

# **WOMEN IN TECHNOLOGY: INCREASING THE NUMBER OF FEMALE TEACHERS AND STUDENTS**

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## **Introduction**

Technology Education is a secondary school curriculum that evolved from Industrial Arts. With a new emphasis on technological literacy for all and creative problem solving, Technology Education is a major force for pre-college pre-engineering education.

Like its predecessor, Technology Education continues to have disproportionately low numbers of female students, female teachers, and female teacher educators. Women who made the decision to be technology teachers, or to be otherwise professionally associated with technology education, are in a unique position to offer insight into barriers to increased female participation, and strategies to overcome those barriers.

## **Method**

In May, 1994, a survey was mailed to all professional and student members of the International Technology Education Association (ITEA) who indicated "female" on their membership application. Female technology teachers and technology education college majors in Virginia were also sent the survey. 184 completed surveys (49%) were returned.

Because the survey sample was self-selected, caution must be taken in generalizing responses to the population. Instead, this survey was intended to be a vehicle through which women's voices could be heard.

## **Results**

### **Becoming a technology teacher**

When asked, "Who gave you the most support in your decision to become a technology teacher?", respondents listed a variety of individuals. These were later categorized; the five categories with the greatest number of responses were:

college professors and advisors (56 respondents); parents (33); technology teachers (17); spouse (15); and myself (9).

In a similar item, respondents were given a list of 25 individuals and asked to rate the overall negative (-2) or positive (+2) influence individuals in that category had on the decision to become a technology teacher, using a 5-point

Individual	Mean	Sum	Pct. Negative
College professors in Tech. Ed.	1.39	217	4.6%
Friends	1.12	171	3.5%
Mother	0.96	149	3.1%
Father	0.88	135	9.6%
College advisors	0.86	129	4.9%
Spouse or significant other	0.83	111	4.9%
Graduate students	0.64	95	5.6%
Undergraduate students	0.61	89	7.6%
High school technology teachers	0.58	85	13.7%
Other college professors	0.57	85	11.7%
Co-workers	0.57	82	5.4%
Brother(s)	0.55	78	3.6%
Other family members	0.52	74	7.0%
Sister(s)	0.54	74	2.6%
Supervisor at work	0.51	73	10.8%
Role model	0.53	63	6.8%
Your children	0.44	52	0.0%
Other	0.67	- 49	3.8%
Support group	0.39	48	0.0%
Other middle & HS teachers	0.22	31	29.3%
MS technology teachers	0.20	29	23.6%
Elementary school teachers	0.11	16	31.8%
Female high school students	0.02	3	46.7%
Male high school students	-0.03	-4	54.5%
Guidance counselors	-0.30	-42	75.6%

Table 1. Influence of Individuals on Women Becoming Technology Teachers, Based on a 5-point Scale from -2 (Negative Influence) to +2 (Positive Influence).

Individual	Mean	Sum	Pct. Negative
Your students	1.44	183	3.6%
Fellow technology teachers	1.18	152	10.4%
Friends	1.09	134	1.4%
Fellow teachers (not technology)	1.04	127	7.9%
Mother	1.00	125	5.0%
Spouse or significant other	1.11	125	7.3%
Father	0.89	109	6.5%
School administrator	0.88	108	16.5%
Other family	0.72	82	0.0%
Brother(s)	0.72	81	1.2%
Sister(s)	0.68	76	0.0%
Your children	0.65	68	5.1%
Other	1.03	41	15.9%

Table 2. Influence of Individuals on Women Remaining Technology Teachers, Based on a 5-point Scale from -2 (Negative Influence) to +2 (Positive Influence).

scale. As shown in Table 1, the most positive marks were given to technology education professors, friends, parents, advisors and spouse. Only two groups received more negative marks than positive: male high school students, and (ironically) guidance counselors.

When asked, "Which of the following factors do you feel is/was a significant obstacle to your becoming a technology teacher?", respondents most frequently selected the following five items: little or no technology education in high school (81 respondents); stereotype of male technology education teachers (75); lack of awareness about the field (56); attitudes of male classmates (39); and insufficient college funding (35).

### **Remaining a technology teacher**

Respondents were asked to rate the overall negative or positive influence different individuals had in their remaining technology teachers. Again, the

responses were overwhelmingly positive. Students, fellow technology teachers and friends received the most positive votes (See Table 2.)

Obstacles to remaining a technology teacher were checked off by respondents. "Excessive workload" was cited by 54 women as an obstacle. Others included: not enough professional support (42); greater financial needs (25); and family responsibilities (23).

### **Attracting females into technology teaching**

When asked, "What could be done to attract more females into careers as technology teachers and professors of technology teacher education?", many responses were offered. The following were typical responses:

- "Female role models. Gender free materials."
- "For males not to be so rude in the field. Especially professors."
- "Unbiased presentation of curriculum..."
- "A broader definition of technology and its link between the arts and the sciences."
- "Change the curriculum offerings to be more representative of all aspects of technology in society."
- "More P.R. Posters, seminars, workshops for students and teachers. Better knowledge to counselors. Pamphlets on what's available to women and \$ careers."
- "Provide clean high technology classrooms and laboratories versus 'shops'. Begin at earlier age & increase at ages 9 - 13 to increase self esteem in young women. Offer technology to elementary students (K-12)."
- "Change the attitude that Tech. Ed. is a 'dumping ground' for students. Every misfit is placed in Tech. Ed. because 'We have no other place to put him or her.'"
- "Provide scholarships."
- "Nothing. If they don't enjoy working with their hands, getting a little dirty (which is part of it) it doesn't matter what you do."
- "I don't want to attract girls to Tech Ed in its present forms - there are reasons why they are saying 'No.' - Computerized, pinkified Tech labs don't fool them for long. It is simply Indust. Ed. 'plugged-in' & a little problem solving thrown in."

Suggestions to make it easier for female technology teachers to stay in the technology education profession included the following:

- "Get rid of the 'good old boys' who hire teachers. Create a network to support females."
- "Promote females in leadership positions at the state and international levels. Cater to female interests at conferences."
- "Support groups. Forum / Chances to exchange ideas, problems - to reduce the isolation factor. Mentoring programs."
- "Recognition from male fellow teachers in T.E."
- "Let them be more creative."
- "Educate male technology teachers - males in general, to accept women as equals in the field."
- "Tech. Ed. must change!! The assumptions, beliefs, etc., of Industrial Ed still underlie Tech Ed. Is Tech Ed for students' needs or industry's needs?"
- "The high school labs are still a dumping ground for impossible students. This intimidates many women - New hires are often placed in impossible situations. I know of several women who taught for only a short time & left the field because of impossible situations."

#### **Improving female enrollment in technology education**

Respondents were then asked, "What should be done to improve the enrollment and retention of females in technology education in secondary schools?" Some noted that the answer to this problem was the same as the solution for increasing the number of female technology teachers. Typical response included the following:

- "Have more electives available. Make work (lab) area more neutral: less masculine looking. Female role models or invite females in non-traditional areas in community to speak. Advertise (recruit) as an applied Science & Math, and not 'shop.'"
- "Focus girls on their strong points, i.e., ability to organize, ability to work with a team, ability to concentrate on details."
- "Curriculum development with removal of gender biases. Team teaching to include female faculty in male dominated Tech Ed programs. Involve parents. Start Tech Ed at preschool where values are formed & activities may be gender biased."
- "Have segregated classes - the boys are too rough in middle school and intimidate the girls."
- "More female teachers -- children aspire to what they see."



"Increase awareness of technology classes among females. Bring female middle school or high school students to the university to tour and observe classes."

"Mandatory introductory classes, interesting advanced classes."

### Conclusion

Women involved in technology education are in a unique position to offer insight and suggest strategies regarding gender equity in the field. Their views and experiences are diverse. Overall, they are very positive about teaching technology. However, significant obstacles still remain for many women as they endeavor to become and remain technology teachers. Among these are: lack of exposure to and awareness of the field; stereotypes and sexism; lack of financial and professional support; and a sex-biased technology education curriculum. Sexist attitudes of guidance counselors and males in technology education, including students, teachers and professors, were often cited as obstacles.

Many strategies were suggested by respondents for overcoming those obstacles. They include specific ways to make technology education more "female-friendly" by fighting sexism, changing the curriculum, increasing public relations, recruiting, offering support and recognition, providing financial incentives, and making administrative changes that would make any technology teacher's job more pleasurable and rewarding.

The perceptions and opinions of women in technology education are just one source of suggestions for action. They overlap to some extent with results from other research on education of women in technology, science, engineering, and general and vocational education. However, the views of respondents need no corroboration in the literature to establish their validity.

Equity issues are often related. In some cases, similar strategies may be used to fight both sexism and racism. Promoting gender equity in one environment may have positive impacts on another. For example, by making technology teacher education programs at universities more sensitive to women, their enrollments of females may well increase, resulting in more female role models in middle school and high school technology education classes.

One person's obstacles may not exist for another person; strategies to overcome obstacles may be appropriate for some individuals and inappropriate for others (e.g., not everyone wants a support group.) Generalizations can be inaccurate or misleading. Future efforts should continue to explore technology education in relation to the tremendous variety of individuals. Many of the suggestions made by respondents should be initiated to improve gender equity.