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

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1 Introduction

We would like to congratulate the authors on an insightful and interesting paper, addressing a contemporary topic for the continued existence of Statistics as an independent discipline in South Africa. In this commentary we express our support of the need of a guiding rubric, with some important additional views. We specifically and briefly focus on the identity crisis of Statistics, the need for mentoring networks of academics, funding of PhD students and concluding with some thoughts on guiding rubrics.

2 The identity crisis of statistics

It is generally accepted that development comes through diversity. The authors alluded to an identity crisis in Statistics and identified core and fundamental research training for a masters or doctoral qualification as compared to an applied role in industry and collaborating disciplines as a conundrum for a researcher, especially an early career individual, positioning themselves in the academic profession. This is a vital point for reflection within the profession as it boldly underlines the purpose and credibility of the discipline.

As the authors propose a common rubric, academic networking etc as an instrument for supervision guidance for early career academics, the compilation of such an instrument

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might have an immense impact on the future of the discipline and profession in South Africa. Recognising this impact, this proposal also opens up an opportunity of repurposing and refocusing of training effort in the South African context. An enhanced positioning of the statistical contribution in the scientific paradigm will improve and identify the unique and critical contribution of the discipline. In setting up the instruments, stakeholders should recognise the historical development path of statistics, its current positioning and the foreseen future contributions of the discipline.

It is generally accepted that the discipline is at a golden opportunity in time at the advent of Big Data and Data Science. [2] identifies the paper by Tukey, [5], "The future of data analysis" as a directional change towards the computation direction as Tukey presents the progression of statistics from applications towards Mathematics. He also recognises it as a prescient hint of today's Data Science. In his mathematical-application-computation triangular visualisation he also identifies a split in the computational direction in 1995 towards an extreme representing the Statistics discipline without parametric probability models or formal inference as opposed to a traditional statistical thinking path but with a renewed focus on application.

Both of these directions underscore the applied nature of the discipline and are in fact centroids of overlapping segments, clearly identifying computer implemented algorithmic procedures derived and formulated through abstract mathematical frameworks. The modern positioning of the discipline is non-negotiable in deriving guiding instruments for early career academics. It is vital to reflect on the past trajectory leading up to the current role and positioning of the discipline in the broader scientific methodology. This is indispensable to ascertain a departing position for the future placement, if at all plausible, of the Statistics discipline and its standing in the broader mathematical science domain.

3   Networks of academics

[3] describes the role of a supervisor to be that of a mentor, teacher, friend, parent, supporter, motivator, financier, project manager, critical reader, advisor, confidante, and voice of reason to the student. All of these are done while also contributing to lecturing, community engagement, academic citizenship, academic leadership, and focusing of their own research. This is clearly a daunting task for early career academics.

In their paper, the authors clearly identify and highlight some important challenges in South Africa with respect to PhD supervision in Statistics and Mathematical Statistics. These essentially are, lack of supervision skills and capacity, no or limited supervisory mentoring, large workload leading to burnout due to budget constraints and increasing number of students at universities. They specifically focus on the creation of a network of early career academics in Statistics, with frequent discussions and collaborations. Although this is a route with potential, there might be some unwillingness to participate since they might be of the opinion that sharing ideas and knowledge would negatively impact their future standing in the academic Statistical fraternity.

One way to mitigate this is to link early career academics with senior academics across universities, thus creating a network of senior academics with the mandate to support

and mentor young academics. Although there are a limited number of senior academics in Statistics departments in South Africa, grouping them into geographical and/or broad topic based groups may alleviate the identified problems. As an example there are 4 universities with Statistics departments in close proximity in Gauteng and similarly 3 in the Western Cape. A small group consisting of senior academics should not be difficult to create. There are also a number of recent and imminent retirements at certain universities. Some of these academics have extensive experience and it would be very beneficial to have this expertise available to the early career academics.

4   Funding of PhD students

The authors indicate that funding is a major and common cause of student drop out in general, and specifically at the PhD level. Merely funding the cost of tuition does ensure student success. It is therefore imperative that funding should cover the full cost of studying. The paper clearly shows the importance of procuring funds, but this requires a specific skill set. As indicated, funding discussions should be prior to starting the PhD journey.

As we indicate in Section 2, development comes through diversity. This is also applicable to funding. There should be a greater emphasis on the role of industry and perhaps a slight move away from the traditional sources of funding, e.g. the National Research Foundation. Academics frequently takes a traditional view of PhD research; that is a "significant and original contribution at the frontiers of a discipline or field" which cannot always be well integrated in the needs and requirements of an industry project. This should be carefully re-examined as we are of the view that industry funded PhD research can be of high quality while simultaneously addressing industry needs. There are successful industry funded Statistics masters degree research programmes hosted by at least two South African universities. These should be further expanded to include PhD research. This will also ensure that PhD research is contemporary and at the forefront.

5   A guiding rubric

The doctoral supervision process has for many years been recognised as having risks and uncertainties associated with it; see [4]. In the supervision process the supervisor(s) are required to guide the research project to be considered to be an independent body of scholarship, ensuring that it meets the required threshold or standard; see [1]. In this context the authors suggest a guiding rubric that is concerned with quality assurance. The focus therefore is on ensuring that the PhD thesis is of sufficiently high standard. It is important to note that there is a perceived difference between the requirements of PhD research within different institutions. In certain universities where Statistics is grouped together with other disciplines, eg. Actuarial Science, Population Studies, etc, the expectations for a Statistic PhD might be different from institutions where Statistics is an independent department. It is also imperative to realise that not all PhD research include the same level of theoretical development, and hence the outcomes could be different but

still qualify as PhD research. The modern positioning of the discipline is non-negotiable in deriving guiding rubrics for early career academics.

6   Conclusion

This commentary paper highlight and supports the notion of the need for a process of expanding and developing the supervisory capacity, specifically within early career academics. Within our overarching observation that diversity brings development, we are of the opinion that the immediate next steps should be consultation with all relevant stakeholders, i.e. students, supervisors and potential supervisors, expert industry collaborators, academic institutions and professional associations. This will lead to a better understanding of the challenges, also addressing the identity crisis of Statistics.

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