**SUBMISSION IDENTIFIERS:**

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| **Title** | Proposal for Revision of Senate Norms for Research Productivity and Postgraduate Supervision |
| **Author & Position** | Dr AP Matthews, Institutional Forum Academic Staff Representative for College of Agriculture, Engineering and Science |

**APPROVAL HISTORY**

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**SUBMISSION CONTENT**

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| **Summary of Motivation:**  The UKZN PU system for evaluation of research productivity and the current Senate norms for research productivity and postgraduate supervision have been repeatedly contested by UKZN academics since 2010. It is arguable that the PU system is suitable for financial awards for research output that earns DHET subsidy, but it is not suitable for performance management and promotion. Briefly, the reasons are: 1. Research of large collaborations is not recognized, 2. Collaboration is discouraged, 3. Quantity is valued above quality: time-consuming work on difficult problems for publication in prestigious journals is discouraged, 4. There are large variations by discipline in type and quantity of research output, 5. Senate norms are unrealistically high for many disciplines.  **Proposal:**  For performance management, promotion, and similar research and supervision evaluation, evaluation of an academic’s work will be determined to be meeting the norm according to criteria determined by the School Board on advice of the discipline to which the academic belongs. As guidelines, and as default norms in the absence of a School Board decision to determine different criteria, the following rank-specific numerical targets will apply, as selected by the academic:   1. Number of postgrads supervised: lecturer 0.5, senior lecturer 1, associate professor 1.5, full professor 2 2. Research output:   **either** (i) average number of publications over the previous 3 years: lecturer 0.5, senior lecturer 1, associate professor 1.5, full professor 2  **or** (ii) average PU during the previous 3 years: lecturer 15 PU, senior lecturer 30 PU, associate professor 45 PU, full professor 60 PU  The School Board may decide to use some or all of the criteria under (a) and (b), and in the absence of a School Board decision, criteria (a) and (b) will apply. The School Board is also authorised to determine criteria for fields and sub-fields within a discipline. The current PU system may remain for financial rewards for research output.  For performance management, the numerical indicators will be used as follows: 0 gets rating 1, between 0 and the norm gets rating 2, from the norm to just below the next rank value up gets rating 3, and meeting or exceeding the next rank value up gets rating 4. Promotion criteria will be revised accordingly.  The spirit of this proposal is: 1. Every academic is expected to be active in research. 2. Every academic is encouraged to supervise at least one postgraduate student, depending on the number of postgraduates who need supervision 3. The emphasis is on quality of research and supervision rather than on quantity of output. 4. Discipline- and field-specific research and supervision criteria and indicators for evaluation are determined by School Boards. 5. Numerical indicators are guides for academic judgment, not absolute and rigid determiners.  **Detailed Motivation:**  Problems with the current PU system and Senate norms are as follows:  First, the system undervalues the work of members of large collaborations such as in particle physics (e.g. at CERN), astrophysics (including SKA-related research), and HIV-related research. UKZN has already lost Dr Sahal Yacoob1, an active Black South African particle physicist in the ATLAS (CERN) collaboration, due to lack of support from UKZN, with the consequence that UKZN has been removed from the SA-CERN programme. This has caused reputational damage to UKZN. If the current policy remains in place, UKZN’s participation in the SKA programme and other Big Science projects could also be in jeopardy.  Second, any collaboration, even in small teams, is discouraged because credit for a paper is divided by the number of authors. The basic flaw in this approach (apart from the difficulty, or impossibility, of rating the value of publications with numerical measures) is that equal value is assigned to every paper, whereas in reality some papers need more work and have greater value than other papers.  Third, quantity is valued above quality. 60 PU are awarded to every paper, regardless of its significance or citations. It is easier to achieve success by publishing many low-quality papers than few high-quality papers.  Fourth, there are large differences among disciplines in quantity and type of research output. It is well-known that in pure mathematics the publication rate is low, whereas in some fields of medicine it is high, and that books are common in humanities and technical reports in engineering. Output also varies by sub-discipline, with, for example, a higher publication rate in materials physics than in theoretical physics. It is not advisable to use one set of criteria for all fields.  Fifth, the current Senate norms are unrealistically high for some disciplines, in comparison with actual productivity levels in South Africa and internationally. For example, in physics2 the national norm for personal publication productivity (not including student contribution) is an annual mean of about 1 paper (or 15 PU) for lecturers and 2 papers (or 30 PU) for professors, with a wide variation in PU due to a wide variation in number of authors per paper. At the world’s top universities this rate rises to a mean of about 4 papers (60 PU) per annum for full professors. In physics, the median number of authors per paper is about 4, so it follows that 1 paper per year accrues, on average, 15 PU per year.  The current postgraduate supervision norm is 6 postgrads per professor. This number was cited in a 2010 Senate report as having been derived from Australian data. However, these data for 2010 show much lower numbers of postgrads per supervisor3. The mean number of research masters and doctoral students per academic (including research staff) is 1.4. The DHET 2015 report on 2013 university statistics4 shows that for the five largest universities in South Africa (UCT, UKZN, Stellenbosch, Pretoria, Wits) the mean is 1.4 doctoral students and 4.5 masters students per academic. The total is close to 6, but the data do not distinguish research masters from non-research masters. The Australian data give a mean of about 6 postgrads per academic if non-research masters are counted, so it is possible that this effect is present in the South African data cited here.  Even if the South African mean is actually 6 research postgrads per academic, this is a mean of what is likely a skewed distribution, in which case the mean is higher than the median. This leads to another flaw in the UKZN system: the mean, intended as the typical value, is set as the entry level. This presents two problems. First, in the skewed distributions common for productivity, the median is a better indicator of typical output than the mean. Second, even if the median were used as entry level for the norm, it would imply that the lower 50% of academics are below the norm and effectively discounted. It would be more reasonable to set the entry level at the lowest 10% or 25%.  There is yet another problem with the current system, namely reliance on numerical indicators. Research and supervision cannot be reduced to simple numbers. Numerical indicators – a variety of them – should be used as guides, as indicators rather than as determiners. A sensible system of research evaluation should allow for judgment, guided by a variety of numerical indicators. It should also emphasise quality; for example quality of supervision should be more important than the number of postgrads being supervised, and in fact it would be prudent to set an *upper* limit rather than a lower limit on this number, so that supervisor time is not diluted to the extent that supervision quality is compromised. Furthermore, it is not always possible in all disciplines to find postgrads to supervise, so supervision should be encouraged but not required, depending on availability of postgards. In short, academic judgment and flexibility should be applied.  It is beyond the scope of this proposal to provide comprehensive data and analysis on research productivity and postgrad supervision for all disciplines. However, norms and trends are usually known to academics in their disciplines. Therefore, rather than prescribe new norms, the central proposal here is to leave it to disciplines, through their School Boards, to establish reasonable evaluation criteria. A democratic approach is the best approach, being collegial, and considering that academics are most knowledgeable about their own disciplines. That a democratic, participative approach is best is affirmed by the UKZN vision and mission statement principle 6: “Ensure effective governance through broad and inclusive participation, democratic representation, accountability, and transparency that serves as an example that contributes to building the democratic ethos of our country.”  School Boards, in exercising their judgment, should emphasis quality rather than quantity, and flexibility rather than prescription, within a reasonable university framework, aligned with national and international norms. The optional numerical criteria are provided as a default system that may be used as it stands or adapted.  **Notes and References:**  1Dr Sahal Yacoob was a physicist at UKZN from 2012 – June 2015 whose ATLAS research was not supported by the PU system. His ATLAS papers have about 3000 authors, from which he could receive at most 0.02 PU per paper. Web of Science data show that from 2012 to the present he published 321 papers with 7338 citations, representing a huge contribution to UKZN’s international research reputation and ranking. By year, he published 112 papers in 2012, 72 in 2013, 82 in 2014, and 54 to date in 2015, making him one of the top (if not *the* top) UKZN publishers by paper count. His 2012 Higgs boson paper, which associates UKZN with the 2013 Nobel Prize in Physics, has 2662 citations, making it to date the most highly-cited paper in the history of UKZN. Despite his considerable contribution to UKZN, Dr Yacoob did not receive support from UKZN through its policies and management. He would not have met the Senate research norm for lecturer in 2014 despite his 82 papers, and his repeated requests for a fair accommodation bore no fruit. There was no initiative from senior management to enact a policy exception or to motivate for urgent change to policy to accommodate ATLAS research. Largely as a result of this lack of support, Dr Yacoob has left for UCT, a university that actively recruits and supports ATLAS researchers. Not only has UKZN lost (or rather, driven out) an excellent Black South African physicist, teacher and public communicator (contrary to the UKZN goal of transformation with excellence) but UKZN has been ejected from the SA-CERN programme at a time when other South African universities are proud to join it. This treatment of an academic is a profound failure of policy, leadership and vision that has damaged UKZN’s reputation and prospects. The case of Dr Yacoob is the most notable, but is likely not to be unique. The 10 most highly-cited UKZN papers in the last 10 years are all from large collaborations in particle physics, astrophysics and medicine (mostly HIV-related) for which individual authors receive insignificant PU. This is an era of Big Science through large collaborations, and any university that does not support such research disqualifies itself from global research.  22013 Matthews AP. “Physics publication productivity in South African universities”. *Scientometrics.***95(1)** p. 69-86.  3The 2010 UKZN Senate Research Report, under the heading “Postgraduate Students”, states on page 29: *“The norm in Australia is 6 to 10 post grad students per academic staff. Taking the variance of 2.3 and guided by the Australian norm, we thus recommend a norm of 6 postgraduate students to be supervised per academic staff member for all staff that fall into the category of senior lecturer and above.”* A footnote stipulates that postgraduate students include only full masters students (50%+ research) and doctoral students. The Senate Report did not provide references for the cited statistic of 6 to 10 postgrads per academic. Australian postgraduate data is available on the web3a,3b,3c. The 2010 data show that there were 47 066 doctoral students by research, and 8 674 masters students by research, a total of 55 740. Full-time-equivalent supervisory staff were 26 840 teaching+research staff and 13 506 research-only staff, a total of 40 346. The ratio of students to supervisors is 1.4. If the additional 184 226 masters by coursework are included, this increases to 5.9, and with doctorate by coursework to 6.0. If these higher numbers of students (with masters by coursework counted) are divided by teaching+research staff (not counting research-only staff) then the ratio increases to about 10. It appears that the Senate report was not using the appropriate data to arrive at its conclusions.  3a [www.universitiesaustralia.edu.au/](http://www.universitiesaustralia.edu.au/)  3b[www.education.gov.au/selected-higher-education-statistics-2010-student-data](http://www.education.gov.au/selected-higher-education-statistics-2010-student-data)  3c[www.education.gov.au/selected-higher-education-statistics-2010-staff-data](http://www.education.gov.au/selected-higher-education-statistics-2010-staff-data)  4DHET 2013, Statistics on Post-School Education and Training in South Africa: 2013. Extracted data:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **2013** | **Hons** | **Masters** | **Doctoral** | **M+D** | **Staff** | **M/staff** | **D/staff** | **M+D/staff** | | **UCT** | 2974 | 4255 | 1428 | 5683 | 1093 | 3.9 | 1.3 | 5.2 | | **UKZN** | 3737 | 5164 | 2113 | 7277 | 1376 | 3.8 | 1.5 | 5.3 | | **UP** | 12626 | 6676 | 1978 | 8654 | 1300 | 5.1 | 1.5 | 6.7 | | **SU** | 3723 | 4722 | 1382 | 6104 | 1006 | 4.7 | 1.4 | 6.1 | | **Wits** | 2693 | 5567 | 1539 | 7106 | 1093 | 5.1 | 1.4 | 6.5 | | **Total** | 25753 | 26384 | 8440 | 34824 | 5868 | 4.5 | 1.4 | 5.9 |   Staff are permanent instruction and research staff, so contract, part-time, honorary and emeritus supervisors are not counted in calculating the ratios of students to staff. Note that the ratios are means that do not necessarily show typical (median) supervision load, but for skewed distributions with a high-value tail tend to mark the upper range. The data do not distinguish research masters from non-research masters. |
| **Financial implications:** Nil. |
| **Attachments:** Nil |