full report)

C. Full Report

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The program organizers have been faced with numerous challenges during the duration of the grant: 1) Recruiting and retaining students for a rigorous and demanding program of study. 2) Developing specialized German language courses with technical content. 3) Recruiting and/or training language faculty for the teaching of German with technology components. 4) Arranging internships abroad with engineering firms for advanced students in the program.

The IEP is fully in place and an accepted part of the institutional offerings today. Engineering and language faculty have found the project equally rewarding. It has led to a substantial increase in the number of German

majors, and has likewise helped to recruit capable and motivated students to the university's engineering programs. The IEP has brought prestige to the University of Rhode Island for its contribution to international education. The program has also led to positive and fruitful interaction with international firms in the New England region. The IEP organizers see the program as a successful partnership which has helped bridge the gaps between traditionally disparate disciplines within the structure of the university, and between higher education and organizations of both the public and private sector.

B. Purpose

This project has addressed a number of long-standing problems in higher education. In the largest sense the International Engineering Program is concerned with education for American competitiveness. Recent events have brought our attention once again to the fact that we are handicapped as a nation by our ignorance of the languages and cultures of the rest of the world. We ask naively, for example, why the Japanese do not buy more of our cars, even though they are not designed for Japanese tastes or needs. The current balance of payment figures, the state of the economy in general, and the resulting need to market abroad, whether in the united Europe, the Far East or elsewhere in the world all point to the fact that we must do everything in our power to prepare today's students for interaction in an international marketplace.

The challenges of international education are significant. Professional school curricula are generally highly prescribed and rigidly defined by national accreditation standards. Educational institutions are plagued with age-old traditions resulting in a high degree of compartmentalization. Language and culture studies are typically viewed as subjects for liberal arts students, while math, science, and technology are reserved for the engineer. The idea of crossing educational cultures is sometimes as prohibitive as convincing the American public in general of the importance of attention to the cultures and languages beyond our national borders. To be convinced of these problems one need only study the curricular requirements of schools across the country. Engineering colleges, for example, rarely require high school foreign language as an entrance requirement, and even more rarely expect their students to study language or culture at the post-secondary level.

The blame for the high degree of compartmentalization within higher education does not lie with the professional schools alone, however. Foreign language faculty tend to view themselves first and foremost as specialists for the study of national literatures, and only secondarily as teachers of foreign

languages. Traditional language department faculty do not view the internationalization of the engineering curriculum or the preparation of professional school students for work abroad as a legitimate part of their mission.

The challenge of this project was, therefore, to find an effective way to integrate foreign language and culture study with engineering education in spite of structural hurdles, ancient traditions, and outdated national attitudes. The success of the project is evidence that times are changing, i.e., that the American public is aware that we must think and act more globally, and that educators now recognize the importance of a more rounded program of studies for careers in a truly intercultural world. This project has shown that the study of language and culture can be the catalyst to bridge the gap between the humanities and technology. Foreign language has sufficient pragmatic value today to be of interest to the professional school program. Though the point of contact may be primarily of practical value initially, language study becomes the avenue for educating the professional school student in a broader and more liberal manner.

C. Background and Origins

The University of Rhode Island is a medium sized land-grant institution with an undergraduate body of 10,000 students. The existing strength of the German Section of the Department of Languages and its commitment to working with the professional schools to help prepare students for international careers was critical to the basis for this project. The German Section is the home of the annual intensive summer program, the German Summer School of the Atlantic, a program subsidized by the German government. The German Section had also worked for several years prior to this project to encourage business majors to minor in German, and had some experience arranging international internships for students in this group.

With the arrival of Dr. Hermann Viets as the Dean of URI's College of Engineering, the German Section discovered an ally for things German and likewise a person cognizant of the need to train today's engineers to think and act internationally. His enthusiasm for an interdisciplinary project soon spread to several of his faculty who likewise either spoke German or enjoyed significant research connections with colleagues in Germany. A committee was formed to explore possible ways to integrate German language study into the engineering curriculum.

As indicated above, the initial enthusiasm of this group soon met several obstacles. First, the engineering programs include almost no free electives, and the existing general education program provides room for only one semester of a foreign language. The options for integrating foreign language and culture into the engineering program were limited. Students could: 1) take language courses on an overload basis. 2) study language in the summers. 3) take additional language courses as free electives and thereby lengthen their undergraduate curriculum. The committee realized that options 1 and 2 were unrealistic and feared that option 3 would likewise be unpopular. If students were to extend their course of study, they would need to receive an additional reward, e.g., a second diploma, a certificate, or some other form of respected recognition for the added work. We felt at first that students studying an extra year might deserve some form of masters degree, such as a Masters of International Technical Studies. This idea was dismissed, however, since the students would not be taking any courses at the graduate level.

D. Project Descriptions

The URI joint College of Engineering - German Section committee chose to explore the option of a five-year BA/BS program through which students could complete all requirements for the German major as well as those for any one of the engineering disciplines. It was determined that this could be done through a rigorous five-year schedule, which would allow one semester for an internship with a firm in Germany. Though the overall concept would make sense with several possible languages, German was selected as the language for the pilot program. The interest of the faculty committee, the presence of several German-speaking engineering faculty, and the commitment of the German language faculty to a program of this nature all contributed to this decision. A proposal was submitted to FIPSE to establish the IEP in the form of a German language model, with the understanding that the model would potentially serve for parallel programs in other languages as well.

The project met initially with a fair amount of skepticism on the part of both committee members and others, who raised many questions: How many students would actually agree to a fifth year of studies in order to learn German? Wouldn't this detract from the engineering studies? Who needs this kind of a program? After all, the Germans have all learned English in school! Can the German Section teach technical content in their courses? Where will the internships come from? Anybody working on this project will never be considered for tenure or promotion! And so on and so forth.

E. Project Results

Once funded and thereby provided with both resources and the prestige of having attracted FIPSE endorsement, the project directors enthusiastically accepted the challenge of moving from concept to reality. The major tasks facing the organizers of the International Engineering Program were clear and may be summarized as follows: 1) Recruitment and retention of students. 2) Development of special German language courses for engineering students. 3) Faculty development for the German staff who had never taught courses of this nature. 4) Development of the internship program with German firms abroad.

Recruitment of students: Since it could not and cannot be assumed that students planning engineering careers will readily opt for a program involving extra subjects and extra time, we decided at the outset to place an emphasis on recruitment. Once assured of funding we began in the summer of 1987 to write to incoming engineering students to inform them about the grant and the concept of both a BS in engineering and a BA in German. Our original hopes were to attract a small group of approximately ten engineering students who would enroll in a beginning German language course and, if adequately motivated, become committed to the ideas of the program. A survey of approximately 200 incoming students indicated interest on the part of 87 students, 45 of whom actually enrolled in a beginning German class. We were delighted to create two sections of beginning German solely for students of engineering.

Since the fall of 1987 the pattern has been very similar. We contact all students interested in engineering at URI, inform them of the program, the specialized German classes, the potential internship in Germany, the long-term benefits of second language fluency, a broader liberal education, and so forth. The results have been approximately the same each year. Of an incoming engineering class of nearly 200 each year, approximately 40 students enroll in the beginning German language class.

We have expanded recruitment efforts by sending mailings out to math and science teachers in the area schools, to German teachers in the Northeast, and by sending teams of IEP students out to local high schools. Without hard data to back up our assumptions, we sense that we are well known for our creative program. Often we hear from teachers and often we receive written inquiries from high school students who are interested in preparing for an international career in this way. The College of Engineering recognizes the IEP as a good recruiting device for their fields. The IEP has

become the deciding factor for several good students who have chosen URI over other schools.

Because of the slow evolution of American attitudes toward international education, we believe that the future success of the program will depend upon continued recruitment efforts. The public still does not associate engineering and science study with an international setting; nor does it expect that the American engineer will ever have to use another language in order to conduct business successfully. We who run the program often see ourselves as missionaries for a difficult cause, which will, nevertheless, be critical to the future well-being of our nation.

Retention: Many students are attracted to the IEP by its attractive features of second-language acquisition, an internship abroad, and the promise of preparation for an international career. As is the case for engineering freshmen in general, however, many want the outcomes, but are not ready to invest the necessary work to achieve them. We have found that 50 % of the students entering the program complete a full-year of German, pproximately 35% of the original number complete the second year, and approximately 25% go on to complete the program with both degrees. Many students find engineering simply too tough; some decide they can do engineering, but cannot do both; some simply disappear from either curriculum, and others decide to stay with language studies without completing the engineering program.

Although we would like every student to complete both degrees, we are satisfied to have at least exposed each of the beginning students to a second language and culture, and the idea of international engineering. Because of the demanding nature of a double degree program, we have recognized from the beginning that only highly motivated and gifted students would be able to complete the program. Not only does the IEP require academic rigor, but also certain personal maturity and character traits which will adapt well to an international environment. Occasionally it is the brightest student who does not continue, for fear of being unable to deal with different cultural values or new situations.

Because of the complex set of challenges in this program, its success requires the presence of a very committed faculty. Those who wish to put a minimum effort into teaching, who are unwilling to spend time with the students outside of class, and who are not themselves committed to the concept of the IEP will not sustain it. The program demands faculty who like students, who are willing to counsel, tutor, and encourage them, who are

willing to arrange company tours, mentoring programs for older and younger students, and so on.

The rewards for extra work have, however, been manifold for the faculty involved. To see the students grow through the years, succeed in their internship positions abroad, become impressively fluent in German, and eventually place themselves in high demand in the job market has been extremely gratifying. In 1991 the first seven students graduated from URI with both degrees. Of these seven, three chose to continue their studies in graduate school, while the other four immediately landed positions with international firms.

Specialized German language courses: The IEP has remained committed from the beginning to the idea of separating engineering students as a language learning group over the first six semesters of the program. We continue to believe that engineering students will be more likely to begin and continue language study if given the opportunity to do so with their own peers and in courses which focus more on the contents of their professional interests. In addition to content orientation, homogeneous grouping simplifies other aspects of program organization. With students together, it is easier to bring guest speakers to them, to make plans for group activities such as a visit to an international firm, to make announcements about internship opportunities, summer employment with partnership companies, and so forth.

Designing a specialized six-semester sequence of German-for-engineering courses has been and continues to be a major task for the German language faculty. Language faculty are, first of all, not trained to teach language through subjects other than general culture and literature. Secondly, the textbook market provides close to nothing in the way of engineering related materials for German language instruction. The German faculty, therefore, had to train themselves and create appropriate materials for their classes. Both of these tasks are ongoing.

The issues of content-based instruction in foreign language classes is emerging as a national issue in the profession, for which our faculty have assumed somewhat of a leadership position. Much of what we have learned is appearing in print in a volume published by the Northeast Conference (see bibliography), to which we would refer interested persons. Where does one turn for materials if one wishes to build a lesson on civil engineering issues, calculus, basic physics concepts, or modern chemistry? What are the sources? Which are the sources to avoid? What are the pitfalls? What works? What does not work?

Another issue is sources of help on campus. To what degree can one rely on the students as experts for teaching specialized subject matter in the foreign language? To what degree is it wise to use bilingual faculty from the disciplines themselves? What works? What are the pitfalls? These questions represent the challenges we have faced over the past few years, and which remain to be refined in the coming years. Detailed answers, as far as they are available, are outlined in our publications. These same questions pose a research agenda for us and for a growing number of colleagues throughout the nation for the next years. Teaching languages across the curriculum is a concept gaining greater and greater credibility. We are addressing the issues of this movement through a second FIPSE grant now in progress, simultaneously with colleagues from several other schools in the nation.

At this point we can report that we continue to teach, now as a regular part of our program, a beginning, intermediate, and advanced-intermediate sequence of courses exclusively to engineering students. In addition, we offer a capstone technical German course to fifth year post-internship students, which is taught in German by German-speaking engineering faculty. The latter is considered a major accomplishment for an American institution of higher education, and most likely a first. The course is cross-listed as a both an engineering professional elective and a senior level German language course.

Faculty Development: Ensuring the capability of offering content-based German language courses to engineering students has involved both careful faculty recruitment and retraining of existing staff. It has been necessary to break out old texts to refreshen past knowledge of basic math, algebra, calculus and fundamental science concepts. It has been necessary to read and study magazines and journals dealing with technology issues. At the same time, when recruiting new staff to accommodate the additional student demand brought about by the program, we have been careful to seek people with a background in math and science, and even prior experience in teaching such subjects in German.

Although we have assembled a faculty who is doing a fine job with the program, large issues remain open for the future. Two of our key faculty in the program are instructors without Ph.Ds' who are not in permanent tenure-track positions. Our long-term goal is to demonstrate enough stability in the program to justify new tenure-track positions and therewith true faculty stability. In this process we must also justify at the department, dean's and provost's levels that this is a legitimate avenue for the department

to take, i.e., that it is academically respectable and associated with a recognized research agenda. Fortunately most of the faculty in our department accept the IEP and its implications as an important undertaking with a genuine set of research issues. At the same time we are working with colleagues in foreign language departments throughout the nation, who also believe in the legitimacy of applied language teaching among the many missions of a department of languages. We recognize, however, that there are still many who oppose anything but literary scholarship as the raison d'etre for American foreign language study, and that this struggle will go well into the future before being finally resolved.

As may be seen in the enclosed bibliography of articles in print and papers presented at professional meetings, we have taken a very active role nationally in disseminating our work and in participating in the debate among foreign language professionals about the goals of language teaching. We consider ourselves to be among the leadership in the area of applied language teaching and the foreign languages across the curriculum movement.

Internship Program: Sending advanced IEP students abroad to six-month professional internships is a critical part of the entire program. It is important first of all as a motivational tool. Students are attracted to the IEP by the idea of living in Germany and working for a company as part of their undergraduate curriculum. Furthermore, it is the proving ground for the goals of the program. Students are sent abroad to live in the culture they have studied and to speak the language and ultimately refine their skills to the point of effective fluency. They are also sent abroad to work as practicing engineering interns and to experience their fields as practiced in the German environment.

The primary goal during the funding period was to establish sufficient contacts with companies and agencies abroad to ensure the promise of the internship extended to students staying with the program. This has not been a simple task, but has been achieved; each qualified student has been placed in a valuable internship experience to date. We now have adequate contacts to place limited numbers of qualified students from other universities as well as all of our own students.

Contacts were made first with regional subsidiaries of German firms and with several regional American firms who do substantial business in Germany. These were supplemented through assistance from the German Consulate in Boston and various other agencies and persons learning of our efforts. Project Director John Grandin and Dean Hermann Viets of the

College of Engineering have made four annual trips to Germany to visit with firms interested in our program's goals. It has been rewarding to find the idea of the IEP endorsed by almost all companies contacted. German firms are accustomed to student interns in their midst, and likewise find it to be in their interest to train American engineers to be culturally at home with their goods and services.

The development of the internship program and format is described in detail in the appended article which is also referenced in the enclosed bibliography. A study is currently in progress which will attempt to quantify in a consistent manner what it is that students learn from such an experience. All interns have been required to keep a journal while abroad and to fill out a questionnaire upon their return. We have not felt it wise to draw conclusions from this material until greater numbers have reported to us. In general, we have been extremely pleased with the students' abilities to adapt to the new situations and to gain the most from the six months abroad. Feedback from the companies has been positive, and, to date, five students have either found or been assured of permanent employment as a result of the experience. The following lists the actual internship placements:

Internship Placements 1990-1992

Spring 1990

Lisa Fagnant
C. Stiefelmayer KG
Esslingen

Thomas McLaughlin
Hoechst AG
Frankfurt

Lyn Plante
Siemens AG
Munich

Michael Wenisch
Siemens AG
Erlangen

Charlotta Olmstead
Schroff GmbH
Karlsruhe

Fall 1990

Deirdre Crowley
Theresa DiRaimo
Hoechst AG
Frankfurt

Joseph O'Hearn
Schroff GmbH
Karlsruhe

Spring 1991

Stephen Wojciechowski
Leitz Meßtechnik GmbH
Wetzlar

Barbara Mellodge
Zahnradfabrik Friedrichshafen
Friedrichshafen

William Phelps
Uvex Winter Optik GmbH
Fürth

Xin Yu
Lenze GmbH & Co.
Hameln

Maryann Onofrietto
Schunk Automation
Bonn

Allen Brandt
Digital Equipment GmbH
Munich

Spring 1992

David Bernbeck
Zahnradfabrik Friedrichshafen

Christien Vaillancourt
Hoechst AG
Frankfurt

Jean-Pierre Sabourin
Ewag GmbH
Solothurn, Switzerland

Fall 1992 (in planning stage)

Trevor Macko
Lufthansa
Hamburg

Stephen Miskelley
TRW
Saarbrücken

Joshua Slocum
Klingelnberg Söhne

Walter Giraitis
Leitz Meßtechnik GmbH
Wetzlar

Jill Jubin
Hoechst AG
Frankfurt

Dissemination: Inasmuch as the faculty involved in this project have viewed themselves as pioneers, breaking new ground for both engineering and language faculty, a major effort has been made to share the progress of our work with colleagues throughout the country. The URI project has been fortunate to coincide with related work of faculty from other institutions experimenting with content-based language courses as well as with the internationalization of professional school curricula. The attached list of conference presentations and publications is indicative of the degree to which the University of Rhode Island has taken an active role nationally in working with other colleagues throughout the country to stimulate change in the way language is taught and in the way professional school faculty think of the preparation of their students. Content-based language instruction and foreign languages-across-the-curriculum are concepts with much greater familiarity today than five years ago.

The German faculty at URI find themselves in demand as authorities for topics pertaining to this project. The AAC and ACE are both preparing monographs on international education; each will include our project as an

example of a successful and replicable model. The ACE has launched a large dissemination project on behalf of creative innovation in foreign language education entitled "Spreading the Word." This large NEH funded project has selected the interdisciplinary German model at URI as one of their mentor programs to be included in their effort to help other institutions. We are commonly called upon by both language and engineering faculty at schools throughout the country for advice on developing joint language/ engineering curricula. We have seen parallel programs emerge at Penn State, at the University of Maryland; international engineering projects are also underway at Cornell, Purdue, and Cincinnati, each of which has used us as a reference point.

Publications Evolving from Project:

"German and Engineering: An Overdue Alliance," Die Unterrichtspraxis, No. 22 (1989), pp. 146-152.

"Deutsch für Ingenieure: Das Rhode Island Programm," in Das Jahrbuch Deutsch als Fremdsprache, Vol. 15, (Fall 1989), pp. 297-306.

"Language and Engineering: The Next Step," Proceedings of the Clemson Conference on Language and International Trade, ed. S. Carl King and Sixto E. Torres (Clemson, South Carolina: Clemson University, 1989), pp. 29-42.

"Developing Internships in Germany for International Engineering Students," Die Unterrichtspraxis, No. 2 (1991), pp. 209-214.

"Foreign Language Education: An Agenda for the 1990's," to be included in a forthcoming volume edited and published by the United States Department of Education (in press).

"The Changing Goals of Language Instruction," (with Kandace Einbeck and Walter von Reinhart), in Languages for a Multicultural World in Transition, ed. Heidi Byrnes (Northeast Conference, 1992), in press.

"The International Engineering Program at the University of Rhode Island," to appear in the proceedings of the Brown University Conference on Language and Content: Discipline-Based Approaches to Language Study, October 1991.

Conference Presentations on Project:

"Launching an International Engineering Program," at the Eastern Michigan University Conference on Languages for the Professions in Ann Arbor, Michigan, April 18, 1988.

"International Engineering at the University of Rhode Island," at a conference on Languages and Technology, University of Bath in Bath, England, March 1988.

"URI's International Engineering Program," presented at the Second Annual Perspectives on Technology Symposium, University of Rhode Island, October 5, 1988.

"The International Engineering Program at the University of Rhode Island," presented at the Clemson Conference on Language and International Trade. Clemson, South Carolina, March 9-11, 1989.

Organized and chaired session on International Engineering and presented paper on "The International Engineering Program at the University of Rhode Island," at the Eastern Michigan University Conference on Languages for the Professions, Ann Arbor, Michigan, March 30 - April 1, 1989.

Organized and chaired session on "Expanding the Horizons of Foreign Language Education" at the annual project directors meeting, U.S. Department of Education, Fund for the Improvement of Post-Secondary Education, Washington, D.C., October 20-22, 1989.

Organized and chaired session on "Teaching German to Students of Engineering: The Rhode Island Model," at the annual meeting of the American Association of Teachers of German, Boston, Massachusetts, November 17-19, 1989.

"Developing Internships in Germany for International Engineering Students," presented at the Conference on Foreign Languages for the Professions, Eastern Michigan University, May 1990.

"Foreign Language Education: An Agenda for the 1990's," presented at the FIRST/FIPSE Conference on Partnerships to Improve Student Learning, Washington, D.C., September 16-18, 1990.

Organized and chaired session on "German Across the Disciplines: Science and Technology," at the Eastern Michigan University Conference on Language for the Professions, Ypsilanti, Michigan, April 3-5, 1991.

Co-presented session on "Building Bridges to the Bridge Builders" at the annual Northeast Conference on the Teaching of Foreign Languages, New York City, April 25-28 (with Kandace Einbeck and Lisa Fagnant).

Organized and chaired a conference on Content-Based Instruction and German-Across-the-Curriculum held at the University of Rhode Island, July 19-21, 1991.

"The University of Rhode Island's International Engineering Program," presented at the Brown University conference on Language and Content: Discipline-Based Approaches to Language Study, October 19, 1991.

"German Across the Disciplines at the University of Rhode Island," presented at the annual meeting of the American Association of Teachers of German, Washington, D.C., November 24, 1991.

"Foreign Languages for 1992," keynote address at December 3, 1991 meeting of the Rhode Island Foreign Language Association.

Organized a session on "German for the Professions at the University of Rhode Island," to be presented at the Eastern Michigan University Conference on Language for World Business and the Professions, Ypsilanti, Michigan, March 1992.

F. Summary and Conclusions

International engineering is here to stay. To suggest otherwise is to deny the course of world history over the past thirty or so years. There was a time when language departments could isolate themselves as a small but elite area of the humanities, and when engineering schools could scoff at the need for a liberal and international education. For a period of time in the post-World War II era America was in control of both its own and the world's destiny. During this short-lived period the ugly Amercan could dominate the global economy and interact exclusively from the perspective of the American language and culture. Today, however, many other nations have reached parity with and even surpassed American levels of sophistication in business, technology, and other forms of human endeavor. If Americans are to maintain their status as a world power, then they must prepare themselves to interact with the members of other nations on a partnership basis. A

prerequisite for any true partnership is mutual understanding and respect, which, in turn, presupposes a knowledge of and appreciation for each other's language and culture. Americans have a long way to go to achieve the knowledge required for responsible global partnerships, but the state of the world no longer leaves this as an option.

URI's International Engineering Program appears to be on solid ground. The commitment among both German faculty and faculty in the College of Engineering is strong. Indeed, there is discussion of soon expanding upon the German language model to include French as a second European language and to introduce Japanese or Chinese as a language and culture to prepare engineers for the Far East. Whatever its own future may be, the IEP remains a viable model which has attracted attention throughout the country. It has generated interest and stimulated the establishment of parallel or similar programs at several other schools. FIPSE and URI can be proud of having participated in the forefront of what promises to be a lasting evolution in American higher education.

G. Appendices

I can only sing praises for the staff of FIPSE and for the opportunities FIPSE has provided for the evolution of international engineering. We at URI had a good idea at the right time, but without help from FIPSE, this program simply would not have happened.

Higher education has difficulty changing and adapting, even when the national priorities are staring us in the face. A few of us here at URI had a sense of what needed to be done and what could be done to bridge the gap between engineers and humanists, but we were also awe-struck by the obstacles. The idea of asking large numbers of engineers to study language seemed almost absurd. The idea of asking language faculty to put Goethe on the shelf for a while in order to attract a new audience and revamp the way we teach also seemed undoable. But, we wrote a proposal, and you gave us encouragement and $155,000.00.

I praise FIPSE for its willingness to take chances and its fundamental belief in the human ability to change and improve. Your role is not just to hand out dollars, but to provide our ideas with prestige and credibility, and then to be there with suggestions and support when the going gets rough. I see FIPSE as the hub of a spoked wheel for the nation's network of reform in higher education. The hub connects us with like-minded faculty elsewhere, who strengthen us and each other and help to refine the ideas which will

ultimately survive. I love coming to the FIPSE meetings, to learn of other projects and see what the potential is for universities in coming years. I frankly will feel a large void in my own professional career when time completes my connection with FIPSE.

Die Unterrichtspraxis/ Teaching German

A Publication of the American Association of Teachers of German

Volume 22, Number 2, Fall 1989

German and Engineering: An Overdue Alliance

John M. Grandin
University of Rhode Island

What do an aerospace engineer and a Kafka scholar have in common?[1] At the University of Rhode Island the answer is a strong interest in the German language and cultures, a belief that the American educational system must be responsive to national needs, and the confidence that tradition should not prevent distant ends of the university from collaborating in a healthy way. Though these affinities might have led only to lofty platitudes some years ago, the changing world economy and the new international competitiveness have provided the framework within which cooperation between two such educators is now not only possible but necessary. America leads the world in technological expertise, but falls short when it attempts to communicate its knowledge in the world marketplace. The time has come for the Germanist and other humanists to join forces with the technologist to provide the next generation of American professionals with all of the tools necessary for productive, fulfilling, and rewarding careers in the global workplace.

The aerospace engineer mentioned above is Dr. Hermann Viets, Dean of Engineering at the University of Rhode Island, the Kafka scholar is a Professor of German and Associate Dean of the College of Arts and Sciences (as well as the author of these pages). What began just a few short years ago for these two persons as casual conversation about the plight of our culture-bound and monolingual society, grew into the conviction that the University of Rhode Island had both the resources and the will to create a working educational relationship between the German faculty and the College of Engineering. The German Section had a history of commitment to German for the professions, and several of the engineering faculty were deeply interested in German and Germany, some by virtue of their fluency in the language, others through their research contacts with colleagues abroad.

Even though there was no historical precedent or model in other institutions, this basis of interest across the disciplines made action very possible. A joint foreign language and engineering committee was appointed to explore the feasibility of a new program combining engineering and foreign language studies. This group was asked to determine: 1) whether there is tangible evidence that it is desirable for technologists to learn a second language; 2) why engineers have typically avoided foreign language study; 3) how engineers might be encouraged to study languages; 4) whether one might be able to find support, financial and otherwise, from educational, governmental, and private sources for the creation of a program to address this issue. The following is a summary of this group's findings and an outline of the International Engineering Program which has been designed at the University of Rhode Island in response to these findings.

Why should American engineers be encouraged to study other languages and cultures? The answer to this question rests in the same evidence cited by those who have argued for and worked toward the internationalization of American business schools. If we are to overcome our failure as a nation to compete successfully in the global marketplace, our professionals must be better prepared to meet and deal effectively with counterparts from other cultures and with market conditions throughout the world. Eastern Michigan University, Clemson University, the Wharton School at the University of Pennsylvania, the University of South Carolina,[2] and many others have acted upon the implications of this fact for the marketing expert, the manufacturer, and manager by internationalizing their business programs. But now it is time to do the same for our engineering programs; we must recognize that it is often the individual with the technical expertise who is called upon to interact with a counterpart abroad; indeed, the manager or sales representative or manufacturer is often a graduate engineer. It is ironic and shortsighted that the American engineer, if judged by the requirements of his/her undergraduate curriculum, is extremely unlikely to have gained any significant awareness of other cultures and languages.

Why is foreign language study not a part of American engineering education? The answer to this question lies in tradition, in the increasing complexity of modern technology, and in the amount of time allotted to the attainment of an undergraduate degree. With the overriding concern for math and science background, few institutions of higher learning demand high school language courses for admission to their engineering programs, and even fewer require foreign language study in the undergraduate curriculum. The stringent demands of the technical subject areas result in a heavy professional courseload which leaves practically no room for elective subjects. Although some engineering programs encourage study abroad, no clear path has emerged for internationalizing that curriculum. Furthermore, with the job market relatively strong, most students are not in search of additional coursework which might provide a competitive edge. Thus, even though the American educational establishment often speaks of the need to unite sciences and technology with the humanities, there appears to be no practical way to do so in the present structure.

Is there a solution to this educational dilemma? After wrestling with the apparent reality that there is no room for meaningful change within the current curricular format, the University of Rhode Island committee began to look at more basic change. By extending the undergraduate program one year, it would be possible to incorporate rigorous foreign language and intercultural study as well as an internship abroad into the engineering program, with no sacrifice to the technical subjects. Even though some of our committee doubted that students would opt for this kind of opportunity if an extra year would be required, we concluded that there was no other way. On this basis evolved the University of Rhode Island's five-year International Engineering Program, which is currently in its second developmental year.

The International Engineering Program, now considered a pilot program by the United States Department of Education, offers students at the University of Rhode Island the opportunity to combine the study of German with their engineering discipline, and to graduate after five years with both the Bachelor of Science in an engineering discipline and the Bachelor of Arts in German. Highlights of this program are: 1) separate German language courses for students of engineering over the first three years of study; 2) a six-month internship in an engineering firm or research institute in a German speaking country during the fourth year; 3) in addition to traditional upper-level German language and literature courses, interdisciplinary engineering courses in the fifth year taught in German by bilingual engineering faculty.

Even though this concept was immediately given strong moral support by faculty and administration in both colleges, the committee members were very aware that this new curriculum could not be adequately tested without some form of external support. In a time of limited resources for a state university, new funds would be necessary to: 1) develop and support the teaching of the new German language courses for engineers; 2) create and nurture the necessary contacts with private enterprise for the assurance of the internship segment abroad; 3) recruit students interested in pursuing the double degree option; 4) provide release time for the overall administration of this very large undertaking. For this reason, the first step in the program's development was to determine what agencies, if any, might be interested in funding the internationalization of professional education, and to hope that one such agency might share our enthusiasm for the idea of international engineering.

After reviewing the various possibilities, the committee decided to enter the annual competition for support from **FIPSE (The Fund for Improvement of Postsecondary Education)**, the branch of the U.S. Department of Education which describes itself as "comprehensive, action-oriented, and risk-taking." In its descriptive literature, FIPSE welcomes proposals which "seek to make postsecondary education responsive to changes in the nation's economy," and likewise those which "strengthen the liberal arts components of undergraduate professionals programs."[3] Believing that an international engineering program would accomplish both of these goals, a proposal was submitted. Although not successful in the first attempt, the committee was encouraged by having been included among the final 100 of an original 2300 submissions. After refining the initial ideas and submitting our proposal once again, we were notified in August 1987 of our success. FIPSE awarded the University of Rhode Island $145,000 over a three-year period to support a pilot project in international en-

gineering linking German language and engineering study.

Why German? Although such a program could well be based upon other languages, both the committee and FIPSE believed that a program limited to one language would develop more systematically as a replicable model. At Rhode Island German made sense as this pilot language for several reasons: 1) URI has a German staff committed to teaching German for the professions. 2) URI also is the home of the German Summer School of the Atlantic, a highly successful residential total immersion program subsidized by the Federal Republic of Germany. 3) URI's College of Engineering has several German speaking faculty who are very supportive of the program's goals and active participants in its development. 4) Moreover, German is a wise choice for the second language of our graduate engineers in terms of the world economy. The Federal Republic of Germany is one of our most important trading partners and one of the world's leaders in high technology. Aside from the fact that many American firms do business with and in the Federal Republic, there are now over 2000 subsidiaries of German firms in the United States. Even though other languages might be an equally sound choice, these facts as well as our contacts with German related private enterprise in Rhode Island strongly encouraged the decision for German as the language of the pilot program.

The International Engineering Program has created a separate three-year German language course sequence for its students. Although some would argue that the basics of German language skills cut across all disciplines, the project leaders saw several reasons to work with the IEP students as a group: 1) Remaining together maintains the awareness of their common academic and professional goals and helps them to overcome the potential fear that they as engineers might be out of their element in a German class. 2) Functioning as a group reminds them on an almost daily basis that they are part of an educational experiment, and builds therewith a certain *esprit de corps*. 3) Since these students share a major subject area and related professional goals, reading material, cultural materials, and general content matter can be oriented to their interests and needs. Even in the first weeks content can be centered on practical daily needs which will face them in Germany during the internship; before long drills can be built around mathematics, physics, and chemistry. 4) By grouping the engineers as language learners, it is simpler to arrange for bringing in outside speakers to address the topic of international engineering: What are the differences between American and European engineers, manufacturers, and business persons? How do the attitudes toward technology and business vary? How can Americans become more effective abroad? 5) Keeping the engineers in a group also facilitates our plan to incorporate team teaching into the German classes. Six members of URI's College of Engineering are fluent speakers of German, who have been eager to participate in the program. As the students get to more complex levels of language learning, the engineering faculty become more crucial. It would be naive to assume that the Germanist trained in linguistics and literature will also be versed in the language of machine design, modern electronics, the finite element method, and so on. The language professional must rely upon his/her colleague from the professional field for technical instruction at this level.

A key segment of the IEP is the internship abroad after the Junior year. After a minimum of six semesters of technical and language-culture studies, students are to be sent to a professional, paid internship of six months duration with a company or research facility in a German speaking country. The internship is an important educational and motivational element in the entire program; it will provide the student with first-hand exposure to the subject area in industry abroad and will also enable him or her to use and further language and cultural skills in a native context.

The URI committee views the internship as the program's focal point, but also as the largest challenge in the developmental period. Will we find enough positions? Will the students be adequately prepared? Will the myriad of details be manageable without more staff and resources? Fortunately the University of Rhode Island has had some experience sending students on similar internships in the past. Furthermore, we have already established a good working relationship with several regional international firms on behalf of the IEP. Through the contacts of the German staff with German based firms and the many contacts which the College of Engineering

has in business and industry, a growing internship network between the university and business has evolved. A two-week trip to Germany in 1987 by Professors Hermann Viets, Dean of the College of Engineering and John M. Grandin, Director of the IEP, revealed a very strong interest on the part of German firms in our project. Every company visited agreed to accept interns who have met our standards of at least three years of German and engineering course work with sound academic achievement.

Since internships depend upon the cooperation of private enterprise, and since the very nature of our program is meant to address the needs of the economy, the committee felt it wise to establish an *Advisory Board* made up of persons outside the University. It was reassuring to experience an immediate positive response to our invitations to business persons and representatives from governmental and educational institutions. Members of the German-American business community have supported us enthusiastically; they have visited us, spoken with our students, invited our students for company tours, and agreed to help with internships. To date, four of the firms represented on the Advisory Board, which are either American companies with German partners or German companies with subsidiaries in Rhode Island, have developed a new model of *sponsorship* for the IEP students. Promising students are employed by these companies as summer interns in Rhode Island after the freshman and sophomore years with the intent of preparing them for a meaningful experience with the company during the internship abroad. This arrangement has many advantages for the program, for the student, and for the companies, who view this as a means of long-term recruiting. It is gratifying to see the extent to which international firms are eager to employ American professional engineers with foreign language capability.

Recruitment of students in the first year. After learning very late in the summer of 1987 that FIPSE would be funding the proposed program, the options for notifying students of the availability of a special beginning German course for engineers were limited. In August a mailing with a return postcard was sent to all 275 incoming freshmen engineers and to most sophomores as well, informing them of the development of this new program. Our committee was very surprised to learn that over eighty students were interested. A quick second mailing with backup registration materials yielded 47 students in two sections of Beginning German for the fall semester. Our committee had anticipated perhaps fifteen students for the first year and was thus both shocked by and delighted with the response.

Now in the second year, the initial group of 47 has reduced itself to 25. Some of the students have found that German is more difficult than originally imagined; others have found engineering to be too demanding with the addition of a foreign language; still others have found that engineering and/or university study is not for them at this point. The attrition is natural and to be anticipated; such a program is rigorous and can be appealing, in the long run, only to the mature and capable student. Our committee assumes that the length of the three-year preparation for an internship is the best selection device for official participation in the program. Experience so far indicates that at least one third of the original group will actually complete the entire BA/BS program.

Recruitment for a new class of beginners for the fall of 1988 became a priority. Notification of this educational opportunity was sent to engineering applicants and also to all students accepted into URI's engineering programs. We were pleased at the number of responses generated by these mailings which indicated the students' eagerness to enhance their program with an international dimension. Our beginning group in the fall of 1988 consisted again of two sections of incoming students, totaling 39, which is approximately 15% of the new freshmen class in engineering. Assuming similar responses and attrition in future years, the current total of 64 students in the program is expected to grow to at least 125 students once the full five-year cycle is reached.

The first year German course is taught with two overall goals in mind: 1) Since the students who stay with the program will be going to a practical internship in Germany after six semesters of German, they must be prepared to speak the language. For this reason oral skills are stressed from the first day, and given far more attention and weight than in most traditional college German courses. 2) Since the internships will also address their professional development, the students must become familiar with the vocabulary of mathematics, physics, computer sci-

ence, chemistry, and so forth. There are materials currently available for this purpose, and it is possible to integrate these subjects, especially math, at a very early stage of language acquisition. *Grundkurs Deutsch*[4] was selected as the beginning text, since it immediately plunges the student into everyday Germany. Reserving a hotel room, asking the way, hailing a cab, booking a flight, ordering a meal, buying postcards and stamps, and preparing a *Lebenslauf* are topics that help project the reality of the foreign language on the new student. Once the numbers are learned, the first of the *MNF* series from the Max Hueber Verlag[5] on mathematics is introduced. The German staff has been surprised at the ease and rewards of teaching math to the first semester German class. Even though we have always taken pains to use nonprofessional terms to illustrate points of grammar, it now becomes refreshing to replace "ein kleines Mädchen" or "ein grünes Buch" with "ein positives Vorzeichen" or "ein rechtwinkliges Dreieck." It is a bit unusual (and sometimes a bit taxing) for the German instructor who has long since dismissed algebraic terms from daily thought to see the blackboard of the German 101 class filled with geometric shapes or mathematical formulas. The latter provide the basis, however, for quickly learned, controlled dialogue and thus help develop oral skills.

The second year course consists of a mixture of traditional and nontraditional instruction, the latter being complicated by the unavailability of suitable reading texts at this level. The traditional part of the course is structural review and vocabulary building based upon *German in Review* by Vail and Sparks.[6] The latter provides a comprehensive look at the grammar through everyday vocabulary, which is reinforced through related drills on the Macintosh computer.[7] Reading material is primarily from *Aus moderner Technik und Naturwissenschaft* by Zettl, Janssen, and Müller[8] and is supplemented by related materials from *Jugendscala* and the press. The text is unfortunately somewhat advanced for this level, pointing to the need for a good technology based reader for intermediate students.

Enthusiasm remains high among the students. They have been pleased with the courses, and also with the variety of extracurricular activities provided by the program. There have been tours of German based companies; there have been several guest lectures by bilingual engineers as well as by practitioners in the field. In addition to language skills, the students are beginning to learn the differences in attitudes between our two societies regarding business and engineering. Through the guest speakers and occasional grant sponsored lunches with faculty and guests, the students are continually reminded [illegible] tant group and part of an educational experiment which could make a substantial difference in their own lives and also the future of American engineering education. The best sign of the student attitude toward the program is the recent founding of a new student organization on campus, officially sanctioned by the Student Senate: The Society of Students of International Engineering. Through this activity the students themselves are taking the initiative to arrange guest lectures, and other events supportive of the program.

A pleasant by-product of the International Engineering Program is the positive response we have received and the relative ease with which the program has been publicized. The press has reacted with several articles,[9] as has the central administration of the university with both moral and fiscal support. Furthermore, through correspondence with prospective engineering students, the College of Engineering is discovering that the IEP is a good recruiting tool. Students can study engineering at any number of schools, but other institutions do not oifer engineers the opportunity of international education. Students in our program are convinced that they will have added an entirely new dimension to their education, which will not only enrich their lives, but also create new and exciting career opportunities for them. The committee hopes that this kind of positive reception for a language-engineering program will also be helpful to German teachers in the high schools as they seek tangible reasons to motivate students to stay with their German studies.

What is the future course of the IEP? Over the three-year period of the FIPSE grant, we expect to have the program fully in place and institutionalized. Challenges for next year will be recruitment of a new incoming class for the beginning course, planning and preparation for the third-year course as well as refinement of the first- and second-year courses, and the final placement of the first group of students in six-month internships. Our German speaking engi-

neering faculty are also laying plans for the technical courses to be offered in German in the fifth year of the program. The IEP intends to sponsor, perhaps in conjunction with the American Society of Engineering Education, an international engineering symposium in order to raise awareness regarding the problem and to encourage similar programs to be founded at other institutions. Finally, we are launching an effort to encourage the scientific and technical faculty to consider team teaching in the university's general education program with some of the liberal arts faculty. Engineering students will find their way to the arts and humanities more easily when they can see the ties of these subject areas to their own fields. One example is a new ethics course dealing specifically with the engineering profession; another is a topics course in literature focusing on the literary treatment of technology issues.

Inasmuch as the current International Engineering Program is a pilot program intended to serve as a replicable model, our committee sees the current plan as the core of a growing program, both in Rhode Island and elsewhere. Given URI's strength in French and the presence of French-English bilingual engineering faculty, this language and its cultures may well be the basis of our first expansion of the IEP. We are often asked why we have not chosen Japanese as the first language for our program. Although recent developments might suggest this direction, we knew that neither the language department nor the engineering departments had the staff or contacts to develop a program in this area. We hope that our model might provide the impetus for another university to found a parallel program with Japanese as the language, just as a university in the Southwest might build a program with Spanish and engineering.

A formidable challenge will be the funding of the IEP administration once the FIPSE grant has expired. Experience has shown that the program requires far more of a commitment than expected, and that a faculty member will have to be granted release time to handle the overall management, from recruitment of freshmen to final career placement. In light of the program's success for both the College of Engineering and the College of Arts and Sciences and the interest generated throughout the campus, it is assumed that the University will be willing to commit long-term resources to the IEP. Because of the program's successes in the eyes of private enterprise, it is also assumed that external help will be forthcoming. For this reason, the committee is actively searching at this midpoint of the FIPSE support for other agencies and foundations whose interests might coincide with the goals of the IEP.

Aside from the larger organizational challenges, an outstanding issue for the German Section of the Language Department is how to continue to meet the teaching challenges of the numbers of engineering students who were never a factor in the past, without sacrificing other commitments. This has been achieved on a short-term basis by adding staff in the form of a new instructor and a new teaching assistant through the help of the Institute of International Education. The Section has been fortunate to find staff eager, willing, and able to teach to a nontraditional group with the goals described above. For the long-term, however, and for a profession which remains bound to definite traditions, many questions are yet to be answered: 1) Will our profession make room for and encourage young persons who might be eager to specialize in teaching German for the professions? Assuming its institutionalization, will the IEP be able to attract competent and professional German teaching faculty? 2) Will university administrations recognize research in the teaching of German for the professions as a legitimate and therefore promotable area of inquiry? 3) Will the profession accept a program such as the IEP as a proper function of a university German department?

The Rhode Island German Section believes that these questions are all to be answered positively. The IEP has meant growth and prestige for the German program at URI without sacrifice of any traditional elements of the German program. It has created new challenges and additional courses, it has brought new students, staff, and vigor to the department. The Kafka scholar mentioned in the opening lines has become a program director and organizer, indeed even a speaker at technology forums, but not at the expense of his continued commitment to German literature. It must be remembered that the IEP is, among other things, a bridge between technology and the humanities. The next time a Kafka course is taught, the class will have twice as many students and several who would not have been there without this program.

Our experience at Rhode Island has convinced us that internationalism cuts across all disciplines today and provides a common ground for discussion and action among traditionally dis-

parate groups. The International Engineering Program has demonstrated that it is possible for German departments and professional schools to work together with business, industry and government for the benefit of all. Though this might not have been possible even ten years ago, the evolution of the world economy has provided educators with a set of circumstances which could facilitate a long-term change in American higher education. The time appears right for foreign language educators to consider new alliances on the university campus, and to take advantage of new opportunities to challenge the American monolingual mindset.

Notes

[1]An earlier version of this paper was presented at Eastern Michigan University's Seventh Annual Conference on Languages for Business and the Professions held in Ann Arbor, Michigan, April 6-9, 1988.

[2]There are several examples of language department collaboration with colleges of business administration which have been highly successful and provided new directions for higher education throughout the nation: Eastern Michigan University and Clemson University have developed model Language and International Trade Programs, both of which emerged from language department initiatives and funding from FIPSE (U.S. Department of Education). At the graduate level, the American Graduate School of International Management has a long-standing reputation for its linguistic and intercultural preparation of business professionals. The University of South Carolina has also taken a leadership role with its MIBS Program (Master in International Business Studies), as has the University of Pennsylvania with the growth of its international business studies, which are strongly endowed by Leonard Lauder.

[3]*Comprehensive Program. Information and Application Procedures; Fiscal Year 1989*. The Fund for the Improvement of Postsecondary Education, United States Department of Education. FIPSE's address is: 7th and D Streets, S.W., Washington, D.C. 20202-5175.

[4]Roland Schäpers, Renate Luscher, and Manfred Glück, *Grundkurs Deutsch* (Munich: Verlag für Deutsch, 1980).

[5]Hellmut Binder and Rosemarie Buhlmann, *MNF: Hinführung zur mathematisch-naturwissenschaftlichen Fachsprache; Teil 1: Mathematik* (Munich: Max Hueber Verlag, 1978). See also: Rosemarie Buhlmann, *MNF: Hinführung zur mathematisch-naturwissenschaftlichen Fachsprache; Teil 2: Physik* (Munich: Max Hueber Verlag, 1978). Rosemarie Buhlmann, *MNF: Hinführung zur mathematisch-naturwissenschaftlichen Fachsprache; Teil 3: Chemie* (Munich: Max Hueber Verlag, 1978).

[6]Kimberly Sparks and Van Horn Vail, *German in Review*, Second Edition (San Diego: Harcourt, Brace, Jovanovich, 1986).

[7]Computer drills are developed by our own staff using the *MacLang* authoring program, developed by Judith G. Frommer and marketed by Kinko's Academic Courseware Exchange.

[8]Erich Zettl, Jörg Janssen and Heidrun Müller, *Aus moderner Technik und Naturwissenschaft*, Second Edition (Munich: Max Hueber Verlag, 1987).

[9]See "Teaching German to Engineers," in *The Chronicle of Higher Education*, 1 September 1988, A15.

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Leserforum

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To the Editor:

The Fall 1989 edition of *Unterrichtspraxis* included an article about the development of a new five-year program at the University of Rhode Island leading simultaneously to a BA in German and a BS in one of the engineering disciplines (pp. 146-52). The program has met with continued success, and I would like to supplement the recent article with this review of the program's second and third years.

Student Recruitment:

The IEP (International Engineering Program) organizers continue to be pleased with positive student response. In 1987, 47 students were attracted to the specially designed beginning German course for engineers. In the fall of 1988, 39 freshmen chose the same route; in the fall of 1989, 36 students opted to try the International Engineering Program. Although the numbers are progressively somewhat smaller, they have increased in terms of the percentage of incoming engineering students, from approximately 15% to 20%. Unfortunately, engineering enrollments are decreasing nationwide.

Experience indicates to date that about one third of the engineering students who join the beginning German class as freshmen will stay with the program to its intended conclusion. Attrition is high in any engineering program and will be even higher in a dual degree option such as the IEP. Of the initial 47 students beginning in 1987, it is now clear that 15 will complete the program and receive both degrees. Of the second class 15 students remain actively committed. The third class of students is about to enter the second semester of the freshman year; indications are that this group is at least as strong as its predecessors.

The IEP will continue its rigorous recruitment program. The message must be taken to both students and teachers of mathematics, physics, and chemistry that the combination of technology/science and foreign language study is imperative for today's global marketplace, and that such a program can lead to rewarding international career opportunities.

Internship Placement:

As was reported in the *UP* article, the IEP has had considerable success in arranging internships for its students with engineering firms in Germany. In January 1990, the first group of five students in the program, all of whom have had at least six semesters of German language and engineering courses, were sent to six-month, paid positions in Erlangen, Karlsruhe, Esslingen, Frankfurt, and Munich. A second group of five students will be similarly placed in the second half of 1990. Although details vary from company to company, assignments are all aligned with the students' professional interests, each is adequately remunerated by the company to cover daily living expenses, and, in most cases, housing arrangements are provided for the students as well.

Since most companies involved with the IEP are also represented in some way in the United States economy, many of the student interns have already had a work experience, whether in the summer or part-time during the academic year, with the American subsidiary or affiliate in Rhode Island. Partnerships have been developed such as the one between an American machine tool manufacturer in Rhode Island, the Brown & Sharpe Manufacturing Company, and its affiliate in Esslingen, Stiefelmayer KG. Inasmuch as these two firms have become dependent upon one another and anticipate a long-term relationship, it is imperative that they have technical experts in Rhode Island who are familiar with both companies, not only in a technical and business sense, but also linguistically and culturally.

In recent months the program organizers have been pleasantly surprised by numerous unsolicited internship placement offers for IEP students directly from German companies. Since the program now finds itself with many more than the necessary number of internship possibilities, it has begun to discuss placing interns on behalf of other institutions which encourage engineering students to study German. As a result, the Rhode Island German faculty has made a decision to incorporate technical German courses into its summer German language program, the German Summer School of the Atlantic. It plans to recruit engineering students from numerous schools into the six-week summer program and to assist qualified participants in finding engineering internships in the Federal Republic.

DAAD Study Tour:

The spring of 1989 brought a very positive development to the program in the form of a two-week study tour of engineering facilities in the Federal Republic co-organized and co-sponsored by the German Academic Exchange Service. Application was made to the DAAD under the category "Information Visits by Groups of Professors and Students." Since the DAAD is interested in supporting such tours for groups of students with specific and homogeneous interests other than the German language *per se*, and since the International Engineering Program already enjoyed contacts with several engineering firms based in the Federal Republic, our application seemed tailored for this program. Sixteen IEP students thus had the opportunity to preview not only Germany itself, but also several of the firms where they will be spending their six-month internships in the near future. Accompanied by URI German Instructor Kandace Einbeck and a tour leader from DAAD, the group was given red carpet tours through a variety of modern industrial facilities from Wuppertal to Friedrichshafen. Ms. Einbeck provided cultural orientation exercises prior to the trip and structured the entire two-weeks as a "German only" intensive language and culture course. This trip has played a large role in boosting interest in and enthusiasm for the program as well as soothing any anxieties about life in this now no longer distant land. The trip also helped

to promote the concept of the IEP in the eyes of the DAAD and the companies which were visited.

Course Development:

The IEP remains committed to separate German language classes for engineering students from the beginning through the sixth-semester level, and a fifth year engineering content course taught in German by bilingual engineering faculty. The third year course is still in its developmental stages and the subject of debate. Ideally we would like to bring the students to a point of confidence with the professional concepts and literature with which they will be confronted during their internships. At the same time, we wish to create a level of competence in basic spoken German associated with daily life and culture in the Federal Republic. The problems of finding appropriate technical texts and materials are compounded by the fact that materials tend to transcend the technical expertise of most Germanists, who feel much more comfortable with a literary text or more standard culture based subject matter. One answer is to bring persons to the staff with the necessary expertise, e.g., a teaching assistant or faculty member with background in science and math. A second answer is to retrain some of our own staff in basic physics and college-level mathematics. A third answer is to team teach with bilingual faculty from engineering, math and science departments. A fourth answer might be faculty exchange with institutions abroad which have developed expertise in the teaching of German for special purposes such as science and technology. A fifth answer, and alternative to all of the above, is simply to phase the engineering students into the normal third year conversation-composition and culture courses. At this point we are exploring and experimenting with all such options and hope to be able to report our solution in the near future.

The Future:

The International Engineering Program has become a common phrase at the University of Rhode Island and is mentioned with pride by the German staff, the College of Engineering, and the central administration. Even after the third and final year of funding from the U.S. Department of Education, we expect the program to remain a permanent part of the University's offerings. The IEP is a focal point through which the German language gains application and respect in the world of international technology and business. The IEP is recognized and praised by business, education, and government from both the United States and Germany. Indications are strong that the IEP concept will be developed at other institutions and that it will become an important part of American educational reform as the nation rethinks its priorities for the 1990s and beyond.

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Developing Internships in Germany for International Engineering Students

John M. Grandin
University of Rhode Island

The globalization of the world's economy is forcing American educational institutions to reexamine standards and priorities and rethink the traditional curriculum.[1] Competition with Europe and the Far East demands higher standards in mathematics and science instruction, more rigorous recruitment of young people for high-level training in science and technology, and a stronger commitment to research and development. Along with this reaffirmation of the disciplines associated with technological innovation and competitive manufacturing, there is also a clear demand for well-rounded persons with strong intercultural communication skills, i.e., for professionals who speak and write convincingly and possess the skills and flexibility to deal with partners from the entire world. To provide these skills is not a simple matter, however; as a nation we are accustomed to regarding foreign language training as a frill and intercultural expertise as the responsibility of our foreign partners. In order to respond effectively to this aspect of the global challenge, educators who have traditionally been on opposite sides of the campus will have to reexamine their potential for collaboration. Engineers and scientists will have to look to their colleagues in foreign language departments for assistance. language faculty will have to recognize and accept the training of a new generation of international leaders as a major part of their professional mission.

Although these new demands might seem overwhelming, the University of Rhode Island has found them to be an opportunity, which has led to a very rewarding cooperation between the German language program and the College of Engineering. With funding from the U.S. Department of Education (FIPSE),[2] a five-year International Engineering Program (IEP) has been established which leads simultaneously to the BS degree in one of the engineering disciplines and the BA in German. The high points of this program are a specialized three-year sequence of German language classes for engineering students, a six-month internship with an engineering firm in Germany during the fourth year, and a fifth-year engineering course taught in German by bilingual engineering faculty. Currently there are over seventy-five students exercising this option, which seeks to prepare American-trained engineers for the international marketplace in which they are very likely to practice their profession.[3]

The organizers of the IEP view the fourth-year internship experience abroad as a key segment of the program concept. It is first of all a motivating factor and thus a recruiting tool for students who are enticed by the idea of working in a German company during their undergraduate years; it is also the single most important piece of the total educational experience. The internship puts both the engineering and language-culture training into practice, it hones the students' German, teaches intercultural communication, provides concrete application for engineering theory, and offers real exposure to what will face them upon graduation. The internship is also that part of the program which creates a linkage between the university, the student, and the private sector; it offers a chance for business and university professionals to collaborate in mutually beneficial ways, all of which are of importance to the student and to the long-term health of the nation.

Developing a successful internship program in Germany has been a key part of the success of Rhode Island's International Engineering Program and likewise one of the greatest challenges for the organizers. Without a relevant precedent to follow, and with many students eager to pursue the new course of study, Rhode Island had just three years to define, organize and realize numerous placements in engineering-based German firms. What format should such an internship have? Will it be possible to place all qualified students? Will they be paid? Where will they live? What visas are required? What resources are available to assist the organizers? Inasmuch as others may benefit from Rhode Island's work, the following pages are intended to answer these and other questions by tracing the experiences

which began in 1987 and led over a three-year period to the establishment of an open pipeline to the international business community and the placement of URI students as well as qualified international engineering students from other institutions.

What is an international engineering internship?

The IEP internship is understood as a work experience in an engineering firm or research institute in one of the German-speaking countries for a period of six months, through which students are exposed to their profession as practiced in that setting as well as the language and culture of that society. Although the internships vary, every attempt is made to abide by certain constants: 1) The work should call upon the skills acquired through the preparatory years of study in both engineering and German. 2) The students should be assigned to a person or group prepared to nurture and train him or her in this apprentice-like situation. 3) The student should be called upon to live the language and customs of the host company, i.e., no English should be spoken.

Internship vs. Study Abroad

The Rhode Island program views such an internship as a preferable alternative to enrollment and participation in a university of the target society. Study at a university is clearly the more traditional route for American students planning an experience abroad in their field of interest, and perhaps the more likely one to develop, given the lack of American higher education experience in organizing internships throughout the world. Yet, we have found that university study abroad has the following specific disadvantages for students in professional degree programs, when compared to the internship experience: 1) It is very difficult to equate coursework and program requirements in technical fields when moving between cultures. As a result, time is often lost, and the chances for discouragement and disappointment are high. Such reasons are among the most obvious when explaining why study abroad has not been popular for professional school students. 2) Professional studies at a university require a high rate of fluency in the language, and solid prior knowledge of the professional literature in the language. 3) Universities abroad tend to be large, impersonal, and not readily able to offer foreign students a focused professional experience with identified persons. 4) With current exchange rates, any prearranged form of study abroad is expensive and consequently exclusive for students with modest means.

The internship, on the other hand, is not a course *per se*, but rather a work experience in the field with actual practitioners. Students must be adequately prepared as professionals and as communicators in the foreign language, but they will not be asked to read lengthy textbooks or to write examinations. Given a basic ability to communicate in the language and the ability and eagerness to work and to learn in new settings, the internship can be an excellent path to both skill and personal development. It is meant to offer the student a defined context, of both professional and cultural-linguistic dimensions, in which the good student will grow. This author believes that a study abroad experience, insofar as it makes sense for the professional student, would best follow an internship experience rather than supplant it.

Collaborating with the Private Sector

Establishing internship opportunities abroad requires significant contacts in the private sector. These might occur through the help of organizations which aim to accomplish precisely this end, examples being the International Association for the Exchange of Students for Technical Experience (IAESTE), the Carl Duisberg Society, or the German Academic Exchange Service. Assistance might also be found through colleagues at other institutions who have already formed a network of such contacts, a fine example being the International Cooperative Education Exchange Program at Eastern Michigan University. One might also seek a higher education partner abroad who would place American students in Europe in exchange for the placement of European students in the United States. A final option, which is the route taken by URI's International Engineering Program, consists of "hitting the streets" and making direct contacts with firms doing significant business between the U.S. and the Federal Republic of Germany. Although this might sound overly ambitious and unfeasible, it has proven to be very workable and extremely rewarding for several reasons.

The German staff at URI has enjoyed contacts with several subsidiaries of German firms in Rhode Island over the years. Prior to the founding of the IEP, the relationship was informal and

mainly for purposes of good relations between the department and the local German-speaking community. Once it was made known, however, that our department would be joining forces with the College of Engineering and would soon graduate German-speaking engineers, our relationship took on a new meaning for these companies. We learned very rapidly that our "product" was attractive and in higher demand than originally assumed.

The second source of contacts with international firms came through the engineering faculty, for whom collaboration with industry is far more common. Dr. Hermann Viets, URI's Dean of Engineering, co-founder and enthusiastic supporter of the IEP, was immediately able to call upon several CEO's with direct business interests in Germany. Together he and I visited numerous companies, discussed our goals, and sought the advice and help of these persons. Soon an IEP Advisory Board was established, which meets twice annually and whose purpose is to provide feedback to the university and assistance in the build-up of the program.

By the end of the IEP's first year, Dean Viets and I were able to visit twelve firms in Germany, in as many days, and, to our great pleasure, establish twelve openings for our students. German firms are, in general, very eager to have American engineering students serve as interns with them. Each of the companies visited has international interests, including investments and/or close working relationships in the United States. It became clear that language/culture barriers are very real problems for firms dependent upon exchange of technical information, and that most firms with such an orientation welcome any attempt to address this issue, and are prepared to invest directly to assure its success.

To our surprise, the initial contacts in Germany multiplied rather rapidly. By the third developmental year of the IEP, unsolicited inquiries began to arrive directly from Germany, usually from firms with American subsidiaries, who had heard about our project from other firms already working in support of the IEP. At this point the program has a list of over thirty such companies, which actually surpasses the capacity of the current enrollment.

A Partnership with Rhode Island Business

Although our original plan was to seek internships abroad for the IEP students, the presence of numerous Rhode Island firms with strong interests in Germany made it possible to develop several two-phase internships, beginning with a work experience in Rhode Island. One local machine tool manufacturer, the Brown & Sharpe Manufacturing Company, which shares technology, product development and sales with Stiefelmayer KG in the Stuttgart area, and has in the meantime acquired a firm in Wetzlar, was the first to propose a format for partnership between themselves and the IEP. Brown & Sharpe hires two new IEP students per summer and trains them after their freshman and sophomore years. When the students are ready to go abroad to Stiefelmayer or to the subsidiary in Wetzlar for the six-month internship in the fourth year, they are already well trained in the processes, products, aims, goals, and problems of the two firms. The two companies see in the IEP internship a means of grooming their future engineering staffs, who in the next few years will have the added dimension of fluency in German and international communication skills, both of which had been sorely lacking in the past.

This model of partnership between the IEP and Rhode Island business and industry has become the norm which we now regularly pursue. Although we still continue to send students abroad to firms with which we have no Rhode Island connection, we do place students in seven local companies, a list which is growing each year. In the summer of 1990, 15 students were placed with regional engineering firms, each of which will then provide an internship in Germany.

Internship Format

In order to guarantee uniformity of the educational value of the internship, it is extremely important to reach an agreement with the companies involved as to what an internship is, and what it should accomplish. Unfortunately, most American firms are not as accustomed to having a regular flow of apprentices and university interns through their doors as are their counterparts abroad. The danger exists that managers will commit to an internship in ideal terms, but will not have or take the time to ensure that the persons ultimately responsible for the students will know how best to use them. We have found that some companies plan the internship to the minutest detail and assure a daily educational experience. Other companies, however, are so involved with regular routine, that little time is available for the students, who then are occasion-

ally assigned menial tasks to keep them occupied.

The IEP has found no permanent solution for this problem, other than discussing it openly with the companies involved. It is imperative to define expectations at the outset and then wise to establish a periodic review and on-site visit. Unfortunately, the IEP is not funded to the extent that a staff member can be assigned to the task of internship placement and review. Currently, all placements are coordinated by the IEP Director, whose duties are manifold and who essentially does not have release time. The IEP organizers would certainly recommend that any institution interested in setting up an internship program be aware of the time and effort involved, and be prepared to provide release time as needed.[4]

Coordination of the format of the internship is equally important for the position abroad, and yet simplified by the fact that European companies expect to participate in the education of students. Indeed, larger firms have specially staffed training centers and even dormitories for students in the professional fields. They find it to be in their interest to provide practical training and, in most cases, are prepared to take the time to use the students to everyone's advantage. Here again, however, personal contacts with the persons in charge are necessary and on-site visits are needed at least once a year. The IEP has been able to cultivate contacts with firms in Germany through the generosity of FIPSE funding. Any institution planning such a venture would need to seek such funding aggressively from the outside or to budget ample travel monies for its organizers from within the university.

The IEP students are matched according to subject area to the firms with which we work, i.e., mechanical, computer, electrical, civil, industrial, and chemical engineering. Within these subject areas we are likewise able to make more detailed matches. For example, if a student has a special interest in automotive design, we are able to accommodate that. Also, students with aviation interests are sent either to the Lufthansa renovation headquarters in Hamburg, or to a manufacturer involved with the industry such as a jet engine producer. We currently have a civil engineering student with a specialization in environmental problems working with the water purification experts in one of the world's largest chemical companies.

Remuneration and Housing

When we were just beginning with the IEP and first contacting firms abroad, we had little sense of what companies might be willing to pay for internships, and whether a standard might be set before approaching new companies. Experience has taught us that a stipend typical for German students is often not enough to provide the IEP students with a decent subsistence. We thus asked the companies to provide remuneration, whether in the form of direct payment and/or non-cash benefits such as meals and housing, at a level which would enable the students to meet their monthly obligations for room, board, and spending money. The average to date is approximately 1500 DM per month, with some additional assistance for room. Students are also welcome, according to German tradition, to have the main meal of the day in the company canteen at a very modest price. The IEP students are expected to make and pay their own travel arrangements, a cost which is easily offset by the fact that they pay no URI tuition during the semester abroad.

Housing has varied in each case so far. The larger companies such as Siemens and Hoechst in Germany have their own dormitories available for visitors, apprentices, and student interns. Other companies have provided rooms in the vicinity of the company, and some have offered a family stay with members of the firm. There have also been cases where students have been given a subsidy and expected to find their own housing through the normal channels, an experience which can be somewhat humbling for the normally overprotected American student.

Credit

The University of Rhode Island does not have a cooperative education program and thus does not routinely offer academic credit for internship experiences. The IEP, however, has decided to grant six German language credits to its students based upon significant progress in overall proficiency during the six-month stay in Germany. Evaluation of the bi-weekly journals written in German and a post-internship oral exam are the measures to determine if credit is appropriate. The credits are posted to the transcript without grades but nevertheless apply toward the thirty credits required for the German major.

How Are Students Selected?

The International Engineering Program is first and foremost self-selective in nature. Students choosing this option agree to an extra year of undergraduate study, the rigors of learning a

foreign language and meeting all requirements for the Bachelor of Arts degree in addition to the demands of an engineering program. By definition, therefore, the program attracts only students who are reasonably gifted and highly motivated. Although larger numbers declare an interest in the IEP at the freshman level, experience has shown that only approximately one-third of these students remain with the program to its conclusion.

Of the students who demonstrate a willingness and eagerness to stay with the IEP, the following expectations are made for internship placement: 1) All interns must have the equivalent of at least three complete years of engineering and college-level German language studies. The companies in Germany require that the students have sufficient professional preparation to be able to work in actual engineering contexts. The companies also expect the students to be able to converse at fundamental levels in German. All parties know that the students are there to further their language skills. Thus, the ability and willingness to converse in the company at a survival level are requirements of the program. 2) Although the program acknowledges that high grades do not always assure success in future professions, we do expect students to have a respectable gradepoint average (generally 2.8 or better) and to have demonstrated strong intellectual potential. 3) It is also expected that the students will have demonstrated through their three years of academic pursuit a willingness to accept challenge, an ability to adapt to the unexpected, and a strength in interpersonal communication. The program leaders are well aware that even the most brilliant student will not succeed abroad if he or she does not possess the flexibility to live and work in different environs.

Is Everybody Happy?

With our first eight students having been in Germany in 1990 and six more on-site in the first half of 1991, we take pride in many things. The students involved have "survived" three years of German language and culture classes along with their engineering studies, the program has made the necessary contacts, visas have been procured, the journies have been made across the ocean, and each person has either survived or is surviving his or her international internship experience, for better or for worse. What is learned through such a process? Do they really master German? Have they acquired a sense of the culture? Have they acquired a sense of their field as it is practiced abroad?

We in the profession know that these questions speak to qualities or bodies of knowledge which are never mastered to completion, and that any answer must be unsatisfactory. Nevertheless, we seek constant feedback from both employers and students with hopes of refining the process over the years. The IEP interns in Germany are expected to send a journal entry written in German at least every two weeks. In that way we have a continual sense of how the students are fairing, what they are learning, what problems they are facing, with whom they are falling in love, and whether their German language skills are improving. It has been extremely rewarding for our staff to follow the students' progress. It is not all rosy: there has been a housing problem, at least one of the students is underworked, a wallet with a month's salary was lost, and so on. Nevertheless, my colleagues and I are able to glean from these reports, both literally and between the lines, that the internship is an extremely valuable experience, replete with learning experiences at many levels, which will benefit these students throughout their lives and help to make them key players in the global marketplace of the next 30-40 years.

Plans for the Future

The organizers of the Rhode Island International Engineering Program are pleased with its progress and growth and hope that it will serve as a model of content-based language instruction and interdisciplinary programming between a department of languages and a college of engineering. To that end, the IEP has pledged to work with other institutions throughout the country wishing to internationalize their professional school curricula. In the immediate future, such collaboration will be twofold: 1) URI's German Summer School of the Atlantic, an immersion program open to students from all universities, now offers specialized technical German courses for engineering students. 2) URI is also forming a national placement center for international engineering internships. Since the University of Rhode Island now enjoys a surplus of contacts with engineering firms in Germany, it has begun to place students from other universities who meet the same standards of the Rhode Island program.[5] The IEP hopes in this way to meet both the needs of the companies and of other institutions beginning to work toward the com-

mon goal of educating American students for the workplace of the 2000's.

Notes

[1]A version of this paper was presented at the Conference on Foreign Languages for the Professions, sponsored by Eastern Michigan University, May 1990.

[2]FIPSE is the acronym for the Fund for the Improvement of Post Secondary Education.

[3]For a more detailed overview of the entire IEP and its evolution, see: John M. Grandin, "German and Engineering: An Overdue Alliance," *Unterrichtspraxis* 22 (1989): 146-52. Also: John M. Grandin, "Deutsch für Ingenieure: Das Rhode Island Programm," in *Jahrbuch Deutsch als Fremdsprache*, edited by Alois Wierlacher, 15 (1989): 297-306. For a report of the program's development in its second and third year phases, see: John M. Grandin, a report to the editor in the *Leserforum, Unterrichtspraxis* 23 (1990): 104-05.

[4]The first essential ingredient for taking on such a project is commitment to the importance of the concept; the second is a good working relationship with the cooperating professional school. Over and above personal ideals and good will, however, the organizing faculty member should be released from at least one course per semester. Other essentials are some secretarial assistance, a fax machine (an absolute must), and appropriate travel monies

[5]For the period January-June 1991, a mechanical engineering student from the University of Illinois and an industrial engineering student from Rutgers University are enjoying their placements through the IEP with companies in Bonn and Munich.