An International Collaboration Using Technical English

Kevin Taylor and Emília Mironovová

Purdue University - Kokomo / Slovak University of Technology - Trnava

Abstract

As we continue to merge global markets it is inevitable that many of today's graduates will participate in international activities when they enter the workforce. It is imperative that we prepare our students for this global work environment. Described is a project between students in the United States and the Slovak Republic aimed at improving both technical communications and cultural understanding between the two groups. The students in the United States were seniors in a two-semester capstone design sequence in Electrical Engineering Technology (EET) at Purdue University. The Slovak students were Ph.D. candidates from the Faculty of Materials Science (MtF) at the Slovak University of Technology (SUT). Their studies included Material Science, Plant Management, Automation and Control, and Machine Technologies. The MtF students were enrolled in a course entitled "English for Specific Purposes", allowing all communications to be in English. Both groups reviewed technical English written by peers including flaws and idiomatic expressions. The primary advantage of this collaboration is that it is not constrained by curricular discipline, making it easily adaptable by other disciplines. A secondary advantage is that the students gain international experience while avoiding the travel expense.

Introduction

It is paramount for today's student's success in the global marketplace that they have some international experience. Unfortunately, most students lack the financial means to have such an experience outside the classroom. Jones and Oberst describe activities to internationalize curricula in their keynote paper at the 3rd UCIEE Annual Conference on Engineering Education. They state that they "see too little movement toward better preparing college graduates for the international challenge."[1] They highlight some successful programs for study abroad, finding the programs "quite expensive, again limiting the number of engineering students who can or will participate."[1] Efforts using distance-learning techniques in international collaborations are not new. Hager et al. describe a project where students at Penn State University (U.S.) team with the Universite d' Artrois (France). Their project used expensive ISDN communication between the groups, but state that using the conferencing capability of the Internet "would reduce cost sharply, since there would be no ISDN line costs."[2] Lacking access to an ISDN line, we have chosen to use e-mail and Internet cameras for our project. While similar in method to the U.S.-France project, our approach is unique in that it is independent of the participant's area of study, making it easily adaptable by other institutions.

Participants

Both collaborators on this project are part of large universities, but reside on smaller, remotely located campuses. Purdue University - School of Technology at Kokomo (PUK) is located 48 miles (80km) from the larger West Lafayette, Indiana campus. The Slovak University of Technology - Faculty of Materials Science and Technology (MtF) is located in Trnava, approximately 30 miles (50km) from its parent campus in Bratislava. PUK shares resources with Indiana University Kokomo, a non-residential, regional campus of Indiana University. Both PUK and MtF campuses have student populations of approximately 3000. One advantage of attending a large university campus is the diversity in population and richness in international cultural exposure. Unfortunately, students at smaller campuses such as ours are denied that luxury.

The PUK students are enrolled in a yearlong, capstone design course in the Department of Electrical Engineering Technology (EET). In this course, each student must choose and develop a working design prototype of a system. After building and testing their prototype, they demonstrate their system and present their findings to the faculty through oral and written reports. Homkes and Vega Riveros state in their paper describing their project between PUK and Javeriana University students that "extension campus students are generally older and less affluent than those on the main campus and thus less likely to have international experience. Many graduates of this Purdue campus, however, immediately go to work for Daimler-Chrysler or Delphi Delco Electronics, both international corporations that have expanded their international scope through mergers." [3] Many of the EET graduates have never traveled outside of North America, so it is imperative that they develop the skills necessary to survive in global corporations. This point was emphasized in the mid-1990's when the CEO of Delco Electronics, challenged the PUK faculty to internationalize the curricula.

The MtF students involved the project are Ph.D. candidates specializing in diverse topics within the Faculty of Material Science, including Material Science, Plant Management, Automation and Control, and Machine Technologies. It is required that all MtF Ph.D. candidates have a proficiency in a foreign language before completion of their studies. Many advisors are specifying English as the language to be studied. Those participating in the project are enrolled in a course entitled "English for Specific Purposes" (ESP). In the ESP course, they are required to understand written and spoken English. Exercises include translating technical texts, describing a product, process or company, writing a technical report, and designing and presenting a scientific poster. In view of their technical endeavors, they, like their U.S. counterparts, could also benefit by from international and cultural exchanges.

Goals

One goal of this project was to provide both EET and MtF students with an international experience while avoiding the expenses and time required for travel. A second goal was to improve both groups' ability to communicate using technical English. In his text on writing to the scientific community, Day exemplifies this goal stating that clear certain meaning should apply to not just the peers of the author, but also to students just embarking on their careers, to scientists reading outside their own narrow discipline, and especially to those readers (the majority of readers today) whose native language is other than English."[4]

Pilot Project

The pilot project was started with six EET students and eight MtF students. During the second semester, two additional EET students joined the cohort. Most of the exchanges between the two groups used e-mail. We asked the students to exchange resumes and autobiographies to bring a familial component into the project and develop bonds between the participants. The EET students sent descriptions of their design projects to the MtF students. The MtF students sent abstracts describing their research to the EET students. Internet cameras were used to have a conference between the two groups. The MtF students' poster presentations were sent to Kokomo and displayed, and videotapes of the EET students' final design demonstrations were sent to Trnava. While these initial achievements were modest, we learned from that initial experience and continued developing the collaboration.

The initial project developed much more slowly than we had hoped. Forming our partnership after the start of the fall semester made planning and implementation difficult. The authors had not clarified their goals or agreed upon a timetable for completion of the assignments. Failure to pair the participants made the volume of material exchanged overwhelming. Student participation was limited since it was not clear how it would be incorporated into the course grade. In addition, some technical challenges needed to be overcome. Initially, the format of documents attached to e-mail was not compatible. Unfamiliarity with the computer hardware available made the choice of the Internet cameras challenging. Finally, the lapse between questions and responses because of time differences slowed progress and made communication between the groups difficult. This was compounded by occasional misunderstandings due to language.

2000-2001 Project

A Global Initiative Faculty Grant (GIFG) from Purdue University provided $2500 US in seed funds to support the project for the 2000 calendar year. As mentioned previously, Internet cameras were purchased to facilitate the Internet conferences. Dr. Mironovová visited PUK in the summer of 2000 allowing us to better plan the activities of the second phase of the collaboration. Being aware of and having overcome of some of our initial challenges, we are now mid-way through this second phase. The project timetable is shown in Table 1.
During this second project phase, student pairs were formed early during the first semester. These pairs exchanged autobiographies and shortly thereafter, a group conference was held using the Internet cameras. Using money from the GIFG, we were able to have a student exchange. One student from each university visited the other location for approximately one week during the fall semester. This stirred more interest in the project from both groups. Through a meeting with faculty with the Purdue West Lafayette campus, the MtF student who visited the U.S. is considering further studies at Purdue. The PUK student who traveled to Slovakia returned with many interesting tales about his trip, including his leading of two of the English classes. These activities we hope will form closer bonds between the individuals and instill a feeling of ownership by the participants in the collaboration.

Table 1 – 2000-2001 Project Timetable

Activity	Completion Date
Pairing students, exchanging e-mail addresses, exchanging autobiographies	10 September
Group Internet conference to meet partners	15 September
EET students submit design proposal to their MtF partner	20 September
MtF students provide feedback and questions about EET design proposals	1 October
MtF students submit an abstract of research work to their EET partner	20 October
EET students provide feedback and questions about MtF students' abstract	1 November
Student exchange	November
Students exchange resumes (CVs)	20 January
Students provide feedback and questions about resumes, Internet interviews	1 February
MtF students submit posters for mailing to Kokomo	15 February
EET students provide feedback and questions about MtF students' poster	15 March
EET design presentation videotapes mailed to Trnava	15 April
Final group Internet conference, issuing certificates, evaluation of project	30 April

Since the two groups have different technical backgrounds, they may omit concepts not understood by those outside their technical field. Throughout the year, the pairs will be critiquing each other's work for both clarity of technical content and grammar. During the fall semester, the EET students have sent their design proposals to the MtF students. The goal here was to create an international brainstorming exercise allowing the EET students to view their project from a non-U.S. perspective. The MtF students then shared abstracts of their research with the EET students. This allowed the MtF students an opportunity to have their technical writing evaluated by a peer and to possibly gain some insight from their partner.

In the spring semester of the second phase of the project, the student pairs will exchange resumes and possibly interview each other using the Internet cameras. This will facilitate conversational practice for the MtF students, and will allow both groups to practice their interviewing skills. The MtF students will mail copies of posters used to showcase their research to Kokomo. Like those from the first cohort, these will be prominently displayed on campus and critiqued by the EET students. In April, the EET students' finished design presentations will be videotaped and mailed to Trnava. At the end of the academic year, a final Internet conference will be held. Certificates will be awarded at this conference and participants will evaluate the collaboration.

Outcomes

At this writing, the second phase of the collaboration is still in progress and assessment of the project is anecdotal. As mentioned earlier, we will survey the participants at the end of the project to determine if it is indeed effective. One goal was to provide an international experience while avoiding the expenses and time required for travel. While this was achieved using limited travel, we believe that that more involvement is necessary. A second goal was to improve both oral and written communication in English. By their involvement in the project, the MtF students are reading, writing and speaking English with native speakers. The EET students have become

sensitized to their use of idiomatic phrases and, at least when communicating with the MtF students, are learning to communicate clearly. By sharing their design and research ideas, we hope that both groups gain a new perspective of their design and research endeavors. Lastly, we have seen some gains in understanding and appreciation of the cultural differences between the two groups.

Conclusions

The international collaborative project described will afford benefits to both groups involved. It creates a pathway to improve the communication skills of both the U.S. and Slovak students. Participation in the project has sensitized the EET students to the problems created using idiomatic phrases and encouraged them to present their ideas more clearly. The MtF students are reviewing technical English written by their peers including flaws. In addition, the written materials and Internet meetings shared with the EET students serve as practice exercises in English. It is hoped that the EET students will acquire more global visions of their projects, resulting in the incorporation of new ideas into their designs. The MtF students may also gain a different perspective on their research. We hope that these activities foster a greater interest in global politics and history by the participants, and thus better prepare them for the global work environment.

One advantage of this collaboration should not be overlooked. That is the fact that it can be incorporated into almost any curricula where a common language can be used. The students need not be of the same disciplines; in fact, having them be of different disciplines requires clarity and may be viewed as an advantage. We believe that this project can serve as a model for collaboration pairing a non-native language class with a technical program using that language.

Acknowledgements

The authors wish to thank the student participants and acknowledge the support of Department of International Programs at Purdue University who provided support through the Global Initiative Faculty Grant (GIFG).

References

1. Jones, R. C., & Oberst, B. S., International experience for engineering students through distance learning techniques. *3rd UICEE Annual Conference on Engineering Education.* Hobart, Tasmania, 63-66 (2000).
2. Hager, W., Devon, R., Lesenne, J., & Daintive, D., A French -American collaboration in engineering and technology education. *1998 ASEE Annual Conference Proceedings.* Seattle, WA, USA [CD-ROM: \proceed\00235.pdf-11pages] (1998).
3. Homkes, R., & Vega Riveros, J. F., Mirroring industry through international student projects. *2nd Asia-Pacific Forum on Engineering & Technology Education.* Sydney, Australia, 33-36 (1999).
4. Day, R. A., *How to Write & Publish a Scientific Paper.* Phoenix, Arizona: The Oryx Press, 2 (1994).

KEVIN TAYLOR
Kevin Taylor is an Associate Professor of Electrical Engineering Technology at Purdue - Kokomo. He received his BSEE from Iowa State University and his MSEE from Southern Methodist University. Prior to his academic career, he was an integrated circuit designer at Texas Instruments, Inc. Kevin is currently the SAE representative on the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

EMÍLIA MIRONOVOVÁ
Emília Mironovová graduated from the Faculty of Arts, Comenius University with the degree in Russian and English Language and Literature. Since 1986 she has taught English for Specific Purposes (ESP) at the Faculty of Materials Science and Technology, Slovak University of Technology. She has participated in the British Council/Slovakia/ESP projects and as a teacher-trainer has lead several ESP courses in Slovakia and abroad.