

Opening Comments for Women in STEM Research Symposium 03/21/17

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Welcome to the Women in STEM Research Symposium, 2017. The third annual event organized by students and faculty to celebrate women's presence in the STEM disciplines is a terrific opportunity for all of us to recognize that women are distributed widely across the STEM fields. We are growing in numbers, but in some fields we still find ourselves isolated among men students and faculty. I want to talk about three things: 1) how to grow the number of women entering STEM; 2) how to keep women in STEM once they reach college and beyond; 3) what are we doing at UTK to improve the success and numbers of women in STEM.

Growing the number of women in STEM means going back to the early years of education and supporting the natural curiosity girls have about the world and encouraging them to engage with it directly. Young girls are equally curious about the details of nature and wanting to know how things work as are boys at ages 2-5. Some of the gender differences in preschooler and very young students may be inborn, but they are magnified by adult reactions, support and expectations. We expect boys to take things apart, breaking them in the process, and ask how things work. We encourage that behavior with puzzles, models and time spent working on those things with them. What about girls – we may give them shape sorters and puzzles as toddlers, but do we persist as they get older. Do we give girls permission to get dirty, to destroy an old appliance, to take the initiative to find out how the world works through exploration? Or do we make a face that they got dirty and tell them to “ask” before engaging in such behavior? Sometimes we are encouraging, but the data tells us that it happens less for girls than boys both at home and in school.

As a society we have become more aware of these issues and data suggest that girls and boys are more similar and teachers encourage them more similarly through elementary school than was once the case. However, sometime between middle school and high school, the leaky pipeline begins. Girls continue to perform well in math classes, the most essential tool for success in STEM, but more begin to report a lack of interest in exploring the world through manipulation and experimentation. It is the same age at which their “looks” become important to others and to themselves – how does it look to get all greasy taking apart a small engine and rebuilding it? How does it seem to others if you ask questions in class about how a chemical reaction happens, how the heart beats or how a rocket is able to leave the earth's orbit? We are socialized to quiet our curiosity because it is not accepted as feminine.

Yet, there is hope – here we sit -- college undergraduates, graduate students and faculty who made it through the socialization process with our interest in STEM intact. Women have proven we can succeed in the work force, in academia, in developing businesses based on science/technology. But it is not easy. We have all experienced, and dare I say, continue to experience on occasion the feeling that we do not quite belong. I believe that the leaky pipeline between undergraduate and graduate school, from graduate school to academia or leadership positions in other places, results from our own inner doubts and the reflection of doubts we see from the world around us. We ask, “can I really have a “normal” relationship with a partner, raise children, engage in life outside my work as other women do who are not involved in STEM?” I have asked myself this question and been asked the question more times than I can say by young women scientists. How do I juggle all these roles, I have been asked? Can I succeed? First – the answer is ‘yes’! Keep in mind that this is a journey. Women over the last 100 years have been continually asking these questions and redefining their expectations of how women

live their lives. While doing so, we are also forcing men to reexamine and adapt as well. Both men and many women resist changes that allow both men and women to live fully realized lives that fully engages in an intellectual/work life that reflects individual passions while having deep relationships within the family structure and all that entails.

So how does this all lead to a leaky pipeline – in part? As women, society holds us to a high level of accountability for the home sphere. Are the children/partner well groomed, well fed and their needs taken care of? Is the home neat and clean? Are people we care about in the community seeing us as appropriately engaged? We judge one another and ‘blame’ women if the family lacks excellence in these spheres. Over the last 30 years, partners have picked up their efforts so we can go off to work, but on average, it is still not full shared. Why? In part, because we women internalize the cultural expectations of what perfect looks like and that we are responsible for that within our sphere. Honestly, as a biologist, I have to say that some of that is probably adaptive on the child front since women invest more heavily biologically in child production – so we take more responsibility and are often unwilling to give any up to others! But we can and we should. This leads to leakiness in the pipeline as each of us works out how we are going to manage our lives and remain active scientists. It has meant women must give up some control over details in the home sphere, allowing partners to have more control and engagement, while partners need to be ready to similarly engage. When someone wants to meet those societal expectations, we also struggle with meeting the expectations in our work, and then some of us leave higher level education or careers behind.

We have to help each other. Remember – being in a STEM field and raising a family or “having a life” should be no more difficult for you, on average, than it is for men. And, to be clear, it is not easy for anyone! You will be very, very busy if you are going to be successful in your careers and in your homes. But it is amazingly satisfying. So decide that agenda is possible in your personal life, and support and encourage your “sisters” to believe that we all can find balance in our roles. I often describe life as a juggling exercise. Sometimes everything is going well, sometimes one ball or another gets longer attention, then your move on. Balance is in the long-run, not every day!

Ok, so that is the part that is about our own inner dialogue which is driven both by our own nature to some extent, and by societal expectations. What about those issues of working in environments that are unfriendly, dare I say hostile? When you are one of a few women in a group and the “guys” are saying rude things about women? When they talk over you, ignore your ideas, call you names when you insist on being heard, actually say that women should not be present, are not as good, or are a token? You have a couple of choices: ignore it, call it out, come to Women in STEM meetings and get support that, yes, these things are happening to you. Work to inform the men in your lives about these issues, they will become advocates for other women and you. I hear it from my son and his friends, my husband and his friends – they do get it and as more men “get it”, things get better. Also, simply getting a greater number of women into your field, your lab, your workplace creates a different working environment and set of conversations. You can be an activist in a variety of ways, but most importantly you have to keep reminding yourself that you ARE A SCIENTIST AND DO BELONG IN STEM!

Finally, I was asked to mention what UT is doing to help support women in STEM. I can report most effectively on what is happening in my college. We have successfully increased the number of women faculty in STEM and the number of women in leadership positions through active programs. All search committees must have STRIDE training to learn to avoid bias in reading resumes and letters of recommendation, to set the same standards of expectations for

all candidates. We participate in the Future Faculty program through which we bring to campus potential UT faculty who are underrepresented within their field. We set aside faculty lines for departments to use to target hiring an underrepresented faculty member in their field. These efforts have led to an increase in the number of women (and minorities) in our ranks. Now we are working on providing additional support. We have a mentoring support system called mentoring matrix that brings together women across disciplines and ranks in small groups for regular interactions and self-support in a social situation. More is needed, and this organization, Women in STEM, is a great opportunity for women to gain needed support.

We are also working to increase underrepresented graduate students based on the disciplinary challenges by developing recruitment strategies directed at undergraduate institutions that produce women and/or minorities who are well-prepared and interested in STEM. This approach, over time, develops a “pipeline” between institutions, and we are beginning to increase the diversity of our graduate programs.

Our efforts at recruiting undergraduates are less specific. Various departments hold events for families to visit the departments on campus, and most units hold events off campus to which anyone can attend. Very few events are focused specifically on encouraging girls at any age to pursue STEM, although they are certainly present in good numbers at outreach events. Today, within CAS Science and Math disciplines several units have nearly equal numbers of women and men enrolled and graduating. And where there are fewer women, the numbers are growing. We need to keep that process going and bring those women into careers that make use of that STEM training.

Today, I hope you will enjoy hearing about the passions of some of your speakers, make friends, and absorb the fact that women belong in STEM. We are not going away, the STEM fields are better with our ideas and hard work. Remember -- YOU can succeed in a STEM career and life!