The GET Immersion Experience: A New Model for Leveraging the Synergies between Industry and Academia

Jeff Saltz
JPMorgan Chase & Co.
Jeffrey.s.saltz@chase.com

Mark A. Serva, Ph.D.
Department of Accounting and MIS
University of Delaware
Newark, DE 19716-2715
servam@udel.edu

Robert Heckman, Ph.D.
School of Information Studies
Syracuse University
rheckman@syr.edu

ABSTRACT

This article describes a new and innovative open co-op program for MIS/IS students. The program, Global Enterprise Technology Immersion Experience (GET IE), has a global enterprise focus that is integrated with hands-on experiential work-based learning to provide a context in which students are stimulated to utilize their classroom knowledge. The program includes a two-semester internship component that can be seamlessly incorporated with an existing MIS curriculum. The internship's unique pedagogical innovation is to deliver academic coursework on global enterprise technology to the students just in time—that is, while they are participating in an extended internship. The program, in effect, creates a domain-specific, next generation co-op program that complements traditional information systems curricula with a skillset that is required for creating and running very large global enterprise applications. The guiding GET consortium consists of four universities and a number of large companies, and the consortium is open to future expansion. The continued growth of the consortium would enrich student choices and foster cross-fertilization of curriculum activities.

Keywords: Active learning, Creative problem solving, Curriculum design and development, Learner-centered education, Project-based learning, Team projects

1. INTRODUCTION

Traditional MIS curricula have focused on topics such as programming, database, and systems analysis and design. Although these topics continue to serve the discipline well, in globally distributed enterprises large scale systems increasingly play a central role. We refer to these systems as "global enterprise technologies" or "GET." The increasing reliance on GET systems (e.g., ERP, CRM, and firm-specific systems) suggests that students' knowledge of large scale systems is crucial in today's highly competitive job market (Cameron, 2010). But even though large scale systems present unique challenges that are increasingly critical (and dominant) within major corporations, MIS education often offers little or no preparation for these skills.

As a result, many large companies must train their college hires in the use of large scale systems before they can be productive. In fact, previous research has found that a common concern is that today's graduates do not have the skill sets required for large scale enterprise software development and large scale system adoption (Mulder, Lidtke et al. 1997; Davis 2004; Cameron and Purao 2010). Such practices suggest that integrating large-system concepts within a curriculum would increase the program's desirability and attractiveness to companies, as well as prospective students.

In this paper, we describe a multi-university, multi-company program that has been designed to address the challenge of scale. The Global Enterprise Technology Immersion Experience (GET IE) program provides a global enterprise focus for technology-oriented academic majors and integrates coursework with hands-on experiential learning (Saltz & Oh 2012). GET IE creates a domain-specific, next generation co-op consortium that functions across universities and major corporations. The program consists of an eight month (January through August) paid internship integrated with interdisciplinary coursework delivered through blended learning pedagogy. Students typically start the program in the second semester of their junior year, which allows them to complete the program by the end of the following summer. Because of this structure, GET IE allows students to take coursework while simultaneously working at their internship site location. Therefore, the coursework and internship creates a rich synergy in student learning. The program is designed to grow by including multiple academic institutions and industry partners. Universities and companies can join the GET IE consortium or establish their own programs by modeling our effort. At present, the academic partners include Syracuse University, University of Delaware, Rutgers University, and Ohio State University. Industry participants include JPMorgan Chase, IBM, Cisco, Ernst & Young, Nationwide Insurance, and GE.

2. RELATED WORK AND MOTIVATION FOR THE PROGRAM

There have been a few previous educational efforts to bring large scale global enterprise concepts into technology-focused curricula. Although the need for teaching large scale enterprise systems has been previously noted (Cameron 2008), faculty have typically attempted to rectify the current omission of large scale systems via the inclusion of an enterprise technology course (Wegmann 2004; Nickerson 2006). For example, previous efforts have described faculty and industry representatives working together to construct a curriculum component that is designed to prepare students for developing large scale systems from the very beginning of the system design and specifications to development of communication skills necessary for such a work environment (Lidtke and Stokes 1999). University faculty and industry representatives worked together to develop this course (Lidtke and Stokes 1999). Other efforts have described enterprise integration using a business-centric method for a course at the senior undergraduate level (Davis 2004). Researchers have argued that in enterprise systems education, both technical and business aspects of systems development must be taught to fulfill the pedagogical requirements for such a curriculum component (Cameron 2008).

Several industry-academia collaborations have also been successful. The University of Washington (UW) and Boeing collaboration (Williams 1997) provides a senior-level software engineering capstone course that helps fill application developer positions in the greater Seattle area. The collaboration's goal is to develop a new paradigm for teaching large complex information systems within the context of an industry environment. Senior level students at UW were given opportunities to work on projects defined and offered by Boeing. As an evaluative result, all of the participating students responded positively to the surveys about the course.

Although these efforts offer improvements over the traditional MIS curricula, developing software applications for large global enterprises requires an understanding of how scale impacts software requirements, hardware and software architectures, and the project management of a large team that is often globally distributed. These concepts are not easily incorporated within a single course. In addition, many faculty members do not have domain expertise in these areas. Furthermore, creating a course that leverages an enterprise computing environment is extremely difficult: universities cannot afford to acquire, install, and maintain hardware and software at the same scale as large companies. These limitations reduce students' ability and the context's capacity to demonstrate the true challenges introduced with large scale systems (Davis 2004; Prigge 2005).

Several authors have generally suggested that these shortcomings can be overcome by combining a work-based experience into the overall curriculum design, as well as into specific courses (Carpenter 2003). They argue that the most successful experiential learning is likely to occur in context of formal partnerships between businesses and educational institutions (Jackson and Wirt 1996; Sovilla 1998; Devier 1999). For example, Bartz and Calabrese (1991) argue that students will benefit from interaction with professionals in the field and exposure to real situations in the field.

Because large scale systems require exposure to such a rich and highly contextual environment, immersing students within the context of a real organization provides a considerable incremental improvement over the traditional classroom model. A program that aspires to prepare students for working in large scale enterprises must leverage experiential learning, which has been shown to be a key part of how one educates students in the domain of large scale enterprise computing. For example, researchers have previously discussed an experiential learning model for teaching enterprise-level software development and for integrating such learning components into existing curricula (Cameron and Purao 2010). The study found that human-level communication, collaboration skills, and an experiential learning approach better addresses the educational needs of today's rapidly changing technological fields.

The GET internship program augments face-to-face instruction with distance-based learning methods while students work (e.g., online web discussions/blogs and weekly synchronous conference calls). The use of these tools not only exposes students to these growing technologies, but—because their teams are often located in different sites within the same company—students also learn to leverage these tools to better manage and collaborate with virtual teams during their internship and in the future. Students working at JPMorgan Chase, for example, often utilize Cisco's TelePresence—a state of the art video-conferencing tool.

3. PROGRAM BACKGROUND

The Global Enterprise Technology Immersion Experience (GET IE) provides a new model that enables students to take courses while simultaneously working at a company-sponsored internship. Unlike a more traditional co-op program in which the academic content and work experience occur sequentially, the GET program integrates the simultaneous delivery of course content with the work experience, which enables a rich synergy in student learning. Students are encouraged to take the program starting from the spring semester of their junior year, with the program ending at the end of the subsequent summer.

3.1 Application and Admission

Each fall, students who are interested in the GET IE program post their resume at an online system hosted at Syracuse University. The criteria for being considered for the program vary across universities, but students are in general expected to have a minimum GPA of 3.0. Average GPA of students accepted into the program is 3.3. While the program is focused on students majoring in MIS and computer science, it is also open to students with less technical majors (ranging from government majors to students studying business). Students can apply for any of the different internship positions offered by the companies participating in the program. The positions include roles in diverse functions such as business analysis, application development, and program management. Participating universities can recruit local companies (as long as they are large and globally distributed) that are likely to appeal to their students. These companies also get the benefit of having students from other universities in the GET IE program apply to positions posted by that company. Finally, each company evaluates the resumes and conducts face-to-face or telephone interviews with the candidates who meet their needs.

Admission to the program is contingent upon receiving an internship job offer from at least one company. Students who accept an offer will participate in an eight month internship that runs from January through August in the following spring. The length of the internship provides a rich opportunity for learning, since students can work on real-world problems—not just an easy task that has been created specifically for interns. Students are paid for their internship work, and pay levels are attractive, since companies find that the eight-month term allows students to become more productive than they would be in a ten-week summer internship.

Admission into the program is highly selective. In fact, approximately 25% of students who apply for the program are admitted into the program. However, perhaps due to the selective nature of the admission process, since the inception of the program, student retention through the end of the summer program has been 100%.

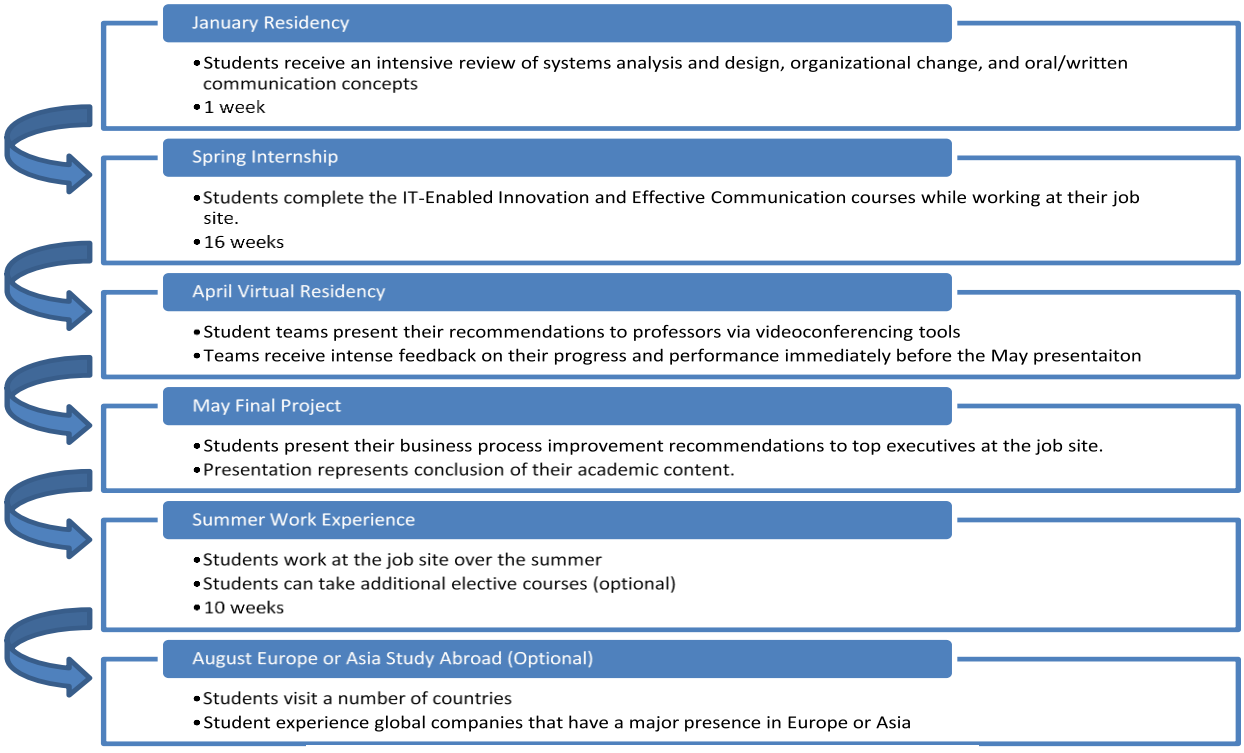


Figure 1, GET Immersion Experience Timeline January 2013

3.2 Program Timeline

The eight-month internship begins with an intense, one-week residency in January that kicks off the program (see Figure 1 for the complete program timeline). The January residency prepares students for the next eight months and introduces the coursework that will be delivered to the students while they are working at their immersion company. During the residency, students are placed into project teams. Although students within one team typically work for the same company, most teams have members who are not co-located with other team members once they begin their internship work assignments. Since they will be working on projects together during the eight month internship, this configuration requires students to work virtually and leverage the conferencing tools that are available.

The January residency begins with a review of systems analysis and design and enterprise architecture. Over the remainder of the residency, student teams complete a case that requires them to apply analysis and design concepts, including the challenges of organizational changes within large organizations. Teams present their recommendations, and are subject to an intensive review of their communication and presentation skills. The residency structure leverages faculty from different universities, which exposes students to top faculty in that area of coverage. The residency also brings in managers from GET partner companies, who relate their experiences and expose students to real experiences, as opposed to simply academic theory.

After the January residency, students report to their immersion companies and have three main responsibilities: their fulltime paid internship, their coursework, and an IT-enabled innovation project. For the internship, each student is assigned to a work site supervisor, just like any other fulltime employee. Each student is also assigned to a corporate mentor to complement the feedback and counseling received from the work supervisor. In addition to their work responsibilities, students also continue the coursework that began in the January residency. Faculty provide exercises in business communication and on the use of large scale systems. Content is delivered via email, web tools, and phone conferences. Faculty supplement their interaction using an integrated video conferencing session in April (the "virtual" residency). During the virtual residency, students are exposed to proper etiquette while using advanced videoconferencing tools, such as Cisco's TelePresence. Over the course of the semester, faculty visit each student onsite, to ensure that the internship experience remains on track and learning objectives are being met. Finally, teams work on an IT-enabled innovation project proposal under the joint guidance of faculty and corporate mentors. In early May, students present their project proposals to top executives at the company (last year, the CIO of JPMorgan Chase was one participant).

After May passes and the project proposals have been presented, students then return to work for the remainder of the summer. During this summer time period, students have the opportunity to complete additional elective course work. The elective course work includes an opportunity for self-directed technology education jointly supervised by faculty and corporate supervisors, and a two-week course in Europe where students learn how the largest global corporations use information systems to address the challenge of global coordination.

3.3 GET IE Academic Program Focus

Students can receive anywhere from twelve to nineteen credits for participating in the GET Immersion Experience, depending on elective courses chosen, and how their individual programs of study count internship credits. At the highest level there are two major areas of focus within the program: (1) how scale impacts the technology for large scale systems, and (2) how scale and distribution of teams drives the need for effective communication within a global enterprise.

Large Scale Systems. Students learn how the scale of a global enterprise system is different from a smaller system. For example, for a global banking corporation, eliciting and developing the requirements for a system with 100 million accounts will require different knowledge and skills (e.g., about software and architecture) than a system that will support ten thousand accounts. This understanding needs to occur both from a technical perspective (e.g., application architecture, system requirements, database design) as well as a business perspective (e.g., return on investment, organizational change issues, buy vs. build, open-source vs. cloud models).

Scale and the Importance of Effective Communication and Collaboration Skills. Students use videoconferencing tools extensively (e.g., Adobe Connect and Cisco TelePresence) to present their projects, report to faculty, interview end users, and to communicate with other team members. By applying these state of the art tools, students learn to elicit requirements from distributed end users, to effectively present a software idea to a group of people with varying technical and business expertise, to lead a distributed meeting, to use a blend of distributed collaboration technologies, and to provide an "elevator pitch" on a key issue or opportunity.

These two major areas of focus lead to the following nine specific learning outcomes, used in developing and evaluating the program:

- ***Written and verbal communication for the 21st Century.*** Students can prepare and present effective, well organized professional material in an effective manner, both orally and in writing (including presentation decks, graphical displays of numeric data, executive summaries, e-mails, etc.).
- ***Critical thinking to solve large and complex technical challenges.*** Students are able to map large scale business challenges and questions into structured problems, and apply analytical techniques to solve them.
- ***Large-scale enterprise information system concepts.*** Students can explain enterprise technology concepts, and apply those concepts to propose appropriate enterprise technology solutions
- ***Key technical challenges in building/running large global systems.*** Students can explain multi-tier architectures for large scale systems, explain how scale impacts technical solutions for large scale system
- ***Key organizational challenges in building large global systems.*** Students can explain how large scale impacts the organization and the team in large IT projects

- ***Running IT as a business.*** Students are able to apply analytical techniques to undertake IT-enabled business strategy, change management, and innovation.
- ***Collaboration and work in groups.*** Students can navigate corporate culture, and avoid potential obstacles to project success
- ***IT Enabled innovation and change.*** Students are able to develop an innovative, IT-enabled, strategic proposal, present it to senior managers in an organization, and develop a change management plan to implement it.
- ***Reflection on professional learning.*** Students gain a deeper understanding of their personal strengths and weaknesses in the areas of technical skills, communication skills, and leadership.

3.4 The GET IE Curriculum

Each course within the GET IE program is designed to address the unique needs required to support GET systems, as well as leverage the work context to which the students have access and experience. In other words, the courses within the GET IE program leverage the fact that students are working while taking courses.

The innovation project involves: (1) Developing an IT-enabled innovation proposal; (2) Developing a change plan to implement the proposal; and (3) Presenting the idea to managers in their host organization. Students work across the following three core courses when working on their IT-enabled innovation project:

Core Course 1: IT-Enabled Innovation and Change in Global Enterprises. Students work to understand how to use IT to solve a problem or create competitive advantage within a global enterprise. Students gain an understanding of how to develop a strategic approach to technology innovation and change and the organizational implications of innovation. Students gain an appreciation of how the solution must consider technical obstacles, organizational challenges to adoption, as well as financial considerations. Finally, students must identify key challenges of the idea across the systems development life cycle. Students then present their innovative proposals to senior management within their host organization.

Core Course 2: Communication Practicum. This course focuses on improving a student's presentation, meeting, and networking skills by delivering practical guidance and advice for work and school tasks and projects that are occurring during the spring semester. As such, course assignments are often based on student experiences and deliverables that occur within the work environment.

Core Course 3: Enterprise Systems Strategies and Architectures. Students build a foundational understanding of the application architectures that comprise enterprise computing environments. Topics covered include enterprise multi-tier architectures and messaging to support those architectures, achieving highly available and scalable systems, transaction processing and an overview of enterprise databases (relational and non-relational).

In addition to the core courses, students are encouraged to take additional electives, which change from year to year, but often include courses such as:

Example Elective A: Leadership and Ethics. Students gain an understanding of the difference between management and leadership and how ethics and leadership are intertwined. In addition, student gain insight into different leadership styles through reflection on actions observed in large-scale and complex global work environments.

Example Elective B: Individualized Technology Education. Students complete a self-directed technology education that is jointly supervised by faculty and corporate supervisors. Specifically, students gain an appreciation for life-long learning and on-the-job training by working with faculty to select specific technology coursework that will support the student during their internship. Completion of the coursework is self-directed and self-paces, but is reviewed by a faculty member to ensure progress and completeness.

Example Elective C: EuroTech. Students experience the global economy while being immersed in the culture of Europe during a 15 day trip to cities such as Amsterdam, Paris and Rome. Students focus on comparing and contrasting how some of the largest global corporations use information to address global technology opportunities and challenges.

3.5 GET IE Course Mappings

One of the key challenges in creating a new area of focus is determining how the new courses can fit into a students' program of study. Of particular focus is determining which courses can count toward technical electives, a communication requirement—or in the worst case—free electives. In general, the suggested mapping for GET IE courses for an MIS student is as follows:

- Core: *IT enabled innovation and change in Global Enterprises* - Technical Elective
- Core*: Communication Practicum* - Communication Requirement or Technical Elective
- Core: *Enterprise Systems Strategies and Architectures* - Technical Elective
- Elective: *Leadership and Ethics* – either an ethics requirement or a Free Elective (other electives vary, depending on the specific course content).

In examining the above mapping, there are some items to note. Students can take as many electives as they desire. At some universities in the consortium, the IE courses are used to complete a GET concentration or minor. Alternatively, students could use the courses to fulfill technical electives within the MIS major. As a specific example, the net impact for a typical MIS student at The University of Delaware (UD) is that two courses would count toward core MIS courses, and two as major electives. This course distribution fits nicely with the UD program's recommended program of study. Finally, some schools require an ethics component. For students from these schools, the leadership & ethics course can be used to fulfill this requirement.

Universities who participate in GET determine, of course, how specific GET courses map to their students' graduation requirements. In addition, while some universities have dedicated GET minors or concentrations, other universities allow the courses to substitute for electives and even required core courses within a major (e.g., MIS or CIS).

4. ANALYZING THE PROGRAM

We evaluated the GET IE program using unstructured observations, structured surveys of both students and their managers, as well as unstructured student surveys. This section first discusses a summary of the key advantages we have seen in GET IE. We then highlight a few comparisons of GET IE with more traditional programs and highlight some program challenges and disadvantages of running GET IE. Finally, we report on feedback from students, faculty and employers – using both quantitative and qualitative analysis.

4.1 Program Advantages

The GET IE program has four distinct advantages, which will be discussed in greater detail in this section:

1. The GET program integrates concepts not only within each class, but also provides a mechanism for students to integrate concepts across the curriculum.
2. By working and taking classes simultaneously, the GET program provides an environment where continuous learning can occur.
3. Students increase learning through business and academic boundary spanning activities.
4. Due to students having to select an innovation project and then socialize that idea across the company, students have the opportunity for increased networking and practicing effective communication.

4.1.1 Integration of Concepts across the Curriculum: As outlined above, the first advantage of the GET program is that it integrates concepts not only *within each class*, but the eight month internship provides a mechanism for students to integrate concepts *across the curriculum*. Traditional MIS classes often integrate concepts through a capstone course, which provides a central problem for students to solve. As a result, today's graduates have a solid foundation in software engineering and the software development life cycle, but only within the limited context of a college classroom.

This limited focus often forces new hires to go through an initiation period where the newly-hired employees realize that—unlike academia—concepts in the real world cannot be "silo-ed." Only after starting their jobs do graduates realize that their undergraduate education lacked a real-world context and that large scale computing insights were not integrated (or not included at all) in courses taught at their undergraduate institution. Summer internships, due to their short nature, also typically do not deliver this realization. Hence, retraining is often necessary at this point because MIS curricula often lack concept integration across an entire curriculum.

In contrast, the structure of the GET IE program enables several unique learning opportunities that are typically are not possible during a traditional college semester. Intensive residencies (in January and May) are leveraged to simulate the "stress" of a deadline within the work environment. This intensive work environment not only builds student confidence (so that students are better prepared for the demands within the work environment), but is also used for "team-building" of the cohort (since, when students are working, they are located across many work locations). In addition, the course that includes the IT-enabled innovation is integrated with the communication practicum so that a common innovative project is assigned across the two courses. The project, developing an IT-enabled innovative proposal and a change plan to implement the proposal, is presented to managers in the host organization. The presentations include an "elevator pitch," a written presentation and an oral presentation. We have found that practicing these skills within a traditional classroom setting is not nearly as effective (and motivating to students) as having the chance to practice these skills within a work environment, with oversight and coaching from a university. For example, early within the internship, students must network to explore different possible IT innovation ideas and explain their ideas to get feedback/refinements of their idea. This opportunity enables students to practice effective communication as well as improve their understanding of large scale systems, and how they are created within large enterprises.

4.1.2 Integration of Courses with Work: A second advantage of the GET program is that students take classes while they are on the job, which provides a continuous model of learning within a business context. Within a traditional internship or co-op, students alternate between extended periods of work and taking classes. This discontinuity forces students to apply the academic concepts at a much later date (as long as six months later). Within the GET program, students take the classes *while they are working on their internship*. This model allows students to apply the supplied course concepts (e.g., effective communication within virtual teams, facilitating organization change, software engineering, feasibility analysis) while they are working on the relevant project. A program that integrates learning concepts within a real business context represents a better learning opportunity for students. We also note that while the infrastructure required for a university to initiative a full coop program may be prohibitive, the GET model is likely more accessible, given the used of shared resources across universities and businesses.

The IT-enabled innovation project also reflects the synergies that are possible with simultaneously providing academic content while working on the job. Developing global-scale software requires not only technical knowledge, but also understanding the difficulty, for example, of instituting organizational change and the importance of working with system stakeholders. In the workplace, developers must not only develop the code, but also be cognizant of the project's budget and timeline. These topics are often taught independently of each other: in a real business situation, however, technology, business, and organization needs must be balanced. The integration also extends to the support that the student receives while participating in the GET IE program. In particular, faculty interact with students extensively during their work assignments and this interaction enables faculty to more effectively support the students' integrated education across both classroom and work-based learning. At the same time, students have both a peer and a senior mentor within their company to advise them from a business perspective.

4.1.3 Learning through Boundary Spanning: Students are exposed to three boundary situations, and each creates unique learning opportunities. For the first example, students in the GET IE program span the boundary between *faculty and managers/mentors*. This boundary creates a situation where the students receive conflicting advice from faculty and industry mentors, such as what should be included in a presentation. When this situation of conflicting advice occurs, students must weigh the conflicting advice and determine how to incorporate the information. This conflict provides a context where students need to integrate theory (foundational learning) with the "real world" insight from managers and mentors.

Within GET IE, students also learn to span the boundary across *business units*. Student team members work within a single company, but the students typically work across multiple lines of business. The students work together exploring their organization, and how to improve the organization (via an IT-enabled innovation project). The students talk to managers and mentors to obtain suggestions on project ideas, as well as feedback on possible projects suggested by others. By working across business unit boundaries, students are required to understand the differences across the organization, but also understand how to share a best practice developed in one business unit with the other business units across the firm.

Within the academic context, students learn to span the boundary across *academic disciplines*. Student teams consist of computer science, MIS, and business management majors. Students in these interdisciplinary teams are required to work across academic domains (as is done in the real world). Students must also communicate effectively across cultures/vocabularies/areas of expertise and understand their domain. These heterogeneous teams also discourage free-riding, since each member plays an important and unique role within the team.

4.1.4 Increased problem solving and networking: As briefly noted earlier, one might compare the GET program course to a capstone course or service course. In a capstone or service course, students often interact with a client to understand a problem and how technology can be used to help solve that challenge. The GET innovation project, however, provides significant benefits beyond a typical service course. Two of the key differentiators are:

- ***Students define the project for their host company***. Since students are full-time employees of the company, they are expected to understand the company's business process inefficiencies with much greater insight than can be achieved with a senior projects course. One of the greatest advantages and strengths of the GET internship is the requirement that the students identify and define the innovation project. This contrasts with a service or client-focused capstone course, where—out of necessity—students are usually given a case to solve. Within GET, students can leverage the richer context of the work environment. Because students work in teams, each student can compare what he or she is doing with what other team members are doing in different parts of the company. These interactions also an even greater exposure to the company's operations, providing an even broader context and understanding of company operations.
- ***Navigating a large global company***. GET students are also offered another important learning opportunity by enabling them to network within a large global company. Such formal (meetings with senior mentors) and informal (conversations with colleagues in the hall or elevator) allow them to identify potential ideas and discuss those ideas with potential project sponsors and internal domain experts. In one situation, a student discussed an idea with his manager, who informed him that the project had failed a number of times, had resulted in a manager leaving the company, and was now considered "the kiss of death" to take on. These interactions, which may occur in a building or across time zones, enable students to learn the challenges of organizational change and the politics of instituting that change. In communicating their ideas to colleagues and managers, students are required to think out their ideas and practice their communication skills. Students also gain an understanding of the real process used to identify and create a technology solution within a global enterprise. In contrast, most service courses (or capstone courses, if they interact with a client) interact with a small group of people at the host company, often over the phone or through limited face-to-face meetings.

Because of these differences, we have seen increased student motivation, as compared to other more typical course and capstone projects. Although students in a service course are genuinely motivated to help their client, student motivation appears to be greater during GET IE. Student motivation is likely heightened for a number of reasons. Students are in effect prospective job candidates, which may not be the case in senior project courses. Because students are immersed in the company culture, they also spend a significant amount of time experiencing and analyzing the company's process. Such immersion is not possible in a senior projects course.

4.2 Program Assessment

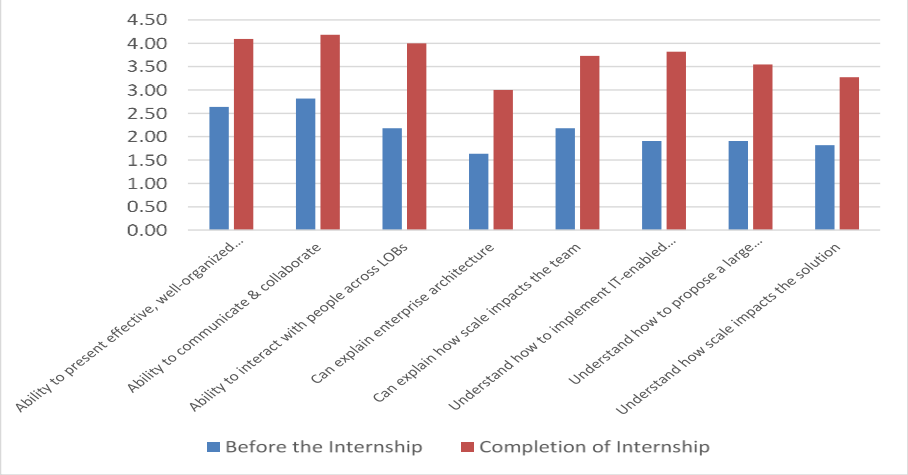
To evaluate the GET IE program in a systemic way, we have begun a series of assessment activities. We have designed a longitudinal assessment program to evaluate the ability of the GET IE program to meet its stated learning outcomes, and its effectiveness in preparing GET program graduates to succeed professionally at global companies where large-scale information systems are pervasive. As the primary assessment method of the program, data from the assessment will provide valuable empirical input to the ongoing process of updating and designing future versions of the programs. Data collection will begin with GET IE alums graduating in May 2013.

The longitudinal assessments are intended to measure the how the outcomes of participation in GET IE persist and evolve over time, and affects the career trajectory of graduates. Results of these assessments will provide valuable empirical input to the ongoing process of updating and designing future versions of the programs. We have also developed a process for collecting and using longitudinal assessment data that includes instruments designed to

evaluate the learning outcomes described in section 4.3 above, and to monitor graduates' career progress. The instruments will be used at the following data collection points:

- ***Exit Survey.*** To be administered to all GET IE program graduates in the semester of graduation.
- ***Exit Interview.*** To be administered to a sample of GET IE graduates in the semester of graduation.
- ***Longitudinal Graduate Survey***. To be administered to all GET IE graduates at three points after graduation: 1-year, 3-years, 5-years after graduation.
- ***Longitudinal Graduate and Supervisor Interviews***: To be administered to a sample of GET IE graduates and their supervisors at three points after graduation: 1-year, 3-years, 5-years after graduation.
- ***Anonymized Performance Evaluation Data***. We have asked that one company share anonymized, aggregated performance evaluation data for GET IE graduates that it hires into permanent positions after graduation. This data will be collected for employees at the time of their first annual performance review, or at another time deemed more relevant and useful by the company. Aggregated and anonymized data could then be compared to similar data for students who have not gone through the program.

- The below graph visually portrays how the interns felt their skills rated at the beginning of the internship and compares that skill level to how they rate themselves at the present time. For each question, the difference in height reflects the amount of improvement over the course of the internship.
- Interns rated themselves on a scale of 1 (novice) to 5 (expert). The graph shows the average response.



Learning Outcome	Before	After Completion	% Improvement
Ability to present effective, well-organized material	2.64	4.09	55%
Ability to communicate & collaborate	2.82	4.18	48%
Ability to interact with people across LOBs	2.18	4.00	83%
Can explain enterprise architecture	1.64	3.00	83%
Can explain how scale impacts the team	2.18	3.73	71%
Understand how to implement IT-enabled innovation	1.91	3.82	100%
Understand how to propose a large innovative project	1.91	3.55	85%
Understand how scale impacts the solution	1.82	3.27	80%

Figure 2: Learning during GET

Given that the program is new, the results that have been collected to date are preliminary, but promising. While developing the longitudinal assessment program, we have gathered preliminary formative assessment data from 2012 GET IE students and their managers. At the conclusion of the internship we asked students and managers to evaluate perceived learning along eight dimension related to the program's learning outcomes and/or suggested by industry managers. Both students and their managers were asked to evaluate student performance on these dimensions at the beginning and end of the internship. Figure 2 shows that both students and managers reported substantial progress by the end of the internship.

In addition to obtaining the perceived learning information noted in Figure 2, we also obtained open-ended student impressions of the GET IE program. As can be seen from some of the responses in Table 1, 83% of the students reported a very good experience, and 92% would recommend the program to someone else. The senior mentors and professors were also evaluated positively. We also present the student's satisfaction scores from 2012, which generally demonstrate improvement.

At the same time, the feedback also provides a clear direction for improving the program. Placement of students within their job needs to be improved, as only 67% felt the position was a good fit for them. Career services also received low numbers in preparing the students (42%). Companies were clearly not prepared for the students, as only half felt they received adequate communication before starting, and many commented that the companies were not prepared for them once they arrived. Before this year, students were required to attend a May residency at one of the GET partner universities. Students suggested eliminating it and instead extend the January residency. Student feedback indicated that they felt traveling to the May residency was challenging, that it felt anti-climactic after completed their final project, and that they would prefer to start working in their summer position. Faculty accepted this suggestion, and the change will be implemented for the 2012-2013 school year. The timeline in Figure 1 reflects this change.

In addition to student feedback, managers at the GET partner companies also completed a survey. Out of the twenty-six managers surveyed, twenty completed surveys. Although managers believed that all students were judged to be a good fit for their prospective job, some areas of improvement were identified. Consistent with that sentiment, only 70% of managers judged the communication received before the internship started to be excellent or very good. This result is consistent with the students' responses, which indicated that the companies were not ready for them upon arrival for their internship. Clearly, the communication between the universities and the companies before the internship starts needs to improve so that both have a better idea of what is expected of both parties. Senior mentors also reported that only 2 out of 5 (43%) were strongly involved in their mentee's final team project. At the same time, 93% of the managers who attended the final presentations rated them as excellent or very good. Another way to understand

Student Summary Statistics: 2012

Program Strengths

- 83% of interns had an excellent of very good experience.
- 92% of interns would recommend the program to someone else
- "Having the ability to utilize senior mentors as well as having the backing from senior executives gives us an advantage that most interns do not have."
- "The length of the internship is perfect!"
- 92% of interns rated their senior mentor as helpful or very helpful.
- 100% of interns felt professors helped prepare them "well" or "very well" for their final presentations in front of top management.

Areas for Improvement

- Only 67% of interns thought their position within the company was a good fit for them.
- In general, interns felt companies were not prepared for them when they arrived in January.
- 50% of the interns rated communications from the company before starting as good or fair.
- "Previous GET students should submit a job description of what they did during the internship to give examples to incoming interns."
- Senior mentors should be in the same line of business as mentee so that they can relate to final project.
- 67% of interns rated the guidance/direction provided by faculty as good or fair.
- 42% of interns felt career services center prepared them "well" or "very well".
- Combine January and May residency into one residency.
- Universities need to work more closely with companies in developing the curriculum.

	2012
I felt the company provided enough information prior to starting the internship.	67% agreed or strongly agreed
I felt the career services office prepared me for the internship.	42% agreed or strongly agreed
I felt my university and the company were on the same page with information and logistics	33% agreed or strongly agreed
My overall GET experience was….	83% rated excellent or very good
The guidance provided by the company during the GET experience was…	67% rated excellent or very good

Table 1. Student Feedback

4.3 Program Challenges

Like co-op programs, one key challenge for GET IE is that students need to be away from campus for a semester. For students working far from their home school location, students have the additional complication of maintaining housing in two locations (i.e. subletting their "near-campus" apartment and finding a new place to live in their work location). Although we have found that students have all handled this challenge, and in fact grown from the experience, it is clear that this added complication dissuades some students from participating in GET IE. Complicating the challenge of time way from campus is that during the GET IE time period (spring of their junior year), many students had planned to study abroad. In fact, some students have been forced to choose between GET IE and study abroad. One way to mitigate this impact is with more up front planning. For example, we have had students do study abroad earlier (second semester sophomores and fall semester juniors) so as to be able to participate in both study abroad and GET IE.

Finally, although faculty have been enthusiastic about the learning potential of the GET IE, the administrative challenges (e.g., handling tuition differences, administering financial aid, determining how courses "count" at the home university) has been more challenging than expected. Faculty load is always a concern. At present, both Syracuse and Delaware are committing considerable faculty time to allow the program to develop to its full potential. The program is indeed growing, and the expectation is that the load levels will achieve an economies of scale within two years.

Ironically, one of the greatest challenges involves managing the program's scale. Coordinating course content and flow across universities and different faculty can be a challenge, but also provide important and timely lessons on project management that faculty perhaps need to revisit. In short, the program is providing important lessons to the participating faculty, including the understanding that instituting change is never as easy as expected.

5. CONCLUSION

The GET IE program continues to evolve and grow. It started with eight students in 2009, and has grown to thirty-one students in 2011. In terms of educational background, students have participated in the GET IE program across a variety of majors, but most of the students have been either computer science or MIS majors.

By leveraging the technological tools available for blending learning within a work-based learning context, the consortium continues to blur the boundaries between learning environments. This integration enables the program to exploit the learning potential afforded by crossing boundaries, and creates a new model for work-based learning. The GET

Immersion Experience makes possible learning activities performed in context. Previous research has found that even abstract technical concepts are better understood in the context and culture of practice and that workers learn more effectively by participating in a community of practice than through traditional training (Brown, Collins and Duguid, (1989; Brown and Calabrese 1991). Education that ignores the complexities of the work context cannot accurately reflect actual practice. The GET IE curriculum, continuously integrated with meaningful work, provides a support structure that enables students to more rapidly tie foundational concepts with what they are experiencing in the work environment.

This model, while extremely useful for the study of information systems, can be easily adapted for other fields of study, ranging from engineering to marketing. Hence a future area of exploration might be to adapt our model to other fields of study. Another area of potential exploration might be to explore other technologies available for blended learning (such as social media techniques such as online polling) to understand how to improve on our current use of blended learning technologies.

The GET program continues to grow and thrive at Syracuse University, University of Delaware, Rutgers, and Ohio State, and the consortium continues to seek other universities to participate. As outlined, the program has the potential to be a new way of thinking—not just about large scale systems, but also how to leverage the synergy between academia and business via this new open co-op model of education.

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AUTHOR BIOGRAPHIES

Jeff Saltz is responsible for the technical aspects of GET, JPMorgan Chase's unique corporate-university collaboration program, including curriculum and applied research. Saltz is also a university professor at Syracuse University. Jeff's previous roles include being the head of technology for risk and authorizations for Chase Credit Card, vice president of computational technology for JP Morgan and chief technology officer at Goldman Sachs/Goldman Sachs Ventures. Jeff started his career as a technology leader with Digital Equipment Corp. Saltz holds a B.S. degree in computer science from Cornell University, an M.B.A. from the Wharton School at the University of Pennsylvania and a Ph.D. in information systems from the New Jersey Institute of Technology

Mark A. Serva is an associate professor of management information systems at The University of Delaware and the program director for UD's GET curriculum. Mark has published articles in *Decision Sciences, IEEE Transactions for Engineering Management, and Commun-ications of the AIS*, among others. The recipient of numerous teaching awards, Mark has conducted dozens of teaching workshops in the US and around the world. He holds an MBA from Syracuse University and a Ph.D. from The University of Texas at Austin.

Robert Heckman leads the Global Enterprise Technology (GET) Curriculum project at Syracuse University. He has previously served as Graduate Program Director, Associate Dean for Academic Affairs, and Senior Associate Dean in the School of Information Studies at Syracuse. Dr. Heckman's research interests include design of work-based learning experiences, learning strategies for information professionals, self-directed learning, and collaboration in virtual communities and teams. He received his Ph.D. in Information Systems from the University of Pittsburgh.

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