The status of women in health science computing

by LYNN L. PETERSON

The University of Texas Health Science Center at Dallas

Dallas, Texas

The computing profession is now just over 25 years old. During this 25-year period, women increased in the labor force from 34 percent of all women ages 16 and over in 1950 to 46 percent in 1975. Since computing developed during the period when females became a larger proportion of the work force, the question arises as to whether women are equitably represented in this profession. The present decade has brought a consciousness-raising with respect to woman’s role in the professions in general, with an interest in the role of women in the computing profession following naturally. The health care industries have become an ever more important and visible component of the U. S. Gross National Product, resulting in increasing scrutiny of the conduct within the health care professions. With this background, the question of the status of women in Health Science Computing appears to be a logical one to consider.

The ACM-SIGBIO Symposium on Health Computing Careers was held in June 1977 to provide a broad survey of present and future health computing careers. A basic understanding was that Health Science Computing was not just computer science practiced and applied in a Health Science Center setting, and it was not just medicine utilizing computers as one of the many specialized tools at its disposal. Health Science Computing was seen as combining capabilities of computer science and medicine and emerging as a discipline of its own to address areas of patient care, research, education and service. However, if our concern is women’s role in Health Science Computing, we can gain both knowledge and perspective by examining the two major components of its root—computer science and medicine.

COMPUTER SCIENCE AND WHERE WOMEN FIT

To look at those who are in the process of preparing for a career in computer science, we refer to a study done in the fall of 1975 by Mamrak and Montanelli. Their findings show clearly that the number of students enrolled in computer science programs has increased dramatically since the early 1970s. They also show a small but statistically significant increase in the enrollment of women in computer science at the bachelor’s level during the period from 1971-1975. But a look at the numbers of students in bachelors, masters and doctoral degree programs shows a moderate decrease in the percentage of women enrolled and graduating as the degree level increased. It is possible that one of the reasons for this is the lack of role models to encourage aspiration to higher-level career attainments. For the 1971-75 time period, the sex distribution of computer science faculty indicates a clear lack of availability of women role models in the higher academic ranks.

Next, let us look at those who are actually engaged in computing as a career. In 1975, women made up 39 percent of those in the labor force. At the same time, they comprised approximately 31 percent of those employed in computing at all levels. In the data entry positions, 99 percent were women. In programming and analysis, the percentage of women holding these job titles was no higher than 20 percent. An explanation of this situation could be the one offered by Weber and Gilchrist. Approximately 34 percent of the baccalaureate degrees awarded by American colleges and universities in 1971 went to women. If letters, nursing, fine arts, applied arts and home economics are excluded, the percentage of women drops to 26 percent. It is possible then that not enough women are receiving baccalaureate degrees in fields appropriate for entry into the computing profession to raise the percentage significantly through the mechanism of providing qualified applicants.

Another view of the role of women in the computing profession involved a survey of 425 women (77 percent responses) in data processing conducted in 1975 by Asprey and Laffan to determine how women felt about their status and their potentialities. The survey showed that 68 percent felt they had equal status with their colleagues in pay, promotions and overall. Some 70 percent of the respondents felt they had opportunities to advance to a senior level and more than half (actually 56 percent) felt opportunities to hold highly responsible management positions were available to them as women. The survey showed that the availability of part-time employment or of work on a contract basis made the computing field attractive to women with family responsibilities. Betty Maskewitz, now Director of BCTIC at the Oak Ridge National Laboratories, is quoted as saying “computing is a wonderful field for women—an exciting field for anyone regardless of sex or any other stupid qualifier.”

While the computing field received a rather positive subjective evaluation by women employed in it, one might wonder if this field of endeavor is then hospitable to all. A recent Datamation article shows that the computing profession is clearly not for everyone, that those individuals who are
attracted to computing as a career do not represent a cross-section of working professionals. A survey reported in the article shows that data processing people show a strong need for personal accomplishment, for learning and developing beyond where they are, for being stimulated and challenged; in short, a high "growth need." In fact, of all the professions surveyed, computing professionals showed the highest level of "growth need." At the same time, data processing people show a negligible need to interact with others, the lowest "social need" of all professions surveyed. In fact, it is felt that, if asked, most programmers would probably say that they preferred to work alone in a place where they couldn't be disturbed by other people. Computing professionals then do not merely represent a cross-section of the work force, but have some distinctive characteristics. In the absence of arguments to the contrary, we can assume that these personality traits are represented in both sexes.

MEDICINE AND WHERE WOMEN FIT

A look at medicine, the other major component of the root of Health Science Computing, shows that women in academic medicine, the area of medicine most likely to be in contact with Health Science Computing professionals, do not fare as well. Judith Braslow of the AAMC staff stated that of 48,500 faculty members in the nation's medical schools, 15 percent were women. Furthermore, of the 38,973 full-time faculty, 10 percent of the M.D.s and 15 percent of the Ph.D.s were women. Subjectively, their situation was felt to be improving. These women felt freer to move as career advancement dictated than was previously the case, and many were willing to make the sacrifices involved in moving to administrative positions. Many were now being asked to serve on committees where the female point of view was desired but as a result were being greatly overcommitted. However, they felt that in spite of the progress made there was still a dearth of women faculty role models.

MEDICAL COMPUTER SCIENCE

In order to qualify for many of the positions in the computing field, one is required to have the capacity for logical thinking instead of a specific preparation. Furthermore, for computing people such as data entry personnel, computer operators and junior programmers without a defined specialty, training in a specific applications area of computing is not required. It is, however, when we address the preparation of professionals in the specialty area of Health Science Computing that we are led to more academic considerations.

The academic training grounds of many Health Science Computing professionals are programs called by such names as Medical Computer Science, Medical Information Science, Medical Informatics or any of a variety of terms. In 1977, a survey of existing training programs in Medical Computer Science was conducted to update an earlier published study. An interim report on this survey, presented at the SIG-BIO Symposium on Health Computing Careers, is available from, and will be kept current by, The University of Texas Health Science Center at Dallas. This survey shows that, according to Medical Computer Science practitioners and educators, job opportunities in health computing abound for adequately trained individuals. This situation shows no signs of slackening in the near future. The survey showed there were 92 percent as many students enrolled in Medical Computer Science programs in 1977 as had graduated since 1970. The 385 people enrolled were to be thrust into the job market in the succeeding years, each having up-to-date training in medical computer science. However, they account for less than one-sixth of the projected requirements for biomedical computer specialists. Computer applications in medicine seem to be on the increase without a commensurate increase in the development of programs in Medical Computer Science to supply the personnel. If the projected need is accurate, this situation will have to change or else the bulk of the personpower recruited for medical computer science positions will have to be trained on the job. Thus, whatever route is used to approach jobs in medical computer science, job opportunities seem bright whether resulting from the growing requirement for accurate information posed by various programs of utilization of health care and assessment of the quality of health care, or resulting from the increasing clinical applications of the computer. Thus, for the foreseeable future, people with specialized training in Medical Information Science or Health Science Computing will have every expectation of finding employment which makes good use of their background.

STATUS OF WOMEN IN MEDICAL COMPUTER SCIENCE TRAINING PROGRAMS

In an attempt to investigate the status of women in the Medical Computer Science training environment, a pilot survey was conducted. A complete survey of the Medical Computer Science programs with respect to women's role is planned as a follow-up to the 1977 survey mentioned above. Those Medical Computer Science programs identified in the 1977 survey will be contacted with the intention of collecting data on the number of men and women currently enrolled in M.S. programs, in Ph.D. programs, in Post-doctoral programs, already graduated from M.S. and/or Ph.D. programs and currently serving on the faculty. The survey is planned for the spring of 1979 with results to be presented at NCC 79.

Since the number involved in the pilot study was small, impressions only from the pilot survey can be given, with more objective data to come from the survey itself. It can be seen from even this limited sample that, within Medical Computer Science departments, the role of women in these programs covers a wide spectrum. One program has no women faculty; one, representing the other end of the wide spectrum, shows a two-to-one male-to-female-faculty ratio. Several programs have no female graduate students; one, representing the other end of a wide spectrum, estimates
that its student population has a one-to-one male-to-female ratio. In one program, all graduates have been male; in another, all have been female.

From these limited glimpses, it appears that a program's openness to women depends heavily on the individual graduate program and that generalizations over all Medical Computer Science graduate programs will not apply. A comment from one spokesperson suggests that a program's openness to women depends also on whether the individual women want to give what it takes to meet the challenge of the graduate program. In speaking with representatives of various graduate programs, it was interesting to find frequent mention of a man or men who gave encouragement to a number of women during various stages of their academic development. Such individuals should obviously be recognized and encouraged. While female role models may be lacking in many areas, this type of person can serve a role model for both sexes.

ENCOURAGING GROWTH OF WOMEN'S ROLE IN HEALTH SCIENCE COMPUTING

These glimpses of women in computer science and in Medical Computer Science Training Programs shed some light on what might be done to encourage the growth of women's role in Medical Computing. Some positive suggestions:

- Encourage women who are inclined toward an interest in fields preparatory to computing to pursue that interest and get good high school and undergraduate training. Sex stereotypes which suggest that girls should not be good in math, for example, should not be perpetuated.
- If you are a woman in the field of Health Science Computing, consciously serve as role model whenever possible. Be visible. Talk about the problems and possibilities of women in this field. If you like your work, say so.
- Finally, be the very best you can in what you do. Don't shy away from a challenge—enjoy it!

By these means, and ones which others will, we hope, continue to suggest, we may ensure that qualified, interested women are not discouraged and/or prevented from engaging in careers in Health Science Computing.

REFERENCES
