

A Case Study on the Planning, Formulating and Offering of a Computer Graphics Curriculum Abroad.

*D. C. Acheson, M.W. Bannatyne – PhD.
Computer Graphics Technology (CGT)
Department of Mechanical Engineering Technology
Purdue School of Engineering and Technology – IUPUI, Indianapolis, IN 46202-5160*

ABSTRACT- *As the world continues to move towards a global economy, it is imperative that we as educators expand our influence and prepare students to function within this realm. To this end, educators at Purdue University’s West Lafayette and Indianapolis campuses have been laying the groundwork by offering graphics instruction in countries such as Poland and Russia. This paper outlines the strategies and procedures in establishing collaborative endeavors between academia in the United States and the country of Poland (specifically) for graphics instruction. Additionally, cultural, social, interpersonal and second language issues encountered while in that country are addressed within this paper.*

I. INTRODUCTION

North America has witnessed the departure of a large amount of product design, manufacturing and soon-to-be printing services to countries such as China. This trend will no doubt continue as previous technological boundaries crumble and next-age information systems make the world a smaller place with each passing day. As a response to this outsourcing trend, the skills and experiences of our students should be examined and modified in order for them to remain competitive both at home and abroad. Providing opportunities for students that transcend geographical boundaries helps prepare them for a successful transition to this new “global workplace”. At the same time, new free-market economies in places such as Russia and Poland offer

tremendous opportunities to expand American academic programs in order to cater to this enlarged “global village” of constituents requiring advanced education. In the field of applied computer graphics, there are currently no comprehensive academic programs offered in those countries (Russia and Poland) that deliver instruction utilizing a breadth of industry-standard software packages. The tools are available (hardware and software), but structured, recognized educational opportunities are not. Further, these countries are experiencing a newfound freedom of the entrepreneurial spirit which has made them *very* hungry to learn.

In 2005, the authors, an additional faculty member and eleven undergraduate students spent a month delivering graphics instruction in Poland. The experience for all (American and Polish administrators, faculty and students) proved to be so positive and enlightening that the authors encourage other educational institutions to embark on similar endeavors.

As the title of this paper implies, the planning and formulating of this academic exchange is thoroughly outlined in order that other educators may replicate this type of program. Specifically, the first portion of this paper is *based on the proposal* that was drafted to make this cross-cultural opportunity a reality. Modified from future tense to past tense, the following text could easily be re-edited to serve as a template for compiling your own customized educational exchange proposal. (Note: abbreviations, acronyms and EDGD paper submission standards have been applied to conserve space for this

publication. Normal page layout, proposal guidelines and aesthetic considerations should be followed to ultimately win favor of your specific institution's proposal reviewers.)

If applied, these multi-national collaborative efforts could redefine the way engineering technology students (including computer graphics majors) are being prepared to enter the workforce – the new global workforce.

II. STUDY ABROAD PROGRAM PROPOSAL

The Department of Mechanical Engineering Technology
Computer Graphics Technology Program
Purdue School of Engineering and Technology
Indiana University Purdue University Indianapolis
(IUPUI)

Computer Graphics Post-Secondary Technical Teaching Experience in Poland

in cooperation with

The University of Information Technology and
Management
Rzeszow, Poland
and

The University of Communications and Management
Poznan, Poland

Submitted: (Date of this proposal was included here)

Program Summary

This overseas program provided students with an opportunity to participate in a post-secondary technical teaching experience that lasted a period of 31 days. This program was arranged with the cooperation of The University of Information Technology and Management in Rzeszow, Poland, and The University of Communications and Management in Poznan, Poland. This program stemmed from student workshops and faculty development seminars that began in 2003 under the direction of Dr. Mark W. McK. Bannatyne who was then assigned to the Dept. of Computer Graphics Technology at Purdue University's W. Laf. campus.

IUPUI students earned three degree credits for the work they performed as laboratory tutors and the delivery of technical demonstrations and lectures with

CGT faculty members. The internship was supervised by faculty members from the MET Department at IUPUI who were on-site in Poland for the entire program. Students were required to attend a series of 5 preparation seminars at IUPUI prior to their departure for Poland, as well as attend daily planning sessions that were held in Poland. Formal examinations, papers or projects due from students were not used to determine the final grade of the participants. Final grades were accessed based on records kept on the daily execution of their duties.

International Study Abroad Programs

The Dept. of Mechanical Engineering Technology (MET) is endeavoring to establish Study Abroad programs with international partners as an option available to students who enroll in degree programs within the School of Engineering and Technology. This program was our initial step to offer qualified students an opportunity to complete a post-secondary teaching experience in Poland. This program was planned by Dr. Bannatyne as a result of previous visits and workshops he organized at both host universities in 2003 and 2004. A formal relationship between IUPUI and the University of Information Technology and Management in Rzeszow, Poland was prepared that parallels the agreement which Dr. Bannatyne supervised for the W. Lafayette campus of Purdue University.

Configuration of the Program with Host Universities in Poland

The MET program in Computer Graphics Technology in cooperation with both the University of Information Technology and Management (Rzeszow, Poland), and the University of Communications and Management (Poznan, Poland) is establishing an ongoing Study Abroad program in Poland that provides an opportunity to enhance common academic interests and laboratory activities. Students who participated in this program were required to:

1. Submit a formal resume of their qualifications.
2. Participate in an interview where they are asked to explain in detail:
 - a. Why they believe their participation would be of value to their studies and future career.
 - b. Respond to questions that deal with the technical aspects of their field.
 - c. Present a digital portfolio of their work in computer graphics.

Students who were recommended for participation registered at IUPUI for 3 credits of CGT I496 during the first summer semester of 2005 (NOTE: Participants did not earn course credits from either host university in Poland). Faculty members from the MET Dept. in the School of Engineering and Technology were responsible for supervising all aspects of this program while at IUPUI and in Poland. MET faculty members were responsible for assigning students to their teaching and tutoring responsibilities, oversaw the student work schedules in Poland, reviewed the teaching responsibilities performed by each student on a daily basis and were responsible for the assignment of the final grades issued to each participant.

In 2003, all student seminars and faculty development workshops conducted in Poland at the host institutions cited were directed by Purdue University faculty. In 2004, the seminars and workshops held were supervised by Dr. Bannatyne and Associate Professor John Finnegan (IUSB campus) and supported by the work of 8 students (7 undergraduate, 1 graduate). In 2005, under the direction of Dr. Bannatyne, Associate Professor Doug Acheson and Lecturer of CGT Adam Siurek supervised 11 students (all undergraduate). Students were assigned to support the lectures given by faculty by preparing visual and digital teaching materials, acted as laboratory tutors to both students and Polish faculty members, provided technical support through the presentation of demonstrations and acted in a team-teaching capacity with Purdue University faculty members in the delivery of certain lecture topics.

Students selected to participate in this program did not receive a stipend from either of the host universities in Poland or IUPUI, however their housing was provided by the host universities in each city. A Memo of Understanding (MOU) proposed a reciprocal exchange of students between IUPUI and the University of Information Technology & Management in Rzeszow, Poland. (NOTE: It is hoped that a similar MOU will be arranged with The University of Communications and Management in Poznan, Poland in 2006.)

Overseas Partners

Univ. of Information Technology and Management in Rzeszow (Contact information was listed here)

University of Communications and Management (Contact information was listed here)

Sponsoring Academic Units at IUPUI

Dept. of Mechanical Engineering Technology (Dept. and school contact information was listed here)

Dates of Program and Frequency

Program was scheduled May 19 – June 20, 2005.

Number of Participants

Students: 11 (all undergraduate)

Faculty: 3 (Dept. Chair, Assoc. Prof., Cont. Lecturer)

Rationale

Study Abroad opportunities, whether in the form of courses, workshops or internships, have long been valued by the Purdue School of Engineering and Technology. Such opportunities provide students with authentic settings in which to apply the knowledge and skills they have gained from classrooms and laboratory activities. Traveling to other nations and being able to interact with colleagues and peers in diverse cultural settings adds an impressive dimension and qualification to the resumes of both continuing students and new graduates alike. Students who have been successful in foreign study programs often receive letters of recommendation that strengthen their career portfolios,

allow them to exhibit a larger awareness of the world in which we live and expound on their own unique experiences during job interviews. In many cases, Study Abroad opportunities have led students to excellent job offers due to the enlightening influences that have come into their lives through participation in such programs.

Engineers and technologists who will graduate in the early part of the 21st Century will enter a global job market, despite the fact that they may only seek employment in their home state. Indeed, most of the graduates from our department will work for multinational companies and will be required to interact with peers from diverse nations on a regular basis. The prospect of gaining international experience through the cultural interaction such a program offers makes this opportunity invaluable to each and every engineering and technology student enrolled in it. Both the University of Information Technology and Management and the University of Communications and Management are excellent partners for this program. The language of instruction in their computer graphics courses is English. While the US students are encouraged to learn greetings and polite phrases in the local language, foreign language proficiency is not required.

Students who wish to meet the challenge of learning about life in the technologically emerging world of Eastern Europe would do well to choose Poland as their destination. Poland possesses the cultural heritage of eastern architecture and civic customs while embracing the living standards and attitudes of the west. Historically, Poland has always had good relations with the U.S. and over the last two years has welcomed the efforts made by our university to assist in its attempts to raise their level of technological literacy. With a secular democracy and a free market economy, Poland is poised to assume its place in the European Union in 2007 and contribute to its role in international affairs.

Rich in history and culture, Poland offers tremendous opportunities for American students willing to seek deeper understanding of life in a country at peace with its unique approach to modernity and evolving social structure. A Study Abroad program with these host universities can be a life-changing experience for students who are ready to accept the challenge of immersion into a unique way of life.

Eligibility

Eligible students are those in good academic standing with a CGPA of 2.75 or higher who have completed at least the 1st year of the CGT program. Formal approval was granted by the Selection Committee of the MET Dept. after a portfolio review and personal interview.

Pre-Departure Orientation and On-site Meetings

Students accepted to participate were required to attend 5 orientation seminars prior to their departure for Poland. These seminars were conducted by the Chair of the MET Department (Dr. Bannatyne) and the faculty members assigned to supervise the program in Poland. Seminars were used to discuss:

1. Details and responsibilities of the teaching program.
2. Conduct policies.
3. Travel arrangements.
4. Cultural aspects of the host nation.
5. Emergency procedures due to medical or political concerns created due to changing world situations.
6. Contact information that included telephone and fax numbers associated with housing and the nearest US embassy or consulate.

A pre-departure orientation session in cooperation with the IUPUI Office of International Affairs was also conducted in order to ensure their office could address other issues deemed appropriate.

Academic Program Overseas

At the conclusion of this program, all students were asked to complete a survey addressing how the program was organized, accommodation standards, material

support of their duties, etc. as part of the evaluation process for this program. Note: This survey was not used in determining the student's final grade. The student's final grade was determined based on data collected on a daily basis in regards to the performance of their duties. However, completion of the survey was a requirement. After the students completed and submitted the survey, the IUPUI faculty supervisor assigned their final grade as either Pass or Fail.

Support Services Overseas

Both universities agreed to assist students with housing. A verbal agreement was received from the Univ. of Information Technology and Management in Rzeszow during their visit to IUPUI in October, 2004 that they would finance 100% of the housing costs for each student. The Univ. of Communications and Management in Poznan agreed as well to pay the housing for all students in that city. The MET Dept. guaranteed the full housing costs in the event of any default by either of the hosting universities due to clerical errors, immediate payment demands due to late processing practices, etc. This ensured that the students did not have to deal with any monetary issues that may have inadvertently arisen. In 2003, 2004 and again in 2005, no monetary issues whatsoever occurred with either host institution.

Contact

(Contact information was listed here)

Room and Board

As noted in the section entitled "Support Services Overseas", assistance with housing arrangements was provided by both host universities. Housing provided by UITM was in the Forum Hotel in the central district of Rzeszow. A 3-Star hotel located near the center of the city, close to public transportation stops, food services and entertainment venues. The hotel is a new facility

(opened in 2004) located in a safe and well lit part of the city. Accommodation in Poznan was at the "Ikar", a 3-Star hotel, located near the Stary Rynek ("Old Center") and is close to food outlets, public transportation services and entertainment venues. The Ikar is located in a well lit and very safe part of the city. All students were responsible for paying for their own meals and personal expenses from their own funds.

Expenses for Interns

Fees for which students were responsible included:

1. Fee for 3 credit hours of CGT I496	\$ 552.00
2. International Student Card	22.00
3. IUPUI Health Insurance	24.00
4. Food (@\$20 per day for 29 days estimate)	580.00
5. Trans. to and from US airport (estimate)	100.00
Total	\$1278.00

IUPUI students participating in this program qualified to have credits associated with CGT I496 count toward full-time status for financial aid purposes. (Students could also take out additional loans if they met all eligibility requirements as specified under university regulations and Financial Aid policies.) Students selected to participate received a scholarship from the MET Dept. that covered the cost of the items shown below. There were no fees paid to either host university in Poland.

NOTE: During the 2005 summer session, IUPUI did not charge any additional overseas study fee. The cost of the required IU sponsored health insurance and the International Student Card payable to Indiana University Office of Overseas Study have been noted above.

Costs Paid by MET

1. Airfare from US to Warsaw, Poland	\$900.00
2. Ground transportation while in Poland	100.00
3. Housing costs in Krakow and Warsaw	250.00
4. Housing costs in Warsaw (return home)	<u>100.00</u>
Total	\$1350.00

Costs Paid by Host Universities in Poland

1. Housing in Rzeszow (21 nights @ \$30)	\$630.00
2. Housing in Poznan (5 nights @ \$30)	<u>150.00</u>
Total	\$ 780.00

Program Budget

Program coordination was donated by the Purdue School of Engineering and Technology at IUPUI. There is no resident IU director on site.

Program Administration

This program was coordinated by the Department of Mechanical Engineering Technology. The Chair of the department, Dr. Mark W. McK. Bannatyne, assumed the overall responsibility for the operation and management of this program, and was on-site during its operation. The MET faculty members assigned to participate in this program acted under the authority of Dr. Bannatyne, and were responsible for the daily supervision of the program's student participants as well as assigning the final grades in the program.

Coordination on behalf of the host universities in Poland was directed by Professor Mira Czarnecka on behalf of the University of Information Technology and Management in Rzeszow, and by Dr. Inz. Janusz Kleban on behalf of the University of Information and Management in Poznan.

Submitted by:

(Person submitting this report (Dr. Bannatyne) as well as contact information was included here)

III. POLISH STUDY ABROAD EXPERIENCE

This Polish study abroad program was a phenomenal experience for faculty and students alike. Students who participated from IUPUI reported that the experience was extremely meaningful, rewarding and life-changing. The positive attitudes that these students brought away from this encounter has made an impact on how they are pursuing their education now that they are back in the United States. Appreciation of our way of life,

availability of educational opportunities and a sense of their up-and-coming global competitors were all sited as intangible benefits gleaned from this experience. A realization of the difference, yet commonality of our cultures were engrained in many of our students as they interacted with their Polish counterparts through teaching, conversation and social situations (Fig. 1).



Figure 1. Insightful cultural exchange.

An appreciation of Poland's architecture, culture and history were also sited as one of the most profound learning experiences by our students. A visit to the historically renowned and sobering Nazi concentration camp of Auschwitz as well as taking part in a massive Polish pilgrimage (Fig. 2) were very meaningful events.



Figure 2. Corpus Christi day pilgrimage.

Inside the classroom, our students gained invaluable experience in areas such as public speaking, instructional delivery and real-world problem solving. The opportunity to share their knowledge of computer graphics not only solidified the skills they already possessed, but also exposed them to the real-world scenarios of group dynamics and management. (Fig. 3)



Figure 3. The student becomes the teacher.

A challenge presented at UTIM in Rzeszow was the 100-computer lab configuration. A second projection screen in the back of the room prevented students from seeing instructors and references by pointing methods. Audio projection was also a challenge. This was addressed by using a microphone and speaker configuration, but proved somewhat ineffective as a single speaker location was the only available option - also located in the front of the room. However, sited as a positive learning experience, our students were forced to adapt their delivery methods to a given environment.



Figure 4. Overcrowded lab configuration.

The Project:

Exploiting cultural exchange unique to Indiana, the theme “The Indianapolis 500” was used for the 15-day graphics training in Rzeszow. Reference materials of DVD’s, posters and an Indy car scale model were given.

The requirements of the project are listed below:

Assignment #1 - Animation

30 second animation: “The Indianapolis 500”

A. All animations must include:

1. Opening title of your animation
2. Green flag being dropped signaling start of race
3. One car making a “Pit Stop”
4. “Spin-out”/accident of single or multiple cars
5. Winner crossing finish/checkered flag dropped
6. Winner victory celebration
7. Closing credits which list:
 - a. Software that was used
 - b. Names of all group members
 - c. Credit shown below:

CGT Animation Workshop
University of Information Technology and Management
Rzeszow, Poland
May 23 – June 10, 2005

B. Creation requirements must include:

1. Physical objects:
(Note: At least one 3D model must be made using 3D Studio MAX, at least one made using Rhino and at least one texture created using Adobe PhotoShop)
 - a. Indy 500 race track including outside wall
 - b. Race cars (as many as, but no more than 33)
 - c. Pace Car (preferably this year’s model)
 - d. A green flag and a checkered flag
 - e. Members of the “Pit Crew”
 - f. A trophy for the winner
 - g. Supporting buildings and areas such as:
 - Pit area
 - Garage where the car is stored
 - The Winner’s Circle
2. Sequential animation made in Rhino (Flamingo)
3. Post-production features must include:
 - a. Sound bites added to the animation.
 - b. Final output must be done in 3D Studio MAX and be rendered at 320X240

Assignment #2 - Website

A. All websites must include:

1. A “Splash Page” introducing site to user
2. Link to the official Indianapolis 500 site
3. Stills w/explanation how animation was created
4. Final animation embedded in website
5. At least one Flash component within the site
6. List profiles of each member of the group

The Outcome:

The projects created by the Polish students under the direction of IUPUI students during this intensive three-week graphics program were nothing short of amazing. (Figure 5.) Technical and aesthetic skills are evident.

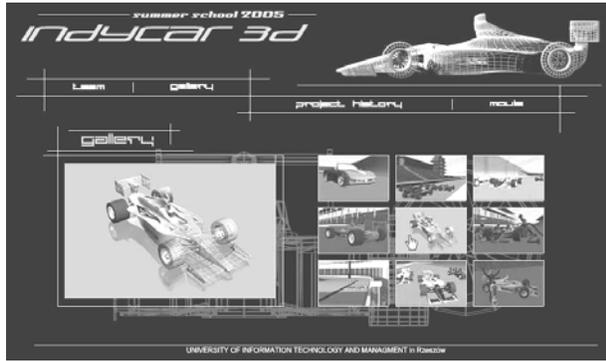


Figure 5. Screen shot of student group website.

Divided into groups of approximately ten students each, the delegation of tasks congruent with member strengths was paramount due to the extremely tight schedule. As with most academic (or real-life) scenarios, some groups performed more effectively and efficiently than others. However, while some of the participants had no previous experience with *any* type of graphics software (raster, vector or web), it was found that Polish students tended to cooperate and assist one another more than their American counterparts.

As faculty, it was rewarding to witness our students as they enthusiastically shared their passion and expertise in the various software packages that were featured during the workshops. In a diverse graphics program such as Purdue's CGT degree, individual students tend to find their particular niche, be it exacting 3D modeling, raster imaging or web development. The opportunity to teach what they know opened the eyes of some of our students to the possibility of teaching as a viable career choice.

As a grand finale for the three-week graphics workshop held in Rzeszow, a movie festival was held

during the last evening. The festival featured finished workshop animations of student groups and selected works from our combined American and Polish students. A dynamic poster announcing the event created by one of the participants can be seen below. (Figure 6.)



Figure 6. Poster announcing project screenings.

The Next Step:

After three years of offering these types of graphics workshops, Purdue University is now prepared to begin drafting a formal agreement with the University of Information Technology and Management in Rzeszow, Poland to begin offering an Associates degree in Computer Graphics Technology at that institution. Purdue University faculty will continue to travel to Poland during summer, Thanksgiving, Christmas and spring breaks to deliver intensive, for-credit courses. UITM will deliver all general education courses required for the degree which will be articulated through our respective academic administrative offices. Polish nationals are slated to pursue graduate degrees through Purdue University and serve as Graduate TA's here in the states in preparation to deliver actual CGT courses. The first of these (Professor Mira Czarnecka) will be on staff at IUPUI starting in the spring semester of 2006.

The CGT program at IUPUI is exploring academic exchange programs with Russia and France as well.