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Empowering Celebrations: Promotion and Prizes for Women in Engineering

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ABSTRACT

Women engineers in both academic and non-academic realms often do not promote themselves & simultaneously connect with advocates that could garner awards celebrating their achievements. This absence of self-promotion is also true in the pursuit of career promotion; this paper will focus on the awards component; which can serve as a mechanism for recognition and result in positive career progression. Focus on identifying career development opportunities (e.g., awards, positions) in your particular field to strategically "go-after". Aligning advocates and systems can catalyze your actions and activities to insure successful recognition and empower you as your career progresses. While there are nuances in culture and infrastructure associated with different countries, the identification of awards, prizes and promotions aligned with your career trajectory is critical for leadership and career achievement.

Keywords: promotion, awards, female, empowerment, engineers

1. INTRODUCTION

1.1 WHERE ARE ALL OF THE CELEBRATED WOMEN ENGINEERS?

"Ninguna ciencia, en cuanto a ciencia, engaña, el engaño está en quien no la sabe."
"No science, in itself, misleads. Error resides in who ignores it."
de Cervantes Saavedra Miguel

Accomplishment is in the eyes of the beholder and in the world of engineering, accomplishment and success is often viewed through several different lenses. Scholarly technical accomplishments are often measured by publications, presentations and the impact of the implementation of technology to address critical global issues. Impact on the field can also be measured in the production of people that also contribute to the engineering enterprise. This human capital productivity is measured in part by the students, mentees, and protégés that an engineer may have influenced or trained over the course of their career. There are also several different awards at various stages in one's career that can be precursors to very large national and international awards. The legacy and impact of the totality of one's career is often recognized by election to an honorific organization or by bestowing the rank of Fellow on an individual engineer by a professional society.

Election to the National Academy of Engineering is known as "the highest honor accorded an engineer." The first woman ever to be elected to the NAE was Lillian Gilbreth in 1965. The next elected were: Grace Hopper in 1973 and Mildred Dresselhaus in 1974. Currently a professor at MIT, Professor Dresselhaus is still actively teaching, researching and providing lectures as a engineering scholar that inspire men and women alike. I had an opportunity to meet her at North Carolina State University in the Spring of 2013 during a lecture. She was an amazing octegenarian and is still actively challenging others to develop technology and human capital. A pioneer

in the field of nanotechnology – she is widely recognized with honorific awards that recognize her science and her unique status as a role model for both women and men.

It is interesting to note that while the number of women in engineering is not aligned with the percentage of women in society overall, the rate of nomination of women into certain honorific organizations is close to the percentage (at least the same order of magnitude) that are selected during a given nomination cycle (see below Table 1). This indicates that the critical aspect of receiving recognition is being nominated in the first place.

Table 1: Nominations Lead to Awards (National Academy, 2006)

TABLE 4-1 Percentage of Women Nominated to an Honorific Society or for a Prestigious Award and the Percentage of Women Nominees Elected or Awarded, 1996-2005

	% Nominated	% Nominees Elected
Society		
American Philosophical Society[a]	14.6	23.7
Mathematical and physical sciences	19.0	24.0
Biological sciences	11.5	23.3
American Academy of Arts and Sciences	N/A	15.8
Mathematical and physical sciences	N/A	11.6
Biological sciences	N/A	20.0
Institute of Medicine[b]	19.2	22.7
National Academy of Engineering	5.3	6.0
Aerospace engineering	3.1	7.1
Bioengineering	6.9	4.6
Chemical engineering	5.9	5.2
Civil engineering	4.1	2.4
Computer science and engineering	11.9	8.6
Electric power and energy systems engineering	3.1	2.3
Electronics engineering	2.8	3.7
Industrial manufacturing and operations systems engineering	4.9	4.3
Materials engineering	5.7	7.8
Mechanical engineering	2.5	5.6
Petroleum mining and geological engineering	9.5	8.7
Special fields and interdisciplinary engineering	5.7	6.3
National Academy of Sciences	12.5	15.6

So how does one get into NAE? Election to the National Academy of Engineering is articulated on their website (www.nae.edu/About/BecomingaMember.aspx)

"Members are elected to NAE membership by their peers (current NAE members). Election to membership is one of the highest professional honors accorded an engineer. Members have distinguished themselves in business and academic management, in technical positions, as university faculty, and as leaders in government and private engineering organizations. Individuals can not apply for membership in the NAE and, thus, there are no "application forms" for membership in the NAE. The procedures for nomination and election of member and foreign associate candidates involve a search in all fields of engineering by present members of the NAE for outstanding engineers with identifiable contributions or accomplishments in one or both of the following categories: (i) Engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature.(ii) Pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education.

There are several other awards that an engineer can acquire over the course of their career and the seemingly small or minor awards build a foundation for the larger seemingly "more prestigious" awards that can be received. A combination of local, regional, national and international awards in one's portfolio requires a robust connection to a professional community that is working to advance the training and credentialing of engineers in their respective fields.

Another way to distinguish yourself as a leader in the engineering field, is to create something that is needed in the field to coalesce ideas and concerns in a particular area. For example, Dr. Lueny Morell, a chemical engineer trained at the University of Puerto Rico– Mayagüez (UPRM) Campus was instrumental in the development of several different organizations focused on technical and educational issues for engineers. Her leadership as an associate dean of engineering at UPRM provided a launching point for her innovations in engineering education; she received the 2006 US National Academy of Engineering Bernard M. Gordon award for innovations in the engineering curriculum and the 2010 Latin America and the Caribbean Consortium of Engineering Institutions Academic Award. *"Lueny was the Founder and Past President of the International Federation of Engineering Education Societies (IFEES http://www.ifees.net/), a co-Founder of the Global Engineering Deans Council (GEDC www.gedcouncil.org) and co-Founder of IIDEA, the International Institute for Developing Engineering Academics (http://www.iideainstitute.org), which aims at providing selected top notch leadership workshops offered by world known educators to engineering professors, deans and graduate students worldwide."*

However, the leadership aspect of Dr. Morell's portfolio only tells part of the story leading up to her professional accolades. Dr. Morell was also a licensed engineer (which means she had to take the certification tests), an IEEE Senior Member (meaning she had to pay several years of society dues *and* be active in the society), and ASEE Fellow (meaning she had to be a consistent dues paying society member). She has also been a member of local, national and international advisory boards including: Cal Poly San Luis Obispo College of Engineering Advisory Board, the Southern States Technology Board (appointed by the PR Secretary of Economic Development) and past member of the Worcester Polytechnic Board of Trustees. This is a great example of her service and her willingness to step outside of the typical engineering box and explore other opportunities to serve while impacting her profession and her community.

Dr. Morell is one example of having the various entities that contribute to an award-winning portfolio that is recognized by peers and deemed worthy of honor. It is also clear that there were clear commitments that she needed to make to her profession to become known and connected to both academic and non-academic communities of practice. The most important concept here is not that one needs to follow the trail blazed, the path walked or the career personified by the women mentioned in this paper. Rather it's important to create one's own roadmap that is aligned with the technical aspects of your career in addition to the areas you are passionate about serving in. A final note on Dr. Morell's career, she provided leadership at a large corporation, she was the director of university relations for Latin America for Hewlett Packard (HP) Company. One of her many responsibilities was to develop and strengthen corporate ties to institutions in Latin America. This demonstrates that diversity in your path is a way to connect with different professional colleagues over the life of your career.

2.0 HOW TO GET THERE FROM WHERE YOU ARE?

> **"Recognition:** Another indicator of scientific productivity, and one especially germane to career advancement, is recognition in the field. Being invited to speak at major professional society meetings is one type of recognition, but women are not well represented among symposium speakers and keynotes." (National Academy, 2006)

Oftentimes the keynote or plenary lectureships are associated with the winning of an actual award by the professional organization. For example, in the American Institute of Chemical Engineers (AIChE), there are several awards that recognize achievement in research, technology, environmental sustainability, teaching and industrially based innovations (see www.aiche.org). The awardees are prominently featured in the annual meeting program book in addition to large photo posters strategically positioned at key locations during the meeting. A number of institutions send out notices to other schools, industries and government entities announcing the awards. This mechanism of featuring accomplishments benefits the institution in addition to

providing exposure to the award recipient. At this stage – the gender of the recipient is less a factor in the public relations due to the accolades that will come back to the institutions of origin in this case. As a recent member of the AIChE national awards committee, I found it important to not only understand the core nomination package, but to also understand the perspectives and credentials associated with the letter writers and nominators. In the academic promotion and tenure process, an institution may require a short bio of the letter writer to calibrate the comments and the person's interactions (and hence their associated knowledge) with the nominee. This required connection with strongly credentialed letter writers requires one to strategically position oneself with the leaders in your field via publications, collaborations, technical leadership or just reaching out to the movers and shakers in your technical field throughout your career.

2.1 START TO DEVELOP STRATEGIES FOR GETTING NOMINATED & POSITIONING YOURSELF FOR SUCCESS..

*"You do not have to be **loud**, talkative, sociable, aggressive, or even **supremely** self-confident to self-promote in the interest of career development." (Scientopia, 2012)*

There are several ways to establish oneself as an award winning leader in the field of engineering. First you should actively prepare for and pursue local, regional, national and international awards. Typically these awards require a combination of nomination letters, letters of support or testimonials, summaries of impact being celebrated by the award and a detailed resume of your accomplishments related to the specific award criteria. There are several things you can do to prepare for a nomination including:

a. Detailed evaluation of previous nominees (and of course the ultimate winners): This will include looking at their website, resume (if publically available online), the papers they have published and the prestige of the journals they are published in. You may also investigate their service to their profession via membership and leadership in professional societies.
b. Connect with someone that has served as an evaluator for that award. Sometimes this information is hard to find – but many organizations list the overall committee members on their website. It is never advisable to ask about specific nominees, or award status prior to announcement of awards in a particular awards cycle, it may be pertinent to ask about common "mistakes" that are seen in award applications.
c. Connect with a previous recipient of the award and ask them to review your resume. You should be sensitive to the fact that they may be on the evaluation committee for the award; this is often an unwritten "rule" for recipients to pay back the honor by participating in the selection of future awardees. If this is the case, it may be inappropriate to get formal feedback from that person. In any event, use your discretion and be ethical in your behavior and approach to the receipt of informal and formal feedback.
d. Identify specific awards that you would like to be considered for and start to cultivate relationships with potential nominators and letter writers. This could be a career-long activity, starting at the beginning of your career. In my case, I established a professional relationship with an editor of a major journal in my area, providing assistance as a reviewer on papers in a timely fashion. As I progressed in my career, he continued to provide insight and critical assessment of my technical portfolio. When it came time to go up for tenure, apply for special grants and be nominated for national awards, I could rest assured that if a letter was requested from him – that he could provide an honest, authentic level of support for my nomination. Leverage mentoring and coaching relationships to build your network of support (Grant, 2006).
e. Self-nominate as appropriate for pre-awards and less prestigious awards. In this case, you can put in your own application for an award, you may need a letter of support – but you can initiate the award. This works well for local and regional awards that may have a limited submission – or actively encourage self-nomination. In the final analysis, when the award is on your resume, it acts as a credentialing agent and

no one will know if you self-nominated or not. After all, the final package still needed to go through an evaluation process.

f. Be willing to nominate others or provide support letters for colleagues at your home institution and in your professional network. Sometimes this aspect of collegiality goes a long way. It establishes you as a team player that is not just out to promote oneself all of the time. Also your promotion of junior colleagues is seen as a mechanism to develop the profession overall. Sometimes those junior colleagues demonstrate their appreciation for your support of their career development (in all arenas, not just in awards) and celebrate you later in your career. I have seen this occur at national meetings that have symposia dedicated to the career of an "icon" in the field. This often takes the form of a major birthday celebration, for example, a session honoring the 75th birthday of a prominent electrical engineer may feature a set of her successful students, co-workers and those impacted by the technology that she provided a leadership role in developing.

2.2 OVERCOMING THE APATHY SURROUNDING YOUR PROMOTIONS & PRIZES PORTFOLIO…

Often you will see a resigned disbelief or a resigned indifference in the promotion of your career credentials for both internal and external awards. When you are successful in garnering awards, some may even tire of celebrating your success. A woman engineering professor and NAE member provides the following supportive statements as you pursue awards and recognition:

- ***Take*** matters into your own hands,
- ***figure out*** good awards for you,
- ***ask people*** to be the front man/woman for you, offering to prepare the materials , and submit many times.
- **Don't give up!!!!**
- Get ***feedback*** on the nomination statement.
- ***Make and keep friends*** wherever you can so that people will feel good about nominating you and writing letters for you.

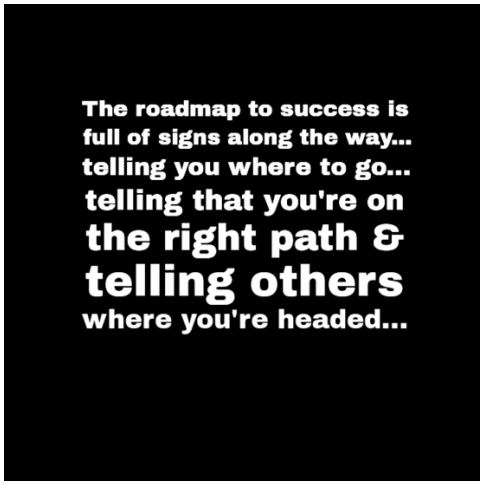

Figure 1: Quote from C. S. Grant (2014)

3.0 FINAL WORDS..

The pursuit of a career in engineering is challenging and rewarding at the same time. The opportunity to impact the human condition on a global scale starts from local technical innovations that propagate into industrial and academic realms of activity.

While this paper does not focus on the composition of award committees or the trends that occur when the committees are more diverse, we will note a few observations from the literature. In a 2013 article entitled, "Maximizing the Potential of Scientists in Japan: Promoting Equal Participation for Women Scientists through Leadership Development" Homma, Motohashi and Ohtsubo collected data on the visibility of female scientists in professional societies. While they studied several Japanese societies, they noted that in the award process, the addition of a female member to the selection committee resulted "*in not only the first, but a successive string of award-winning female scientists."* (Homma et. al., 2013). They concluded that, "Raising consciousness among female scientists is a necessary first step to increasing their proportion in leadership and decision-making positions." (Homma et. al., 2013)

While accolades, awards and prizes are not a requirement for a successful career, when given, they are certainly

Figure 2: Quote from C. S. Grant (2014)

morale boosters. For women in engineering, the low numbers present unique challenges in the areas of bias, discrimination and inequities in compensation and recognition. Excellence, however, is worthy of recognition. Ignoring accomplishments and essentially dis-empowering women in engineering is detrimental to a globally competitive workforce.

You Can take charge of your prize-winning empowering moments; through a series of strategic actions, alliances and activities. Let's get to work, it's nomination time!

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