STATISTICS IN INDUSTRY AND IMPLICATIONS FOR TEACHING

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In recent years there has been an increasingly intensified discussion and awareness about the importance of statistics in industry. Statisticians and non-statisticians must become more aware of the role statistical methods could play in industry if the statistical knowledge would be increased. Many more of us involved in the teaching of statistics must start to consider the implications of this for the teaching.

Many engineers have not been taught, or have been taught poorly, the value of statistical ideas and applications. Even today engineering students might face the same situation. This is alarming, since a practicing engineer must be capable of handling situations involving uncertainty and variability, which are general characteristics of many engineering problems. The industry of today needs engineers with experience of statistical thinking. There is also a need of engineers with more detailed knowledge in special statistical areas, e.g. statistical quality control, reliability, graphical techniques, and design of experiments. In addition to that there is a need of industrial statisticians educated at our statistics departments at the universities. Which then leads to the problem of recruitment of graduate students in statistics, as well as the shortage of good programs aiming at industrial statistics. There is also a demand for good in-house courses in statistics for practicing engineers. Hopefully this will imply more statistics in the engineering curricula in the future.

To try to improve the statistics education for engineers and industrial statisticians and to create good in-house courses are challenges worthwhile accepting. We are so many who are concerned with the teaching of statistics. Each one of us can contribute his or her share towards the common goal of making the progress in statistics education an ongoing effort. We cannot solve all problems during this conference, but we can take a small step, and as Bill Wyman puts it in one of his songs, " . . . an inch is better than a mile, in the right direction". A step in the right direction is to share experiences, listen to new ideas, to hear about individual approaches from other statisticians from all over the world, and then go back home and start implementing some of the new good ideas.

I am positive that the talks in this session will give us many stimulating discussions and ideas that will improve the teaching of statistics and the statistical education for engineers and industrial statisticians.

During the session we will get an insight into statistical quality control in Japanese industry. There will be a series of talks under the heading "Education for quality improvement", where, among other things, we will hear about a group approach to problem solving. We will share experiences that are made when conducting statistics courses for people employed by river

and water authorities. Engineers often have considerable prior knowledge concerning the influences of controlled factors upon response variables. Methods for incorporating this prior knowledge as part of the learning process will be discussed. We will hear about a contemporary approach to acceptance sampling, based on experiences from a most successful short course for IBM. The role of academic statistics departments in undertaking sponsored research and development and consultative work with industry in the context of transferring and improving methodology available to the industrial statistician will be examined. Examples of specific problems and interactions with mining and engineering companies will be discussed. Current approaches used to increase the level of statistical understanding by line workers, engineers, and management in industrial manufacturing plants will be discussed as well.

All these interesting and stimulating contributions will make this section on statistics in industry and implications for teaching to take a step in the right direction. To round off, I would like to quote from Vic Barnett's introductory talk at ICOTS I in Sheffield 1982, "We must teach statistics more comprehensively, more widely, more wisely, more realistically, more everything!"