Recognition of Women's Psychological Development in Engineering Education

Desmond F. Lawler
Environmental and Water Resources Engineering Program
Department of Civil Engineering
University of Texas at Austin

The role of an educator is to be both intellectually challenging to and personally supportive of students. The statement applies to all levels of education, although the degree of challenge and the degree of support vary at different levels. Those of us teaching in engineering tend to focus on the intellectual challenge part of our role and rarely focus on the support that students reasonably expect us to provide. Further, most of us in academia are good at generalizing the theorizing, but it seems likely that we generalize too much from our own individual experiences in the educational system. It is likely that many of our students are different from us in important ways (although we clearly also share many similarities). One important difference is gender; all of us teach (some) students of the opposite gender. Understanding the ramifications of that difference is valuable. The purpose of this paper is to investigate some areas of psychological and developmental theory (i.e., to listen to voices of people who have generalized in those fields) and attempt to apply them to a philosophy of education in environmental and water resources engineering. In particular, some aspects of women's psychological development are investigated. These thoughts might make us re-evaluate the intellectual challenges and personal support we provide students.

Theory of Women's Psychological Development and Opportunities for Environmental and Water Resources Engineering

The percentage of women entering environmental and water resources engineering is generally higher than it has been in the past and also generally higher than in other fields of engineering. In our graduate program at the University of Texas, for example, 30% (11 of 37) of the students beginning the graduate program this fall are female; that percentage has risen gradually from less than 20% a decade ago. Most of us think of these trends as positive for our field. However, if we are to take advantage of these positive trends and continue them into the future, we likely will need to make a significant effort in understanding and using developments in the psychology of women.

A dramatic advance in this understanding came from Gilligan's theory of psychological development, set forth primarily in her book, In a Different Voice (Gilligan, 1982). It must first be noted that the book does not divide psychological development absolutely along gender lines, but notes that, predominantly, men and women develop and learn in different patterns. We might think of this as overlapping curves on a spectrum reflecting ways of thinking, acting, speaking, etc., but these curves have recognizably different means for men and women. No simple test based on Gilligan's theory that could allow us to test for "statistically significant" differences yet exists, but her theory has gained wide acceptance, especially among those who have emphasized the study of women. In what follows, the terms "male" and "female" or "men" and "women" are used to note these differences, but it is recognized that the differences do not follow gender lines in every case and that each of us, regardless of gender, has some of the tendencies of both. Nevertheless, the distinctions are valuable. Before Gilligan's work, the dominant theories of psychological development had been set forth not only primarily by male psychologists but had been based on studies using primarily male subjects. The voices of women and their experiences as women thus had been excluded in understanding human development.

Perhaps the key difference between the male tendency and the female tendency, according to Gilligan, is expressed in two words: separation and connection. Males tend to develop by, think about, and be rewarded for separation; females tend to develop by and think about making connections. These differences in the approach to learning and to decision-making are generally unrecognized in all of society, but, in male-dominated fields like engineering, the problem is acute.

Separation and connection form a spectrum; opportunities to observe ourselves and others on that spectrum abound in our daily professional lives. In a seminar discussion of a paper or certain experimental results, for example, one student might propose a certain interpretation. Two other students, one male and one female who fit the "means" on Gilligan's scale, might have very similar thoughts in response, but their stated responses might sound quite different. The male would tend to state what he disagreed with in the first student's interpretation and ignore areas of agreement; he might revel in the disagreement, the intellectual competition, the separation. The female would tend to state what she agreed with in the first student's interpretation and be more tentative in stating the disagreement; she would try to connect herself with the first student. We might ask ourselves how we respond to and reward these two students.
Based differences are real, recognizable, and valuable to engineering is an important backdrop for what we can accomplish in our programs. Creating a more supportive environment for students will enhance the education we provide. Students will be more productive during their tenure in our programs, become better engineers in practice, and probably be more likely to recommend our programs to others. We as faculty will also benefit by such changes in several ways, including, perhaps ironically, the ability to be more intellectually challenging. While these changes are likely to have a more dramatic effect on women than men in our programs, all will benefit. The point here is not to propose the replacement of a male paradigm with a female one, but to suggest that a fully human one will recognize aspects of both paradigms and create a better environment for the education of all students.

References


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Author Tagline.

Desmond F. Lawler is a Professor in the Environmental and Water Resources Engineering program within the Department of Civil Engineering, University of Texas, Austin, TX 78712.