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Strength in Numbers

Laura Wright
Furman University

Angela Walker Franklin

Valerie Horsley

Luanne McNulty

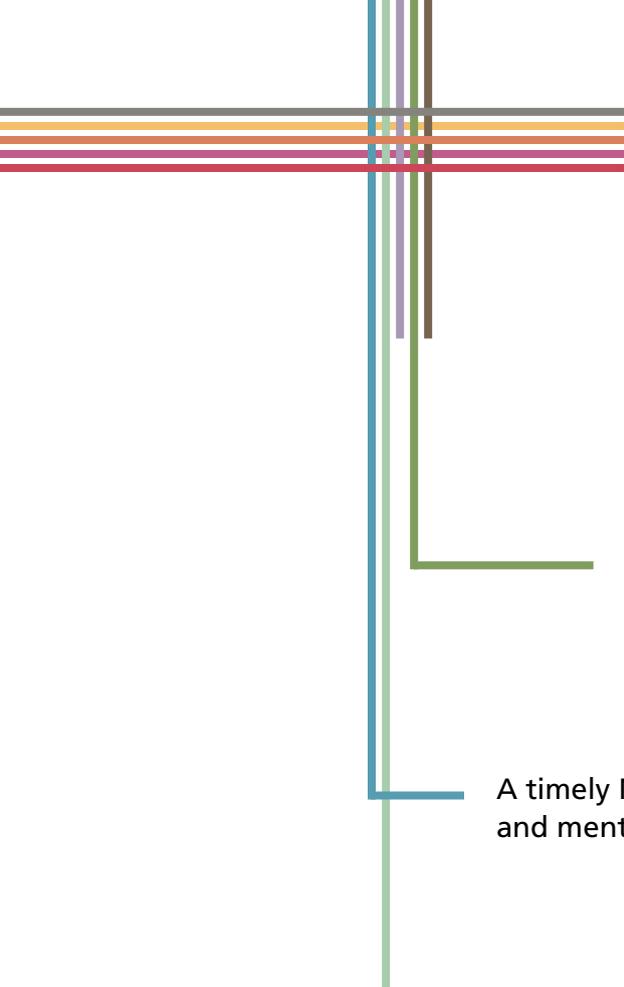
Angela Buzzett Shiflet

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Strength in Numbers

A timely NSF grant helps women scientists discover the value of networking and mentoring to their careers — and their lives.

AT VARIOUS POINTS IN YOUR CAREER YOU may find that you need to ask someone how best to proceed. The questions may be about job expectations, project management, personnel problems, or how to obtain necessary resources.

When you start a new job you face many unknowns, and having someone to provide guidance or advice is critical to success. In many instances a formal mentoring system can help, but often informal interactions between colleagues provide even greater insights into how an organization works and how to progress in that organization.

As your career advances, if you are fortunate, you find colleagues with whom you can talk freely about any topic — people who have similar backgrounds and interests and talk the same language that you do.

In my case those colleagues turned out to be a group of four other women chemists scattered across the country.

In 2004 Kerry Karukstis, a chemist from Harvey Mudd College in California, asked if I would like to be part of a career development initiative to be sponsored by the Andrew W. Mellon Foundation. The project would focus on providing opportunities and resources for women chemists at liberal arts institutions to explore the next phase of their careers

and determine how they could contribute the most to their institutions.

Surprisingly, only five of us in the targeted Mellon cluster of eight colleges had achieved the rank of professor, and several of us were still the only woman ever in a tenured or tenure track position in our departments. In most cases we were the first women faculty hired at our institutions in departments with few, if any, female role models.

I agreed to participate. But I could hardly have anticipated that suddenly I would have access to the most amazing resources of my academic life.

As the members of our group became acquainted, we began to reflect on our careers — past, present and future. Working with a career counselor, we began to develop goals based on our individual strengths, and to establish steps to achieve these goals.

One of the most valuable aspects of the Mellon project has been the opportunity to sit and talk with women chemists about issues that each of us have faced in our professional and personal lives, such as sexism, equal pay, and balancing work and family. Having a group with whom to share opinions and ideas has made our professional lives more rewarding.

BY LAURA WRIGHT

Because we now know each other so well, we can recognize when someone is about to pass up an opportunity that is a perfect match for her abilities — or commit to a project that does not fit her career aspirations or personal interests. We serve as an informal check and balance system for each other.

It didn't take long for us to realize that women scientists at other liberal arts colleges could benefit from similar opportunities. Four of us decided to submit a proposal to the National Science Foundation's ADVANCE Program that would allow us to further explore how our mentoring project could be adapted for others. When word came that we had received \$500,000 to support our proposal, we were ecstatic — and a bit awed by the responsibility to investigate whether our model would work with other women at similar stages in their careers.

THE UNDERLYING GOAL OF OUR ONGOING

project is to promote the advancement of senior women science faculty at liberal arts institutions to the highest ranks of academic leadership. Five-member mentoring alliances, representing institutions across the country, engage in discussions and workshops about career and leadership development.

While there have been many studies of the needs of women scientists at research institutions, no studies have focused on the environment they face in the liberal arts setting. The NSF was interested in evaluating our group's strategy, as well as in seeing whether it would be of value in disciplines other than chemistry. With this in mind, we established three new alliances, two comprised of chemists and one of physicists. These alliances are working to enhance the leadership, visibility and recognition of the participating faculty members.

We are now completing the third year of the NSF project, and its impact is evident.

One woman, seeking an opportunity to use her leadership and administrative skills, accepted her colleagues' nomination and subsequent invitation from her institution to serve as department chair. A second gained the confidence to write a research proposal that was funded by the NSF. Another raised the intensity, scope and visibility of her contributions to a national professional organization to the point that she was elected the group's president.

Two participants recently were appointed to endowed chairs in their departments; one was the first woman to be awarded an endowed chair in her institution's science division. Another woman received a prestigious endowed research chair at her university, and yet another was named Professor of the Year for her state.

These women used the professional skills they had identified during our project's workshops to increase their visibility on their home campuses. They had always been worthy of these types of awards, but they had just assumed people would know it. Taken individually, each is a major accomplishment in a career. As a group, they show that a network of horizontal mentors who provide support and encouragement can produce positive results.

I presented some of our initial findings at the 2008 Southeast Regional meeting of the American Chemical Society. Many women dropped by to hear about the project and to ask how we had gotten started — and how they could become involved.

The first part of their question was easy to answer; the second, more difficult. The NSF grant supports only the initial group of 20 participants. Judging by the number of women who expressed interest, it is clear that many need guidance on how to advance their careers. And it isn't just women at liberal arts schools. I spoke with women at large state universities and at technical colleges, all of whom would benefit from access to an alliance.

The most unexpected encounter I had came toward the end of my presentation. A man had been standing in the background listening as I talked with two women. When we finished, he stepped forward and began to describe his own informal alliance.

A number of years earlier, he said, he had developed health problems that precluded him from continuing to direct a traditional graduate research lab at his university. He had looked around for a new way to contribute to the discipline and realized that he could do research in chemical education pedagogy. Although no one on his campus focused on the same area, he was able to find a group of four chemists doing similar work at other institutions who were also looking for a peer group with which to share ideas and concerns.

As he talked, I realized that any time an individual, man or woman, is working in isolation, there is a need for some type of support network. This man from a major research institution was so excited about our project that he was considering adding a new monthly column to a journal about chemical education to showcase strategies for career development.

Our project has provided a lifeline for senior women scientists at liberal arts colleges. But others, in different disciplines and professions, are seeking the same thing. Our project can perhaps serve as a model for them to emulate.

Being part of a mentoring alliance can become an amazing resource to help you find a better way forward in your career. And you might just end up with some of the best friends of your life!

The author has taught chemistry at Furman since 1983. She received the 2008-09 Alester G. Furman, Jr., and Janie Earle Furman Award for Meritorious Teaching.

On the following pages, four alumnae/academics offer their perspectives on mentoring in their professional journeys.

Finding the right path

I COMMEND THE EFFORTS OF LAURA WRIGHT and her colleagues in establishing the NSF ADVANCE mentoring alliance. Clearly, they recognize the challenges facing women academicians and the need to build avenues of support.

As a fellow woman academician and administrator in higher education, I find considerable relevance in the ongoing, urgent need for guidance for women in general in advancing their careers.

After graduating from Emory University with a Ph.D. in clinical psychology, I initially plotted a career path that would focus primarily on establishing a clinical practice. As fate would have it, my first job offer was as an assistant professor of psychiatry in a small medical school. Although I had not initially planned to pursue a career in academe, I welcomed the opportunity to teach and build a practice through the medical school faculty practice plan.

One advantage of being in a small institution was the ability to quickly demonstrate competence. Without any plan, or clear guidance, I advanced in my career, but often felt “led” and “defined” by circumstance. I did not have a road map and, to some extent, was simply riding the train wherever it took me.

Looking back, however, I realize I never really planned a particular career path. Perhaps I was lucky and happened to land in the right place at the right time.

Throughout my career, I have found that many women struggle to find a clear plan or path. They tend to allow others — or circumstances — to “define” what the next step may be.

I was able to take full advantage of all the opportunities presented to me, and the “train” actually led me to a place that I believe I was destined to arrive. Now, as a full professor and executive vice president and provost at Meharry Medical College in Nashville, Tenn., I can truly say that I am headed in the right direction.

My path has been a bit unique, given the type of institutions I have served, and I still sometimes reflect on a phrase I often used with my children: “Mama doesn’t know what she wants to be when she grows up.”

The NSF ADVANCE program resonates with me in that I rarely had the benefit of like-minded, similarly destined individuals with whom to share stories.

There were often times that I longed to consult with someone who would understand my frustrations, my challenges and my desire to find purpose. At all levels there is a need for camaraderie, and we should all do more to help, advise, support and push each other forward.

Whereas there are many workshops, fellowships and academies to “train” and direct individuals toward a particular career direction, these opportunities sometimes fall short in providing follow-up and guidance. A well-defined mentoring alliance clearly provides a targeted effort to assist and guide for the long term.

Given my own experiences, I now wish to help other women who are looking for guidance and purpose. Perhaps it is my training as a psychologist, or my genuine desire to give back. Regardless, there is a need for building alliances, identifying and selecting advisors and mentors, and sharing stories that may help another person find purpose.

Everyone faces challenges in advancing their careers, but it surely can make the walk more pleasant if there is someone to join you along the way. Therefore, I fully support the idea of a mentoring alliance and applaud the



efforts of Laura Wright and her colleagues in providing a resource for women in the sciences.

We should all learn from this and strive to create opportunities for women in other disciplines, emulating the model that has now been established.

— ANGELA WALKER FRANKLIN

The author, a member of Furman’s board of trustees, earned her degree in psychology in 1981. She was for many years a professor and administrator at Morehouse School of Medicine in Atlanta before moving to Meharry.

Staying on track

ONE OF THE MOST TRANSFORMATIVE

experiences of my career came during three workshops that I attended in the spring of 2005, while I was pursuing my postdoctoral fellowship at Rockefeller University in New York City.

The workshops were titled “Making Sure That Academia Includes You: A Career-Building Workshop for Women in Science.” For three Saturday mornings, women from multiple academic ranks — graduate students to junior faculty members — and from diverse scientific disciplines gathered to learn about coping and advancing within male-dominated academia. The workshops, sponsored by the Gender Equity Project at Hunter College of the City University of New York and by the New York Academy of Sciences’ Women Investigator Network, were intended to help increase productivity and the likelihood of women receiving tenure and promotion.

The first session, “Gender and Basic Foundations,” uncovered one of the defining lessons that I took from the program: the need to build and maintain a circle of advisors.

During this session, we did an exercise where we listed areas in which we needed mentoring and advice. As a postdoctoral fellow, I listed such things as scientific direction, writing papers and grants, technical help in the laboratory, and networking in my field. After developing our lists, we then identified individuals who could help us in these areas. I included a few of my postdoctoral colleagues, my husband (who is also a scientist), and my current postdoctoral advisor, each beside a different need.

Through this exercise, I immediately realized that one single person could not — and cannot — provide advice for every aspect of my career. Each person on my list had certain abilities (and time) to advise me in specific areas.

During my days as a biology major at Furman, I had one advisor, Joe Pollard, who helped me develop my class schedule and assisted me in choosing a graduate school. When I began as a graduate student at Emory University in cell and developmental biology, I joined the laboratory of Grace Pavlath to study muscle development.

The graduate student-mentor relationship resembles your relationship with your parents, where you learn about multiple aspects of scientific training and career development. A scientific committee directed my progress in the laboratory, and I garnished additional career advice through interactions with other faculty members. However, these relationships tended to be casual and informal, as opposed to the ongoing, organized relationships that the Women Investigator Network workshops promoted.

When I joined the faculty of Yale University earlier this year as an assistant professor, the lessons from those workshops suddenly came flooding back to me.



Faced with many new decisions and responsibilities — teaching undergraduates, hiring and managing technicians, students and postdoctoral fellows, organizing a laboratory — I remembered the list of mentors I had generated during the workshop. I immediately began writing down the aspects of my new job where I needed advice.

Once I began to make my list, I realized that I had a network of individuals who could help me work through these new responsibilities. Some of them were a part of my formal mentoring committee in my department, but others were colleagues from outside the department and from other institutions.

Each week, one of my former postdoctoral colleagues and I have an informal video conference where we discuss what we do — science — and how we do it — managing our new jobs as assistant professors. It is these kinds of interactions that will help keep me on track in academia, in keeping with the focus and the intent of the NSF ADVANCE project.

— VALERIE HORSLEY

A 1998 Furman graduate, the author earned her Ph.D. from Emory University. Her specialties are molecular, cell and developmental biology.

WHEN I WAS A CHEMISTRY MAJOR AT

Furman, Laura Wright was the only woman professor in the department. I never thought much about being a woman in chemistry, perhaps because Laura was there or perhaps because the faculty in the department seemed to care only about whether you loved chemistry, not about your gender.

I did not realize how rare it was for her to be the sole tenured woman until I was in graduate school. But knowing that there was at least one female chemistry professor out there provided proof that it was possible for me to be a chemist, too.

Laura was my first mentor and first role model, the first female working chemist that I knew. At the time, in the early 1990s, it was insignificant that she was a faculty member. She was a woman in chemistry.

I met other women in graduate school, but they were mostly graduate students, not chemistry professors. Soon I began to understand the

Building on mutual respect

rarity of women in the academic ranks in chemistry.

My mentors in graduate school were men and women. My advisor and my colleagues provided me with job training. My colleagues offered much needed support. They were also friends. We respected each other as we worked toward the same goal — enough research to allow us to move to the next phases of our careers.

Graduate school was a heady time for a self-professed geek. Every day was a new opportunity to learn. When things would go well, my fellow graduate students would offer praise; when things went south, they provided much needed commiseration. And I did the same for them.

When I left graduate school, I realized how valuable a support group my lab mates had been. My first academic job was at a brand new college — Harriet L. Wilkes Honors College of Florida Atlantic University — which did not have most of the infrastructure you take for granted at an established institution like Furman. I yearned for the collegiality, the solidarity and the joy of being surrounded by people who understand where you are going and what you need to do to get there.

At the time, I did not have anyone close by to offer the support I desperately needed. Laura Wright helped me make a valuable contact — her sister Amy, who is currently the director of the Center for Marine Biomedical and Biotechnology Research at the Harbor Branch Oceanographic Institute of Florida Atlantic University. In subsequent years, Laura has

provided me with much needed advice on how to handle sticky issues. Her support has been invaluable.

Now, as a tenured professor at Butler University, I still have mentors. Some are colleagues and some are former associates. Some are men, some women. They all supply a much needed support network. But, in some ways, the women offer an additional level of support. They understand the challenge of childbearing (especially as a synthetic chemist), the difficult balance of family and work, and the isolation of women in science in academia.

When I think about the cohort that Laura has joined as part of her NSF grant, I realize she has found a group of people much like my friends from graduate school. This cohort is built upon mutual respect. They are friends, cheerleaders, critics and sounding boards. Her group provides the truthfulness needed from a mentor, with a healthy dose of good will to keep everyone going. Most importantly, her group is cooperative. They mentor each other.

I do not know how my career will continue to evolve. But I would like to believe that I will have help along the way. If it is possible for Laura and her group to find each other, then it should be possible for others, including myself.

— LUANNE McNULTY

Having earned her degree from Furman in 1993, the author has taught at Butler since 2003. She holds a Ph.D. from the University of Virginia.



Empowering others

JUST IMAGINE! IMAGINE WHAT AN

undergraduate can achieve! Imagine what an undergraduate can become!

Just imagine! Amanda, a biology major, using statistics and databases, analyzed the relationship between diet and birth defects during a summer internship at a genetics center and presented her research at a national conference. After a year-long fellowship at the National Institutes of Health, she pursued doctoral studies of genetic associations with obesity.

Just imagine! David, a double major in computer science and mathematics, helped develop software for the science operations interface of Mars Rovers at the Jet Propulsion Laboratory in California. In part because of this research, he was awarded a National Science Foundation Fellowship to study computer graphics in a doctoral program at Columbia University.

Just imagine! Diana, a double major in computer science and Spanish, was an intern at Lawrence Livermore and Los Alamos National Laboratories. After completing a master's degree, she returned to Los Alamos to work in the International Space and Response Division — and to run her own Web design company.

Just imagine! Lena, a biology major, interned with the Cardiac Mechanics Research Group at the University of California-San Diego. Her work on optimization of large-scale computations in electrophysiology helped to change the direction of the group's research. She is now attending medical school.

Just imagine! Frank, a double major in physics and mathematics, completed two internships at the Jet Propulsion Laboratory (JPL). He developed software to access images of specific moving objects from JPL's extensive observational archive. The breakthrough resulted in the naming of an asteroid in his honor. Since completing his Ph.D., Frank

has done research at the Johns Hopkins University Applied Physics Laboratory.

These stories of undergraduates I have taught and mentored bring a rush of memories: encouraging, reassuring and sometimes prodding those who do not know their own capabilities; contacting scientists to ask that they mentor the students; sharing their joy at obtaining positions; helping them gain funding; arranging presentations on their research; encouraging them to network with others; celebrating their acceptances for post-graduate opportunities; and hearing stories of exciting work that would not have been possible without their internships and their education.

Small liberal arts colleges such as Furman and my institution, Wofford College, foster this kind of mentoring between faculty and students. The education that Wofford has provided these students is in a revolutionary new academic discipline, computational science, which is at the intersection of computer science, mathematics and the traditional sciences.

Much important scientific research today involves computation as well as theory and experiment. Realizing this, I have had the joy of being present at the formation of one of the first undergraduate programs in this field (Wofford's Emphasis in Computational Science). I have helped others develop programs, written educational materials for such programs, and collaborated with others to advance education in this new area.

Collaboration has been most rewarding with my husband, George Shiflet, chair of the biology department at Wofford. Little did we know when we sat together in calculus class at Furman that we were forming a career path as well as a close relationship!

Sharing a passion for learning and for helping others to learn, George and I wrote the first textbook designed specifically for an introductory course in computational science and engineering.



Introduction to Computational Science: Modeling and Simulation for the Sciences was published in 2006 by Princeton University Press.

As partners and colleagues, we have experienced the excitement of learning new things, making connections among disciplines that have often been too isolated, helping others develop their own computational science programs and, in particular, empowering undergraduates to participate in a revolutionary new field — and imagining what they can achieve.

— ANGELA BUZZETT SHIFLET

The author earned her doctorate from Vanderbilt University. She is the Larry H. McCalla Professor of Mathematics and Computer Science at Wofford.