Comments: Development of an early career academic supervisor in Statistics - a discussion on a guiding rubric

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I have a few comments that I would like to make on this paper, which discusses a very important matter for academic statisticians as well as for the field of Statistics.

Firstly, I wish to disagree with the statement that there is a "crisis" in Statistics in light of the increasing demand for statisticians, arising from the emergence of Data Science and more generally from Industry requiring "analytics"/Operations Research to help improve its processes; see [1]. Rather, it presents an opportunity for Statistics. It is not long ago that Statistics was not well known, and statisticians were mostly employed in academia or in government statistical services. As a result, Statistics was generally not seen by students as a career to focus on, and registration numbers were low. (Although there has long been a concern for the training of statisticians for careers in industry; see [2].)

The current increase in demand for statisticians has led to an increase in the number of students and correspondingly for academic statisticians to teach them. The disparity between the salaries in academia and in industry has always been a factor, not only for Statistics, but the growth in the number of statisticians in industry is very good for the statistical profession, which should, in time, lead to the growth of the number of students choosing to go into postgraduate studies.

Coming to the main subject of the paper – the development of a guiding rubric for an early career academic supervisor in Statistics, I would like to focus on the supervisor's role in helping and guiding the postgraduate student at the start of her research journey. At this stage the supervisor can "make or break" the student's entry into research.

The main challenge for postgraduate students after registering, particularly at PhD level, is finding a topic for their research. This is extremely important, given that the student

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will be spending much of the next three years or more engrossed in it. The topic can be proposed either by the supervisor or by the student. If by the former, it would often come from the supervisor's area of research. The advantage of this is that the supervisor would readily be able to introduce the student to the research area and provide relevant literature on the subject. The supervisor could motivate the research topic and will be able to guide the student in getting into the research and guide her along the way.

Alternatively, the supervisor could propose a statistical problem of interest to her, not necessarily from her research area, or even from another discipline, which would require the development of statistical theory to solve.

However, it could be that the student is not interested in any of the topics proposed by the supervisor, but has some ideas of her own for a topic. In light of the fact that the student will be deeply involved in her research for the next few years, being able to propose a topic for research in which she is interested, will be a strong motivating factor. It could be a question of interest to the student, a question in her area of expertise, or one arising from an applied problem that she has worked on.

In this situation, the supervisor should require the student to develop a draft proposal in sufficient detail for the supervisor to be able to understand the problem, assess the feasibility of the research and advise on its appropriateness for the degree (MSc/PhD). The supervisor may also feel that she does not have the skills to supervise the research, in which case she could advise that a co-supervisor or even another supervisor be appointed.

Once the research topic has been agreed upon, the next step is for the candidate to prepare a formal research proposal. This should be worked on by the candidate, with the assistance of the supervisor. It should then be presented to colleagues at a Departmental seminar and, based on comments received at the presentation, the proposal should be updated, approved by the supervisor and then formally submitted.

The supervisor should expect to spend more time on assisting the student during the early stages of the research, while the student is still getting a better understanding of the problem and is searching for the literature on the relevant research area. As the student's research progresses, the supervisor may be able to spend less time with the student, while still keeping an eye out for the possibility of the student getting "lost" in her work and requiring re-focusing on the research problem. In the latter stages of the research, while writing up her work for the thesis, and also for publication, the student may again require more time from the supervisor. The supervisor can also expect to spend time on the final thesis before it is formally submitted for examination, and on the article(s) submitted for publication.

References

[1] BARTHOLOMEW, DJ. 1995, *What is Statistics?* Journal of the Royal Statistical Society, Series A (Statistics in Society), 158(1): 1-20.

[2] BOARDMAN, T.J., HAHN, G.J., HILL, W.J., HOCKING, R.R., HUNTER, W.G., LAWTON, W.H., OTT, R.L., SNEE, R.D. & STRAWDERMAN, W.E. 1980, *Preparing statisticians for careers in industry: Report of the ASA section on statistical education committee on training of statisticians for industry.* The American Statistician, 34(2):65-80.