In 1995 five universities in Georgia (Georgia Southern University, the University of Georgia, Georgia Institute of Technology, Georgia State University and Clark Atlanta University) and the AAUW of Georgia received a three year $800,000 National Science Foundation grant for a collaborative project titled Integrating Gender Equity and Reform (InGEAR.) The project investigated educational approaches and ways to increase gender-fair practices in preparing teachers, particularly in the areas of mathematics and sciences. A main objective of the project was to identify ways to make the fields of math and science more attractive to females or identify those issues that discourage females from following a career path in math and science so that they can be avoided. Each university used different methods to address the InGEAR theme.

At Georgia Southern University (GSU) yearlong workshops for faculty and academic support personnel were developed to address different elements of the project. A study was conducted to assess gender equity issues related to professions, salary and advancement nationwide and on campus. A library of research articles, teaching materials and teaching strategies was assembled. During the 1996-97 academic year, the second year of the project, a diverse (age, rank, sex, discipline) group of faculty and staff was selected to participate in six workshops. The workshops covered background material on gender bias in the classroom and laboratory settings, learning styles of women versus men, cultural/social expectations of females and personnel needs for the 21st century. Participants prepared gender based mini-projects based on texts and journal articles in their discipline and presented the results to subgroups of the workshop. One session was a small group hands-on problem solving session to demonstrate learning styles. A website (www2.gasou.edu/ingear) was created by the principal investigators to provide information about the InGEAR project.

During the second year of the InGEAR project each participant conducted a research project on a topic specific to his or her discipline. A small stipend was provided to pay for materials, travel or services. A few of the research topics included: attitudes of high school students toward women in construction, mentors and situated learning, attitudes toward calculators and distance learning, factors in selecting a technical career, women and creativity, sexism in history and improving overall attitudes in the mathematics classroom to name a few. An abstract
of each project was placed on the website. At the end of the year the participants presented their project at an open forum on campus to which all faculty and staff were invited.

This paper presents the results of a survey of female graduates of the civil engineering technology program at GSU. An attempt was made to identify those factors that led the women to this field and the age at which they made their decision. The survey asked about their learning experiences at GSU and solicited suggestions for making the learning atmosphere and ultimately their employment upon graduation more gender equitable. Graduates were asked to relate from a gender equity viewpoint (i.e. their experience(s) in a predominantly male work environment) their experiences in the work place. The full questionnaire is included as the appendix of this paper.

The Civil Engineering Technology program at GSU has graduated over 200 students since its start in 1975. From 1976 to 1996, the scope of this project, 21 women graduated. Most of these women were the only female in their CET classes. Over the past five years there have typically been 18-22 graduates with usually no more than two women in any one class. Women are still rare in CET at GSU. Until just recently these women took jobs in areas or offices that had few if any females in technical positions and almost all of the women had men for their immediate supervisor. Several of the earlier women graduates have progressed to project director positions where they now manage diverse groups of men and women. Most of the women have combined building their career with marriage and having children.

Of the 21 women graduates, two returned to their home country, one could not be located and four chose not to respond to the survey but have maintained contact with the program through graduate surveys. The responses represent a 78% return rate of the surveys mailed out and 67% of the total female graduate pool. Of three who responded that they initially had worked in the civil field, one now works in retail management and the other two have chosen to stay at home with their children. Fifteen are still actively employed in some part of the civil field. Of the fifteen, one opened her own consulting firm, one works in the civil section of a manufacturing company, three are with federal agencies (Corps of Engineers, Forest Service, and Department of Energy) and ten are with the state Department of Transportation. Four are registered professional engineers.

Although this is a small sample and covers graduates over a 20-year period during which many strides have been made in gender awareness in the work place, some insights may be available to help the civil field attract and retain females. Several of the observations and suggestions have pertinence for making the civil field more attractive to women. Many of these items make the field more attractive to male also and are just good teaching and work practices.

One workshop session on learning patterns and interest in math and science suggested that girls begin to lose their interests in these subjects in the middle school years. The CET graduates indicated that they decided to pursue a career in the civil field at the following ages:

<table>
<thead>
<tr>
<th>Age at which decision made</th>
<th>14-16</th>
<th>17-18</th>
<th>19-21</th>
<th>22-25</th>
<th>over 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number making decision</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Another area of interest is how females go about choosing a technical field of study. In addition to asking this question the survey tried to uncover what person or circumstances influenced the choice to enter the civil field. Many of the responses involved liking the outdoors,
enjoying math and science and liking architecture but wanted more technical aspects and wanting flexibility. Several of the respondents hit on areas that more matched ‘female’ qualities such as community impact or the appeal of the graphical and visual aspects of civil projects. Many responded that they chose to study in the civil field based on a family member being in the civil area or relatives suggesting that the civil area might be good for them. A few commented that faculty contacts at GSU had a positive impact on their choice. With so many of the women choosing to study civil in their late teens or 20’s, it appears that middle school counselors or teachers seem to have little or no impact on selecting a career in the civil field. This may be one area worth investigating. Perhaps there is a need for better career guidance information at this level that presents the builds upon those elements of the civil field that prompt women to chose the civil field.

Within the gender equity workshops on learning styles of women, the issue of women being passive and men being aggressive was discussed. Also discussed was the practice of both men and women faculty to call on men more than women, but this was in classes that had a much larger percentage of women in them. These points led to the questions about what was helpful for women or what suggestions could improve the learning environment for women in CET at GSU. Most of the graduates felt that they encountered little or a least no overt gender related problems while in school, but all offered suggestions to improve the learning environment. Many of the graduates spoke of receiving support from faculty and fellow students. Some felt that co-op jobs helped them get a better feel for the subject and build their confidence. The student club activities were mentioned as providing opportunities for the women to be included in activities, as a way to get to know other students and as a way to feel a part of the group. Several felt that it was difficult to get included in study groups and that anything that could be done to help women to be included would be helpful. A club for women in nontraditional fields was suggested, but the comment was made that a separate club or group should be avoided and a mechanism for helping women to blend in would be more constructive. Many expressed concern about lab groups being dominated by one or two men, but then went on to observe that this was true in groups where there were no women. The suggestion about better lab group management was offered.

One particular observation and suggestion appeared on several survey forms. This dealt with the lack of women role models. Several respondents felt uneasy about what to expect in the work place after college. It was suggested that it would be good to have women engineers and/or graduates come back to speak to CET classes about their work experiences. It was felt that this would help all the CET students, both men and women. One of the InGEAR goals for the GSU campus was to raise the awareness of gender equity on campus. As a part of the survey, the women were asked if they could or would be willing to be part of a mentoring system and most offered to help. Not surprisingly, several surveys suggested having seminars about work place attitudes and behavior to prepare all the CET graduates for the current work environment. The seminar or some type of ‘basic training’ for both men and women should be designed not only to better prepare women to interact or respond in those situations where gender becomes an issue, but also make men and women more aware of actions that precipitate awkward or difficult work conditions related to gender. The course could cover what to expect, how to handle it, and what recourse is available.

One last area of the survey dealt with what was encountered in the work place and has there been changes. About half of the women had encountered some type of problem bordering on resentment to discrimination. Many were the first technically trained women in their office and
several observed that they felt age was more of an obstacle than gender. Several commented that more women are entering the civil field now and that the work force is becoming younger and more accepting. There seem to be fewer raised eyebrows. Now that several of the graduates have risen to supervisory levels, some offered the observation that the men have to learn to deal with women as supervisors and their higher salaries.

One final observation about changes in the workplace came from one CET graduate who is now in charge of multimillion-dollar cable-stay bridge project. She observed that women now have more opportunities than ever. She also observed that when she started working construction 12 years ago there were two restrooms in construction trailers: one for men and one for women. Now she finds there is just one. She views this as progress.

APPENDIX

InGEAR PROJECT  (GENDER EQUITY STUDY)

Year of graduation from CET at Georgia Southern  ____________

CHOOSING CET AS A MAJOR

At what age did you decide to pursue a career in the civil field?  ______

How did you come to choosing the civil field for a career? What influenced you to consider or choose the civil field?  (Use additional space if needed)

Did any person(s) influence or encourage you to enter the civil field? If so, who?

Did Georgia Southern or anyone at Georgia Southern provide any information that influenced your decision? If yes, what was that information?

THE CET PROGRAM AT GEORGIA SOUTHERN

As a female majoring in CET at GSU do you remember any situations, programs, opportunities etc in the community, at GSU or within the CET program that were helpful to you as a female that contributed to your success in the CET program? Please describe.

Were there any situations, requirements, programs, etc. that interfered with your being successful in the CET program? Please describe.

Can you suggest any programs or changes that could make the CET program and/or Georgia Southern more responsive or supportive of females majoring in nontraditional fields?

WORK ENVIRONMENT AFTER GRADUATION

At this time are you employed in the civil field? Yes _____ No _____

If yes, what is your Title/Position__________________________

Employer__________________________

How many years have you been with this employer? ____________

Did you find employment in the civil field upon graduation? Yes _____ No _____
If yes, what was your Title/Position__________________________
Employer__________________________
How would you describe your work environment from a gender equity standpoint at your first employer?

From a gender equity viewpoint could Georgia Southern or the CET program have done anything to better prepare you for the workplace? If anything, what?

Have you seen any change in the gender equity atmosphere in the workplace? If so, what type of changes?

If you had it to do again, would you choose a career in the civil field? Why or why not?

MENTORING
Would you be willing to answer questions about the civil field for young women (middle school through early college) considering it as a career? Yes____ No____

Would your employer be supportive of programs to show young women what your work environment involves? Yes____ No____

Would your employer be supportive of your participation in programs at Georgia Southern or other locations in the Southeast that provide information and the opportunity for young women to meet women who work in the civil area? Yes____ No____

Please complete if you would consider being a mentor or would like a copy of the results. Otherwise this is optional.

Name______________________________
Address______________________________
Phone______________________________ Work or Home? Please circle one.

MILAN E. DEGYANSKY
Milan E. Degyansky is currently Professor and Coordinator of Civil Engineering Technology at Georgia Southern University where he has taught since 1980. A native of Altoona, Pennsylvania he attended the Altoona Campus of Penn State and graduated from Penn State with a BS and MS in Sanitary Engineering. He began his teaching career at the Altoona Campus and was one of the original faculty who started the engineering technology programs at the Capitol Campus of Penn State in Middletown, Pa. Within the American Society of Civil Engineers he has been President of the Georgia Section, chairman of the Committee on Technology Accreditation and Curriculum and a TAC/ABET accreditor.