

GLOBAL WORK TEAMS: ARE WE ADEQUATELY PREPARING OUR ENGINEERS?

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PREMISE

The world is in the midst of a transformation in the workplace that is profound and pervasive. A number of factors have come together to create a new reality: the global economy, advances in virtual communication, and changing demographics. Today's workers find themselves in global enterprises and on teams that are cross-cultural in nature and that interact in virtual, technology-driven environments. The significant opportunities and challenges inherent in this new world of work call for knowledgeable people who have the ability to work in rapidly-changing environments. Technical skills are a necessary, but not sufficient, requirement for success in this new world of work.

The impact of this new "sociology of work" cuts across many professions, but impacts engineers even more than most. The nature of the work of an engineer is such that Global Work Teams are a very common reality. So we must ask: "*Are we adequately preparing our engineers?*" While some universities and businesses are beginning to address this, there is a great deal more that can be done. Research on virtual / global teams is beginning to shed light on what contributes to success and failure, and it is time to ensure that this information shapes how we prepare our engineers.

The cost of *not* asking this question is great. According to the Center for Intercultural Communications at the University of British Columbia, over 70% of international joint ventures fail due to cultural misunderstanding. Such failures cost global firms billions of dollars annually.¹ For example, the much publicized recall crisis that Toyota faced in 2010—based on an alleged runaway-acceleration problem—was characterized as a cultural failure, with a major auto-industry analyst suggesting that Toyota must learn to trust non-Japanese executives.² The highly publicized Daimler-Chrysler "divorce" is largely considered a cultural breakdown.

The examples cited above relate to business impacts, but perhaps even more important are the contributions that engineers can make to some of the world's most pressing problems, as outlined in the "The Grand Challenges" identified by The National Academy of Engineering in the US. These Challenges include: clean water; carbon-sequestration; renewable energy; health and medicine; cyber-security; and others.³ These problems will not be solved by one country, or one culture, or one genius. They will be solved by teams of people from around the globe bringing diverse perspectives and creative solutions to bear. They will be solved by people, many of them engineers, working in Global Teams who must learn to cooperate across time, distance and culture.

DEFINITION OF GLOBAL TEAMS / ADVANTAGES

My definition of Global Work Teams is derived from the work of Peterson and Stohr: *A Global Work Team is a group of individuals who work across time, space, culture, and organizational boundaries, with*

*links strengthened by webs of communication technology. They have complementary skills and are committed to a common purpose, have interdependent performance goals, and share an approach to work for which they hold themselves mutually accountable.*⁴

A key benefit of Global Work Teams is to make geography irrelevant to the conduct of business. Such teams have many advantages for those organizations that can use them effectively. And they are most certainly here to stay. To explore just a few benefits they afford:

Cost Savings: This can be realized in obvious ways like lower costs due to reduction in travel, and the increased productivity of workers who are not spending valuable time in transit and or recovering from jet-lag. It can also result in shortened product life cycles, and accelerated problem-solving, as teams around the globe can work on a project on a 24-hour basis.

Improved Effectiveness: Global Work Teams provide an organization with access to the best talent pool that can be drawn from around the world. They also enable resource sharing. Organizations no longer need to create “mini-me” enterprises in different locations, but can pool resources and share expertise.

Increased Creativity: Engineering is all about problem-solving. Global Work Teams bring diverse perspectives to the table and, if harnessed effectively, can yield rich and creative solutions. They also unleash the power of local knowledge, making organizations more relevant and responsive.

CHALLENGES OF GLOBAL WORK TEAMS

There are distinct challenges in the cross-cultural terrain and cyberspace that Global Work Teams must navigate. Because of this, many teams do not realize their full-potential, or even, worse, fail completely. A recent survey of white-collar employees in multi-national companies indicated that the vast majority of these employees have encountered challenges in virtual work, but only 16% had had any training at all to prepare them.⁵ Such challenges include:

Cultural Differences: Many engineers are not prepared with information about the varying perspectives that different cultures have on fundamental issues like: effective communication; time and planning; hierarchy; the role of the individual and the group; tolerance for uncertainty; display of emotions at work; approach to conflict; decision-making, etc. They can experience these differences in a Global Work Team, but not even have a mental construct to make sense of them. Without understanding, individuals often experience these differences as “wrong.” Once someone is judged as wrong, or uncooperative – we enter the downward spiral of misunderstanding and mistrust. Nothing unravels a Global Work Team faster than the breakdown of trust.

Virtual Communication: Much of the speed and agility of a Global Work Team comes from use of communication technologies. But many such tools do not provide the contextual clues that are part of a full communication experience. Email, for example, often eliminates every bit of context and comes down to words on a page. The result is often a distinct gap between the

intention of the writer and the impact on the receiver. When combined with the cultural differences mentioned above, Global Work Teams can experience severe communication breakdowns.

Virtual Meetings: An aspect of the new “sociology of work” mentioned above, virtual meetings are viewed as a new tool that can be very efficient and effective. In reality, virtual meetings often fall short of this ideal. If we could be a “fly on the wall” and see all the participants of a virtual meeting, many would be multi-tasking, bored, or rolling their eyes.

Leadership Challenges: Another aspect of the new sociology of work is that Global Work Teams require a new kind of leadership. The old “command and control” approach can break down across distance and culture. Leaders must guide the work of their teams using their influence and inspiration, while ensuring clear-cut and shared views of mission, roles, strategies, and tactics. People who are successful leaders in monocultural and face-to-face environments are not necessarily successful at leading Global Work Teams. New leadership models are emerging.

CAN WE PREPARE ENGINEERS FOR THIS?

My answer to this question is a resounding “Yes!” I have effectively worked with engineers on these issues, for example a seminar for the UCLA Extension to teams of General Motors Engineers around the world. I also teach this content as a Module in the ELITE Management Development Program of the University of Tulsa to oil and gas engineers each year. And I have done coaching and training to engineers in many companies. The challenge I find is that before the training or coaching, many wonder about the nature of the topic, and if it merits their time. It doesn’t sound very technical! After the training, though, they come away convinced of the value and importance of this content- and typically advocate for others to be exposed to the same information. As we know, engineers are problem-solvers. Those who have worked on Global Work Teams have experienced some of these challenges, and are interested to know that there is knowledge and skills that can be brought to bear. Awareness of these approaches makes these teams function more effectively and can unleash their enormous creative potential.

In my work, I have developed a training / coaching model that looks at the elements required for successful Global Work Teams. This model considers cultural factors, virtual factors, and the critical importance of leadership and trust-building. There are, indeed, concrete things to be learned and applied in all of these areas. Based on the work of WorldWork Limited of London, for example, competencies for success in cross-cultural environments have been identified and can be assessed and developed.⁶ The training also draws on the research of such thought-leaders as Trompenaars, Hampden-Turner⁷ and Hofstede⁸ in identifying cultural orientations and preferences around key variables. An understanding of these orientations helps engineers to identify them in action and to develop a conceptual basis to unlock the meaning of enigmatic cultural behavior. Such understanding can help diminish ethnocentrism, the notion that one’s own culture is superior to others. *“Engineers may be susceptible to a particular form of ethnocentrism: the assumption that if their country is more*

*technologically advanced, their culture must be superior.*⁹ And, perhaps even most importantly, such insights provide a mirror to help engineers understand their own culturally-motivated behaviors and how they may be perceived by others. Other relevant topics that we cover with engineers include: Developing an Intercultural Mindset; Using International English; Writing Email across Cultures; Conducting Effective Virtual Meetings; Establishing Predictable Communication Patterns; and The Ambassadorial Leader.¹⁰

Are we addressing “soft content?” In my view, “soft” is a mistaken and unfortunate term for these elements of engineering education. Projects typically fail due to “people problems.” I recently interviewed a seasoned Engineering Manager, who observed: “In my career, I have very rarely seen an engineer fired for lack of technical skill. Those that do get fired are let go because they can’t work effectively with others.”¹¹ In such cases, people problems are not very soft at all. They can lead to very real and “hard” consequences.

RECOMMENDATIONS

There are many creative projects already underway to explore how we can better prepare engineers for the new professional reality of Global Work Teams. But there is much more work to be done. For example:

- **Recognize the Value of this Content:** Professional engineers and faculty members can recognize the critical importance of this content for themselves, their colleagues, and their students - and not classify it as “soft skills.” Professional organizations and accrediting groups can champion the teaching of global team skills as integral to successful engineering practice.
- **Create Virtual / Cross-Cultural Team Activities Across Universities:** Many organizations are using Global Work Teams for product design and development; short-term projects, problem solving, and a host of functional activities that support their work. Creating Global Work Teams in the university setting can mirror this real phenomenon that students will encounter in the workplace. Universities, for example, can cooperate around the formation of cross-cultural, virtual teams to complete capstone projects. Global teams can be integrated into existing design or project courses. Such teams should be educated not only in the engineering skills they will need to complete the project, but in the Global Work Team skills that will support this work. Outcomes should include reflection not only on the technical assignment, but also on the impact of working virtually and across cultures. A number of project courses along these lines have been launched. Some examples as cited in the paper: *Global Virtual Teams: A New Frontier for Capstone Design*” by Parkinson et al.¹²
 - Purdue University students teamed with Lucerne University students to enter the “Darwin21” design competition to develop a robotic device capable of displaying five different types of emotions

- The University of Detroit and the Federal University of Minas Gerais in Brazil matched students to complete a controls systems design project
- Penn State University and Corvinus University of Budapest run an international design and entrepreneurship course
- Penn State and members of the Latin American and Caribbean Consortium of Engineering Institutions launched a joint effort focused on collaborative design projects through the conceptual design phase; an example project is developing portable housing for refugees
- Rice University in Texas implemented a course called “iDesign,” which involves pairing students from Houston, Paris, Tokyo, and Abu Dhabi on projects involving oil well inspection and monitoring equipment
- Virginia Tech and Tec de Monterrey in Mexico have collaborated on a two-semester senior capstone design project; one such project involved designing a vehicle for young professional women in Mexico City

For additional examples of multi-university cooperation, refer to the Parkinson paper cited above and in the bibliography.

- **Offer Seminars and “Backpack” Courses:** Surrounding such project courses, or even independent of them, universities can implement course work on Global Work Teams. For example, Brigham Young University in the United States, offers a “Backpack Course” concurrent with a design course featuring Global Work Team skills. The Backpack Course meets once a week and covers critical topics in a “just-in-time” approach. This approach can complement the faculty member’s technical skills and enhance the student experience. Another model is to build a required seminar, or even semester-length course, into the design of a graduate or undergraduate program so that students are exposed to this content and can apply it across the board in their courses.
- **Create Continuing Engineering Education Programs (CEE) in Global Team Content:** Practicing engineers who are experiencing the challenges of Global Work Teams may well be the audience that is quickest to recognize the value of this content. The University of Tulsa in the US has a CEE program known as ELITE – Executive Leadership Institute for Technical Professionals and Engineers, which features a Module on Global Work Teams and cross-cultural communication issues that is very well-received by its students. Other universities have offered non-credit workshops in this content, which can serve professionals in the workplace as well as university faculty and staff. Given the increasing importance of global skills for success in today’s world, Certificate Programs are also an emerging opportunity. CEE programs—because they are flexible and not overly bound by rigid structures and requirements—can be excellent vehicles

for launching and refining this content. Such endeavors also provide a fertile ground for university-industry partnerships designed to address the real-world challenges engineers are facing in Global Work Teams.

As engineering educators, we must build awareness of the importance of the skills needed for success in Global Work Teams. It is a workplace phenomenon that has overtaken us while we weren't exactly looking – and that now is a very significant factor for success in today's international organizations. As Marcel Proust said: "The voyage of discovery lies not in finding new landscapes, but in having new eyes." We must consider how we can give "new eyes" to our engineers, which will result in more personal satisfaction, compassionate understanding, and successful work.

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