USING TECHNICAL ENGLISH IN AN INTERNATIONAL COLLABORATION

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Abstract *– Described is a project aimed at improving technical communications and cultural understanding. Participating were Ph.D. candidates from the Faculty of Materials (MtF) Science at the Slovak University of Technology studying Material Science, Plant Management, Automation and Control, and Machine Technologies, and senior-level baccalaureate students in a two-semester capstone design sequence in Electrical Engineering Technology at Purdue University in the United States. The MtF students were enrolled in a course entitled "English for Specific Purposes", allowing all communications to be in English. Student pairs exchanged resumes, biographies, and technical works. Internet cameras facilitated online meetings throughout the yearlong project. Because of the different disciplines of the participants, clear English communications was required and both groups benefited by reading, writing and speaking through correspondence and online meetings. One advantage of this collaboration is that the students gain international experience without the expense of travel. A secondary advantage of the project is that it is not constrained by curricular discipline.*

Index Terms – Collaboration, English for Specific Purposes, International, University

INTRODUCTION

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 therefore imperative that we prepare our students for this global work environment. Unfortunately, most students lack the financial means to travel or study abroad. Jones and Oberst [1] "see too little movement toward better preparing college graduates for the international challenge." They highlight successful programs for study abroad, but find the programs "quite expensive, again limiting the number of engineering students who can or will participate." Use of distance-learning techniques in international collaborations are not new. Hager et al. [2] describe a project where Penn State University (U.S.) students team with the Universite d' Artrois (France). Their project used expensive ISDN communication, but suggest that using Internet conferencing capability "would reduce cost sharply, since there would be no ISDN line costs." Lacking access to an ISDN line, we 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.

PROJECT PARTICIPANTS

Both teams on this collaboration are part of larger universities, but reside on small, remotely located campuses. Purdue University - School of Technology at Kokomo (PUK) is located 80km from its parent West Lafayette, Indiana campus. The Slovak University of Technology - Faculty of Materials Science and Technology (MtF) is located in Trnava, approximately 50km from its main 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 afforded students attending a large university campus is the richness in international cultural exposure and diversity in population. Unfortunately, students at smaller campuses like ours are denied that experience.

The PUK students are enrolled in a yearlong, capstone design course in the Department of Electrical Engineering Technology (EET). Each student must choose and develop a working design prototype of a system. After building and testing their prototype, they demonstrate their system and submit their findings to the faculty through oral and written reports. Homkes and Vega Riveros [3] state in their paper describing their project between PUK and Javeriana University 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." Many of the EET graduates have never visited outside of North America. It is important that they develop the skills necessary to compete in global corporations.

The MtF participants are Ph.D. candidates specializing in various topics within the Faculty of Material Science. These include Material Science, Plant Management, Automation and Control, and Machine Technologies. It is required that all Ph.D. candidates at MtF have a proficiency in a foreign language before completion of their studies.

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Many advisors specify that English be chosen as the language that is studied. Those participating in the project are enrolled in a course entitled "English for Specific Purposes" (ESP). Upon completion of the ESP course, they are expected 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. As large corporations move into eastern and central Europe, the MtF participants, like their U.S. counterparts, will also need international and cultural experience.

OBJECTIVES

One goal of this project was to provide our students with an international experience while avoiding the expenses and time required for travel. Another goal was to improve both groups' ability to communicate using technical English. Day [4], in his text on scientific writing, exemplifies this goal: "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." Since our cohorts come from different technical backgrounds, this we feel that they will benefit by explaining their research and projects to persons outside their discipline.

1999-2000 PILOT PROJECT

In the fall of 1999, our 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 purchased with funds from a grant 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 anticipated. By forming our partnership late in the fall semester, planning and implementation were difficult. We had not clarified our own 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 unclear how it would be incorporated into the course evaluation. 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 difficult. Finally, the challenges of working over multiple time zones slowed our communication. This was compounded by occasional confusion due to misinterpretation.

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 made several advances in this second phase. The project timetable is shown in Table I.

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. In fact, 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 class sessions. These activities helped to form closer bonds between the individuals and instill a feeling of ownership by the participants.

In the spring semester of the 2000-2001 project, the student pairs exchanged resumes and had brief interviews using the Internet cameras. This facilitated conversational practice for the MtF students, and allowed both groups to practice their communication skills. A PolyComm Internet conference system became available at PUK allowing for better quality transmission of audio and video. In April, three of the EET students' finished design presentations broadcast to Slovakia using this technology. At the end of the academic year, a final Internet conference was held. Certificates of participation were awarded and participants evaluated the collaboration. We plan to obtain posters of the MtF students' research from this cohort to display at PUK.

TABLE I

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)	15 February
Students provide feedback and questions about resumes, Internet interviews	15 March
EET design presentation broadcast to MtF using PolyComm conferencing system	15 April
Final group Internet conference, issuing certificates, evaluation of project	30 April

OUTCOMES

Much of our assessment of the project is anecdotal and the long-term benefits will be difficult to benchmark. 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 would be beneficial.

We have seen some gains in understanding and appreciation of the cultural differences between the two groups. This is evident in comments solicited from the participants at the end of the project. Some of these included:

- "It was a great opportunity to improve not only written English, but also improve listening and speaking during net meetings, which were organized regularly during the academic year. It helped me to understand better technical reports and papers published worldwide which are necessary for my professional growth. As one of the first participant in this project, I was awarded a short-term stay at the Department of EET of Purdue University in Kokomo. My visit was realized with financial support of the language and cultural exchange project. My visit was two weeks long and I found great improvements of my English colloquial language as well as technical one. …. I would like to highlight the great importance of this project for young Ph.D. students as a natural and delightful means for increasing English language performance and a nice possibility to meet new friends." (MtF participant, Martin Kusý, who participated in a brief exchange)
- "I improved my language abilities and translated my paper. The most interesting was communicating via netmeeting. My partner gave me feedback by email and when we spoke via netmeeting. It was nice to meet with interesting people with different culture." (MtF participant, Marek Simon, who provided technical support on the internet meetings)
- "I have found it interesting to meet with the Slovak class. It seems that I hadn't really thought about what educational requirements were like in other countries. It was also interesting to see how the CV is different from our resume. I also thought that it was nice to let them view our presentations live over the Internet and for us to see and hear about their projects." (Purdue participant, Todd Smith)

Our second goal was to improve the participants' oral and written communication in English. The EET students have become sensitized to their use of idiomatic phrases and, at least when communicating with the MtF students, are learning to express their thought more clearly. Through their involvement, the MtF participants have demonstrated improvement in their English skills. Slovak coauthor and ESP language instructor, Emília Mironovová shared these comments in our assessment:

- "Our common classes are just a simulation of business communication, but with this project it was real. They appreciated your feedback much more than mine and were highly motivated."
- "They were proud to be in the project; it was a great promotion for the departments. They valued their Certificates of Participation and displayed them in their offices. I received very positive comments from the Head of Materials Engineering."
- "I saw more intensive communication on the preparation for the ESP exam and posters within the project participants. They felt more responsibility knowing that their posters would be displayed in Kokomo. There output is impressive compared to non-participants."
- "This is definitely raising the visibility of our Language Department. I don't know any other department at a university in Slovakia with this type of cooperation."

FUTURE PLANS

We are currently pursing funding to obtain a second PolyComm Internet conferencing system to be used at MtF to allow clearer transmission of the audio and video. We are also considering participation by undergraduate MtF students. Finally, through our respective contacts, we hope to facilitate formation of similar collaborations between U.S. institutions with capstone design courses and other institutions offering ESP courses.

CONCLUSIONS

The international collaborative project described has benefits to all involved. It creates a method for improving 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 has helped them present their ideas more clearly. The MtF students are experiencing technical English written by their peers and showing greater interest in the ESP course. In addition, the written materials and Internet meetings shared with the EET students serve as practical exercises in English communication. We believe that these activities foster a greater interest in global politics, culture and history by the participants, and thus better prepare them for the global work environment.

One advantage of this collaboration should not be overlooked; it can be incorporated into nearly 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 forces them to be clear in their communication. We believe that this project may serve as a model for collaboration pairing a non-native technical language class with a native speaking technical program.

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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, 2000, 63-66.

[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, 1998 [CD-ROM: \proceed\00235.pdf-11pages].

[3] Homkes, R., & Vega Riveros, J. F., Mirroring industry through international student projects. *2nd Asia-Pacific Forum on Engineering & Technology Education.* Sydney, Australia, 1999, 33-36.

[4] Day, R. A., *How to Write & Publish a Scientific Paper*. Phoenix, Arizona: The Oryx Press, 1994, 2.