

# The Global Classmates Concept – Engineering Student Experience in a Global Team

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## Abstract

Changes in technology and tightening global linkages are creating new challenges for the engineering profession today. The environment in which the future engineer will work will be shaped by these changes. Globalization, especially in the manufacturing industry, has already begun to change the way engineers work. In the automotive industry, these challenges have been most severe in the areas of supply chain integration, organizational culture shift, and communication. More and more newly hired engineers in the automotive/manufacturing industry are required to work in global team projects. In addition to the basics of engineering, the engineer of the future will need to have a thorough understanding of the extended network of entities that form the supply chain, need to be adept in dealing with individuals from diverse cultural backgrounds, and will need to stay abreast of the latest collaborative technology available. In this paper, we present a model for teaching engineering courses through which students experience working in a true global team. As a pilot practice, this model is offered to be used in sophomore or higher level courses and is structured to contain four universities' participation. The students' work is evaluated by the respective professors from each university and both the students' and professors' experiences on working with this model are designed to be captured through an 'end project survey' form.

## Introduction

Traditional Industrial Engineering (IE) courses may be taught in a student team project format, however, coupling IE courses with global manufacturing processes and requiring team projects through which IE students truly learn about global functional teams is not a usual practice in the classroom. Following the University Synergy Program international conference and the Cordys Grant [1], the "Global Classmates" initiative was recently introduced at Kettering University. Four different universities from around the globe have pledged to participate in this pilot initiative to educate the next generation of engineering students in a global setting. A global team of students in Industrial Engineering, Systems Engineering, and Manufacturing Process Engineering, with different functional roles in a virtual organization, will work in a live meeting environment to solve a real-life engineering problem.

Numerous constraints must be overcome to form such a global student team and assign them a project that has to be completed within a required time frame. Four of these constraints stand out: (1) time difference between different countries, (2) curriculum time structure (i.e., semester vs. quarterly vs. annual time lines), (3) selecting a suitable project to serve all the requirements of different professors' syllabi, and (4) grading students' work and their contribution to the project. Furthermore, the students team collaboration, team project management, and different issues related to cultural differences, exchange of scholastic and business experiences, and communication skills must be considered.

We plan to capture the students' experiences from different countries and use it as a marketing tool for recruiting new engineering students. The project experience will also provide graduating engineering students a unique advantage in demonstrating their exposure to global team environments to potential hiring organizations. Finally, we will provide a clear process for creating this opportunity at Kettering University by special assistance from WebEx Corporation and Cordys Corporation through the use of their communication and business collaboration platform technologies, respectively[1].

### **The Global Collaboration Influence**

The inevitable evolution of global collaboration in organizations, especially in the manufacturing industry, has affected the requirements for entering engineering workforce. More and more employers are seeking individuals who have a better understanding of global organizational systems and working in a global team environment. The future successful engineer will be one who:

- will have a thorough knowledge and experience in working with complex supply chain networks
- can effectively function in a multi-cultural environment or as part of a multi-cultural team
- is trained to quickly adapt to advancements in collaborative technology.

As a leading co-op education institution, Kettering University is constantly trying to stay current with industry requirements. Recently, the 'Global Classmates' concept was initiated at Kettering University's Industrial and Manufacturing Engineering & Business (IMEB) Department. After hosting USP 2003 International Conference [2], several faculty members structured a model for a collaborative student project to be carried out cooperatively by four international universities. This idea was materialized during the "faculty roundtable discussion" at the Cordys Cordial 2004 by presenting a preliminary plan on conducting a global team project [3]. This collaborative project requires a real-time communication technology. Since the donation of Cordys Business Collaboration Platform (BCP) to Kettering University during USP 2003, it has been utilized in several courses to introduce students to the concept of Internet-based business collaboration technology. Critical positive responses were obtained from students, especially graduate students, who represented their respective organizations. They particularly expressed their appreciation for using Cordys BCP in helping their needs for effective sharing of resources within their supply chain.

A noted result from both the industry leaders and the students who attended USP 2003 was their collective recognition in further offering of collaborative learning experiences to the engineering

students [4]. It seems that the desire for higher understanding of global concepts, particularly in engineering projects, is continually increasing among the organizations. To accommodate this type of learning experience to the engineers of tomorrow, it is necessary to form a community of international universities who will participate in efforts to utilize the latest collaborative technologies in their classrooms. Forming such a community will be the main objective of Global Classmates concept.

### **The Global Classmates Concept**

Global Classmates is a virtual community that will enable the ‘globalization’ of engineering education through the sharing of in-class assignments, problems and solutions, and projects between various universities. The community will function on the infrastructure of WebEx Communication and Cordys BCP technologies. That is, all the participating universities with their selected courses will be connected for students and faculty to collaborate on the assigned projects. To assure an effective learning experience, several items are of critical importance in this virtual community:

- English, as a common language, will be utilized
- depending on the level of the course, student projects can be assigned as a real problem from an external organization or as a virtual problem created by the assigned faculty member
- there will be a dedicated site to collect the specific learning experiences of students from the perspective of cultural and timeliness issues
- a communication record/log sheet will be submitted by WebEx at the end of each project
- projects will be collected and made available for all faculty members and universities who are interested in joining Global Classmates
- A survey to evaluate both faculty and student experiences will be conducted

For the pilot project on Global Classmates, Erasmus University and Hogeschool van Utrecht of the Netherlands, Texas Tech University, and Iowa State University are contacted. The respective faculty members from each university have listed their concerns, expectations, and their available resources in order to lay a common ground for the pilot project. Working with faculty members involved in the program has helped identify several key factors for the success of Global Classmates concepts:

- A student project team will have 3 to 4 student members, one student per university – this limitation is necessary for two major reasons: to assure that the project can be handled in one semester/term time frame and to assure that Internet-based communications among the team members throughout the project’s life will be most effective.
- A project will be completed during one semester/term – this time limit is based on the fact that co-op students only attend the school eleven weeks at a time, twice a year at Kettering University. Therefore, the pilot project should be completed within a 9-week time period, beginning at the second week of the term and ending on the tenth week of that term.
- All students must be able to access both WebEx and Cordys BCP technologies – these technologies are currently utilized in all the universities who participate in the pilot

project. Furthermore, the participating faculty members are familiar with both technologies and are comfortable using them.

- Although the primary objective of student projects is to complete and present an effective solution for the project, the secondary objective is to learn to work in an Internet-based collaborative environment. Students are asked to submit a written report of their experiences throughout the project and provide specific pros and cons comparing such global project team to regular class project teams. These reports will be discussed by all the participating faculty members.
- Each professor will grade their student's contribution to the project based on their syllabus requirements. That is, every participating faculty has total control of the student's grade for the project.

A general outline of the Global Classmates Concept is presented in Figure 1. The member universities are free to collaborate with each other to determine suitable project-based partnerships. These partnerships are dynamic in nature, that is, they may be formed and disbanded on a per-need/per-term basis. Once a partnership has been established among multiple universities, they will use their available resources within their community to interact/collaborate with each other for the duration of the project, as depicted in Figure 2. Partnerships are encouraged to extend beyond a single term and in such cases, the project lead and its assignment will be rotated amongst the partners. For example, Figure 2 depicts university 4 as the lead university. This implies that university 4 would design the project based on a local company/organization need. In this mode, students from partner universities 1, 2, and 3 will benefit from working on a project from a different country. All four universities will experience working in an International setting. When this partnership is extended, one of the current non-lead universities will have the opportunity to lead the design of the next project. This rotation will take place as long as the partnership exists. Ideally, every university (i.e., faculty and the respective course) will take the lead role at least once every year.

The lead partner's role will be to collect the necessary information on the problem identified in the local company and to convey this information effectively to the other partners. Following this, all partner faculty will collaboratively replicate this problem as a virtual organizational problem, i.e., project, in Cordys BCP. It is in this environment where the students from partner universities will work to design a solution for the presented problem. After the completion of the project, the lead partner will share the final report with the local company and collect any feedback from them.

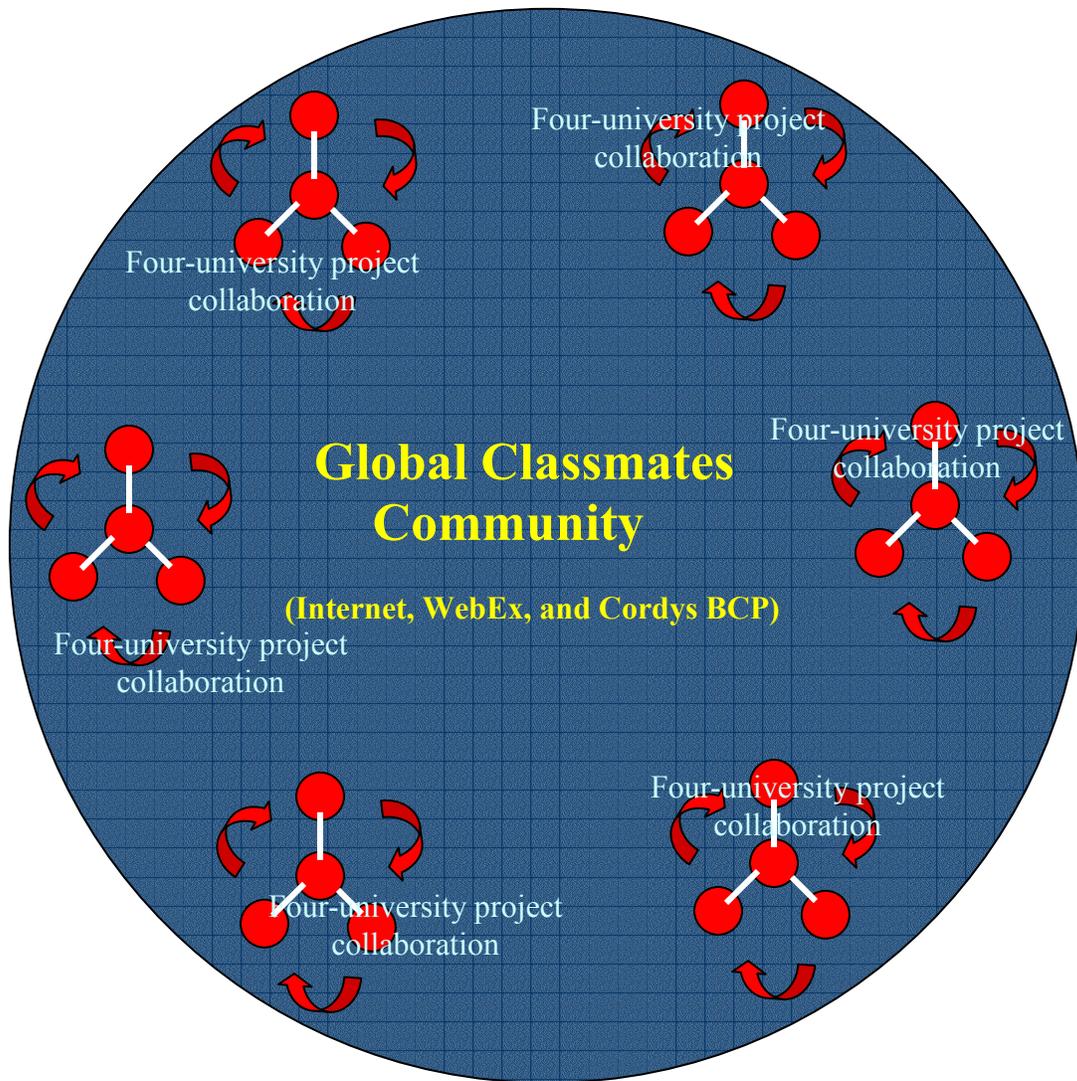


Figure 1: Global Classmates Community and its dynamic partner university relationships

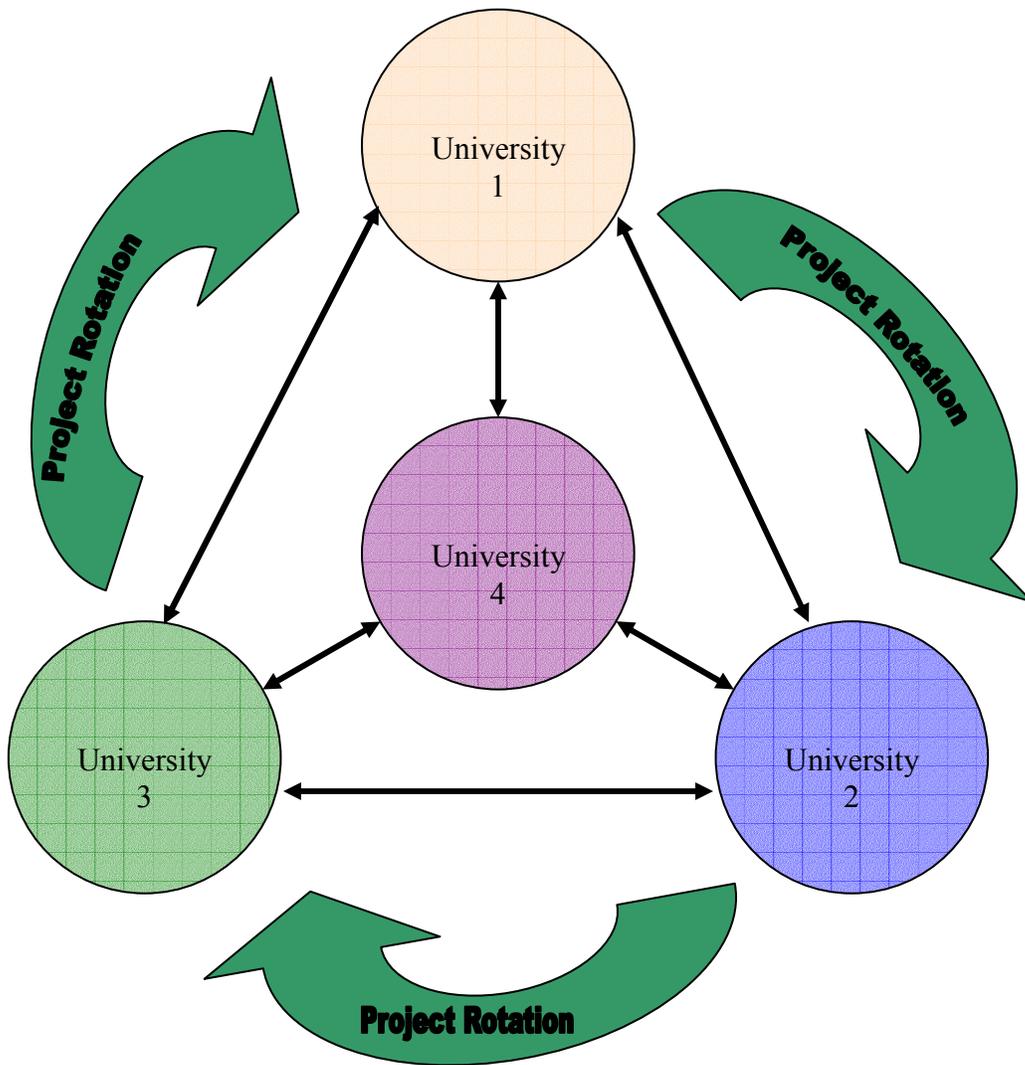


Figure 2: Expanded view of a project-based inter-relationship between universities.

## Closing Remarks

The Global Classmates concept is a new initiative introduced by Kettering University. Currently a model is being developed and defined for it. The full results of the implementation of this pilot will be reported at the end of 2005. Meanwhile, useful information is being collected through discussions with several international universities. Because of serious differences among the participating universities' academic schedules, geographical time variances, language barriers, and several other factors, all the faculty members who joined "Global Classmates" project from different universities have to agree beforehand on the nature and caliber of the student projects. Furthermore, they have to resolve several crucial issues related to the practicality of conducting such student projects considering the academic and course requirements. These issues are continually being identified and addressed. The identified issues, resolutions to problems, experiences of faculty, and student learning experiences will all be made available on the Global Classmates Community network.

For more information on Global Classmates, please contact the authors.

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## Author Biographies

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