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THE 'BOOMERANG EFFECT': HOW OUTSOURCING IMPACTS ON THE WORKLOAD OF ACADEMICS

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Introduction

This paper is part of a bigger research project undertaken at UNISA (University of South Africa) to understand the changing roles and workload faced by UNISA academic staff in the present period of transition where UNISA changes from a correspondence institution to an institution which makes full use of the affordances of digital technologies. Two major reasons are cited as motivating the change: Firstly, the labour market expects university students to be digitally literate; secondly, UNISA hopes to improve the support for its students to increase retention and throughput rates (as requested by the Department of Higher Education & Training, DHET).

Research question & method

The research question guiding this paper was triggered by an internal time capturing report (du Plessis & Bester, 2014) at UNISA which observed a major perceived shift away from core academic tasks to tasks related to academic administration. How to explain this?

The *boomerang hypothesis* suggests one possible explanation. It is guided by the conceptual framework of the economics of distance education which suggests that traditionally distance education institutions can accommodate large numbers of students due to its cost-structure based on scale economies. This means that such institutions typically try to keep all those costs low which contribute to *variable costs per student*. Traditionally that meant shifting the onus of teaching away from interaction between teacher and student to a specially designed student-content interaction.

However, in a context where distance-teaching institutions want at the same time to make better use of the interactive affordances of digital technologies, including student-teacher interaction, the costs per student tend to rise. In such situations, efficiency considerations suggest limiting the 'damage' by resorting to outsourcing, especially those tasks related to increased student-teacher interaction, and to employ more staff on external, part-time contracts. This is the first leg of the boomerang hypothesis.

The second is that, while outsourcing indeed allows accommodating large number of students without increasing the fixed cost component of the instructional/research professional staff, the increased number of external part-time staff needs to be managed, which includes

recruitment, contracts, initiation and training in tasks, supervision and quality assurance, all adding to the academic administration workload of the core academic staff.

The research questions of this paper, derived from the boomerang hypothesis are:

1. Does UNISA react to mounting enrolment pressures by resorting to increased outsourcing?
2. Can the increases in outsourcing plausibly be connected to increases in academic administration thus explaining the perceived shift in academic workload documented in the UNISA time capturing results?

The research method, used to answer these questions, consists of an analysis of UNISA data from the HEDA (Higher Education Data Analyzer) database. We looked for data which would connect increased enrolment with increased levels of outsourcing. The extent to which the increased levels of outsourcing lead to increased academic administration is illustrated by modelling the effects of increases of enrolment in the case of marking student assignments.

The context: UNISA in transition

UNISA is an open distance learning university committed to "advancing social justice with an emphasis on redress, equity and empowerment of the previously disadvantaged groups in South Africa such as blacks, women, people with disabilities, the rural and urban poor and adults who have missed out on opportunities to access higher education." (UNISA, 2008). This commitment to open access leads to large increases in enrolments.

At the same time UNISA is increasingly expected to turn *access into success*. Success includes two things: First students are able to complete their degree successfully in a reasonable time. Second, students need to get a university education which responds to some basis requirements of the labour market, such as digital literacy. Both success conditions are intertwined: Moving online supposedly both enables UNISA to support students and, by studying online, students will acquire the digital literacy required for success in the labour market.

But what could moving online mean for a mega-university with close to 400,000 enrolments and where many of its big courses exceed 10,000? Making better use of the interactive affordances of digital technologies comes at a cost. Student-teacher interaction means chunking up the courses of 5000 and 10,000 students into classes of 50, i.e. hundred classes or 200 classes[1]. Even if a teaching assistant or e-tutor is supposed to cater for four classes you need to recruit 25 or 50 TAs respectively. These people need to be integrated in a deepening division of labour. They need to be inducted not only to competently navigate the LMS, myUNISA, but also how to moderate online discussions and mark assignments online; all this impacts on academics, on their roles and tasks, their work load, on costing, and on resource allocation.

[1] This is the approach taken by UNISA's signature courses (cf. Huelsmann & Shabalala, forthcoming).

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The cost structure of Distance Education

Distance education always used two strategies to achieve efficiencies*: capital for labour substitution and labour for labour substitution* (meaning the substitution of expensive labour by less expensive labour).

Shifting the main locus of teaching away from interaction to course development is a case of capital for labour substitution. The fixed costs of course development can be spread over many students. Labour for labour substitution applies when the function of the teacher can be unbundled in different roles, some of which can be given to less qualified and less expensive personnel[2].

To simplify matters let us say that in a traditional distance education you largely substitute the teacher by the teaching material, in economic terms, a fixed cost. This is a capital for labour substitution. The teaching material needs to be replicated and shipped to the student but all of this contributes only marginally to the variable cost per student. The student-teacher interaction is kept minimal: there are a few assignments to be marked and some occasional evening classes. Grading is done according to rubrics and does not require subject matter experts with senior postgraduate degrees. This illustrates the role of labour for labour substitution. The combined arrangement allows keeping variable costs per students low; where fixed costs of course development are high (as it may be occasionally the case when TV production is involved), the they can be spread over many students. The low variable costs per student means that even an increase in student numbers leads to decreasing average cost per student[3]. One of the consequences of this may, however, be in terms of quality assurance.

The advantageous cost structure of distance education was historically necessitated by the lack of a technology sustaining responsive student-teacher interaction at a distance. While this leads to a form of distance education susceptible to scale economies it also was considered as a central weakness of distance education and the major reason why distance education was widely seen as second rate.

The new affordances of digital technologies (with learning management systems and videoconferences or social media) have changed all this: responsive student-teacher interaction is possible but it comes at the cost of eroding scale economies.

Scale-economies dependent institutions like UNISA which want to make better use of the interactive affordances of the digital technologies need to find a way how to wriggle out of the

[2] Both strategies aim at reducing the variable cost per student (V) in the total cost formula. The total cost formula reads: Total costs = Fixed costs + Variable costs or: TC(N) = F+V*N, (F = Fixed costs, V = Variable costs per student and N = Number of students. (Note that Variable costs = V* N.) Average costs are AC = TC/N = F/N+V. Increasing N means that AC falls asymptotically towards V. Capital for labour substitution shifts costs to F basically by reducing the need for student-teacher interaction; labour for labour substitution decreases the impact of student-teacher interaction by decreasing V, e.g. through casualization of labour.

[3] Daniel et al. (2009) claims that distance education allows bringing down costs while at the same time increasing access and keeping up quality (Daniel's Iron Triangle). Daniel refers, however, to average cost per student.

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incompatibility between scale economies and responsive interaction. To limit the 'damage', which increasing student-teacher interaction does to the cost structure of distance education, distance teaching institutions tend to focus on labour for labour substitution rather than capital for labour substitution. Outsourcing is a point in case.

However, before addressing the question to which extent UNISA, as a response to increased enrolment figures, resorts to increased outsourcing, the time capturing results, which gave rise to the boomerang hypothesis at the first place, should be summarized.

The time capturing results

The data made available by du Plessis and Bester (2014) suggest that, for the academic staff at UNISA, in the time period between 2009 and 2013 there had been a shift away from core academic tasks to academic administration. The data are based on an ABC (Activity Based Costing) exercise. Academic staff members are requested to complete a survey in which they distribute their work time as percentages. These time sheets are completed for each semester (of approximately 900 hours), but it is important to note that it is based on the *perception* of the academics' sense of percentage time spent. The time of the respective staff is then turned into hours and converted into costs (ZAR). These figures are represented in the Table 1[4].

Much has been said about the credibility of these results. They are criticized for two reasons: Firstly, staff members report doing it rather carelessly and because they have to, not because they are convinced of the importance of the exercise. The time allocation breakdown is not based on diligent daily recording of activities but by rough estimates done in retrospect. However, the authors of the report argue that because of the sheer amount of academics having responded (about 83%) the perceived shift in workload should be taken seriously. Secondly, that the time capturing done in percentages, rather than in substantive hours, systematically excludes overtime. The allocation of workload is in percentage and, as soon as one allocates more than 100% the system stalls.

Table 3: Academic time capturing results from 2009-2013

	2009	2010	2011	2012	2013
Core academic	***431,255***	***461,320***	***459,638***	***533,039***	***665,593***
1. Course and curriculum development	22,836	24,963	26,749	30,436	39,299
2. Community engagement	34,536	37,759	36,399	40,401	58,844
3. Research	137,764	147,196	134,897	168,979	213,293
4. Tuition	236,119	251,402	261,593	293,223	354,157
Academic support	***207,937***	***257,683***	***229,492***	***267,372***	***460,377***
5. Academic administration	169,275	209,668	179,078	208,613	380,342
6. Academic personnel development	20,310	24,124	25,106	28,210	35,363
7. Community outreach	8,264	13,097	14,952	14,215	22,265
8. Executive management participation	10,088	10,794	10,356	16,334	22,407
Grand total	***639,192***	***719,003***	***689,130***	***800,411***	***1,125,970***

Source: Du Plessis & Bester (2014)

[4] That the figures go up though they are based on percentages is due to the fact that, together with the increased enrolments, staff numbers and salaries increase.

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If the core academic activities are disaggregated, it is not surprising that Research and Tuition are the biggest fields of activities. Course Development is the smallest field even as compared to community engagement[5]. Figures 1 illustrates the relative contributions of these core academic activities.

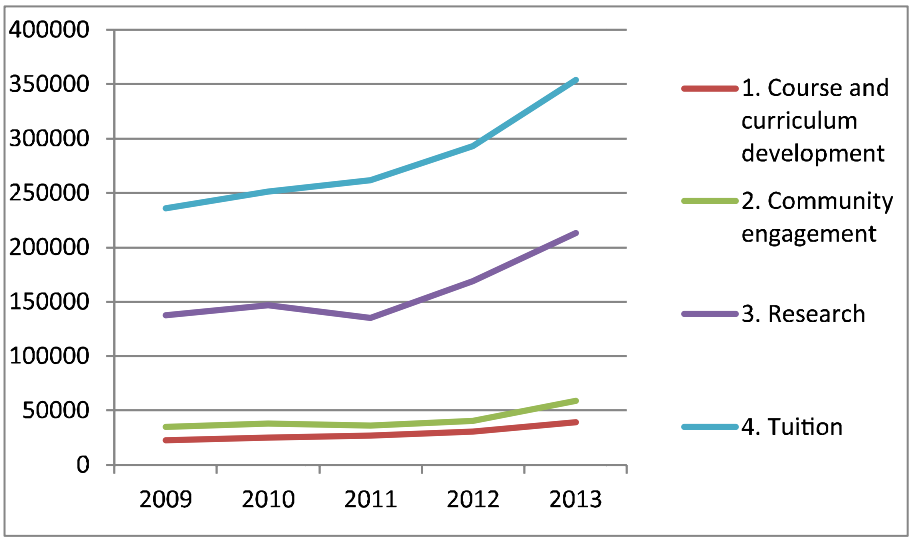

Figure 1. Core academic tasks

Figure 2 indicates the most dramatic aspect of the time capturing results, namely that there has been a dramatic increase in the Academic Administration from 2009 to 2013.

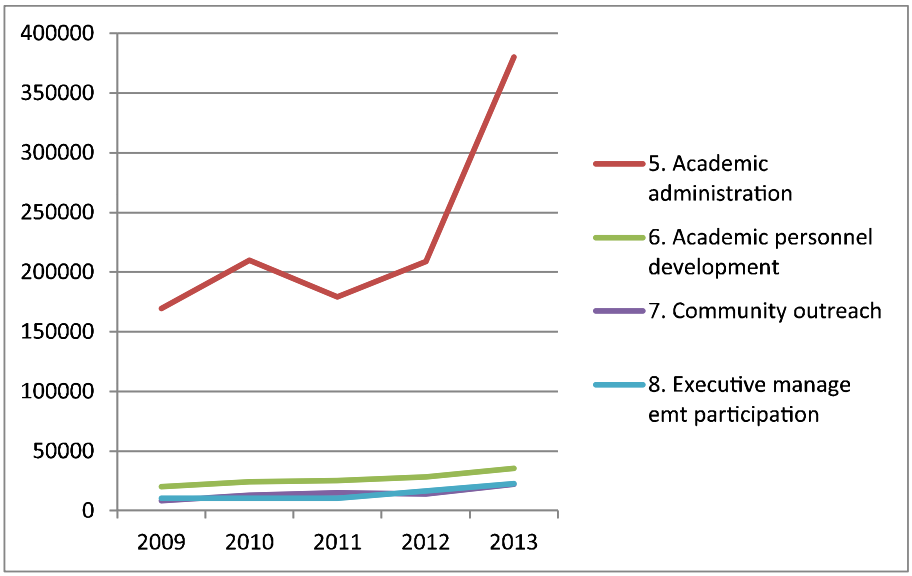

Figure 2. Academic time capturing results from 2009-2013 (Academic support)

[5] Note that tuition is not necessarily associated with variable costs. For example, setting the annual tutorial letters is listed under tuition. It is done by UNISA core academic staff and hence classified as part of the fixed costs.

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What is of most concern, and so noted in the du Plessis and Bester Report (2014), is that once you merge Research & Tuition in percentage terms, rather than in Rand value, and compare it to Academic Administration, Research & Tuition shows a relative decrease of 8%, whilst Academic Administration increases by about 8%.

Table 4: Tuition and &Research versus Academic Administration

	2009	2010	2011	2012	2013
Research and Tuition	58.5%	55.4%	57.5%	57.7%	50.4%
5. Academic administration	26.5%	29.2%	26.0%	26.1%	33.8%

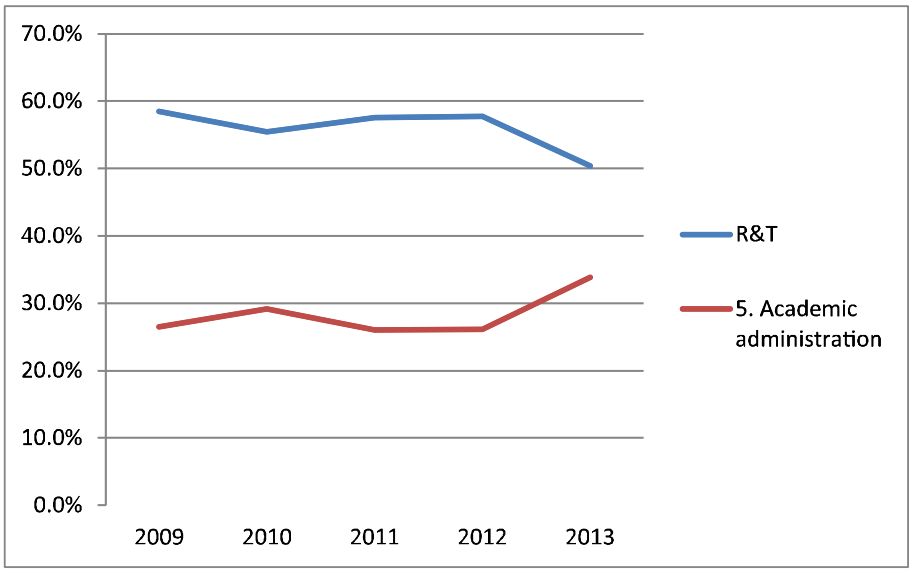

Figure 3. Tuition & Research versus Academic Administration

The findings should be a concern both from a management as well as from an academic perspective. From a management and costing perspective it should be a concern when academics find themselves allocating an ever greater part of their time to tasks not related to their core academic functions. This is likely to impinge on the quality of their core duties. Moreover, it should be a concern for any institution if peripheral administrative support activities start to outstrip the core functions (in this case tuition and research) of the institution.

What is underlying this perceived shift in the academic workload allocation reflected in the time capturing exercise? One possible explanation is based on the boomerang hypothesis. It states that UNISA under the pressure of increased enrolments resorts to outsourcing. While outsourcing indeed takes out some of the pressure, it boomerangs back as administrative tasks. The analysis of the HEDA data impressively confirms the first part of the boomerang hypothesis.

Analysis of HEDA data

The HEDA data show that the number of full time equivalents for instructional/research professional staff did increase with the full time equivalent enrolments. The FTE staff numbers went up; on average by 16%. Enrolments only increased by 6%.

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This, at first sight seems to contradict our assumption that increase enrolment increases workload pressures. In fact, the student-teacher ratio has improved. While in 2009 there was one FTE staff serving 85.1 FTE students, in 2014 one FTE staff could focus on 54.2 students. Essentially, staff and student numbers expand in parallel.

Table 5: FTE staff & FTE students

	2009	2010	2011	2012	2013	2014	
FTE staff [a]	1,598	1,792	1,937	2,097	2,541	3,346	16%
FTE enrolments [b]	136,108	148,275	68,679	172,304	197,102	181,425	6%
Ratio [c]	85.1	82.7	87.1	82.2	77.6	54.2	

Source: HEDA a: FTE = Full time equivalents for Instructional/research professional staff; b: Full time equivalents enrolments; c: Ratios= Full time equivalents enrolments/Full time equivalents for Instructional/research professional staff.

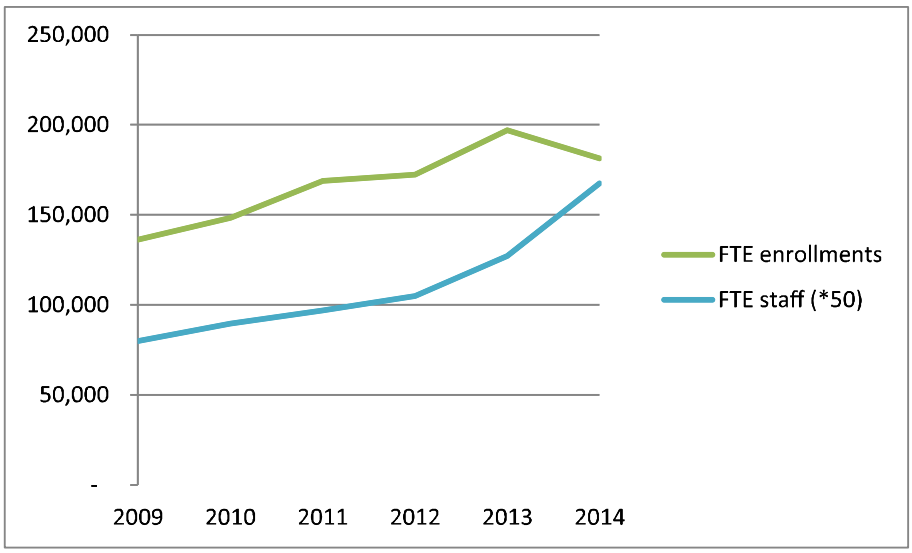

Figure 4. FTE staff vs. FTE students[6]

The overall student-staff ratio does not seem to signal increase workload pressure; but by decomposing the full time equivalents for Instructional/research and Professional staff into those employed on full-time and those on part-time basis, we come closer to the boomerang hypothesis.

Table 6: Ratios of full time and part time to total

	2009	2010	2011	2012	2013	2014
FTE [a]	1,598	1,792	1,937	2,097	2,541	3,346
Full time [b]	1,498	1,501	1,638	1,749	1,797	1,891
Part time [c]	101	291	299	347	744	1,455
Ratio full time to total	94%	84%	85%	83%	71%	57%
Ratio part time to total	6%	16%	15%	17%	29%	43%

Source: HEDA b: Most recent employed on full-time basis; c: Most recent employed on part-time basis

[6] Note that the FTE staff is multiplied by 50. The intention here is to visualize that FTE enrolment and FTE staff develops in parallel.

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The category of staff employed on a part-time basis consists of markers, e-tutors and teaching assistants, all involved in activities contributing to the variable costs per students. The HEDA data confirm the first part of the boomerang hypothesis: there is a marked shift in the employment strategy. While in 2009 most staff members were recruited on a full time basis and only 6% on a part time basis, the composition has drastically changed. In 2014 the percentage is close to fifty-fifty.

The graph shows that the number of part-time contracts has increased much faster than the number of full-time contracts, leading to a marked shift in the composition of the workforce.

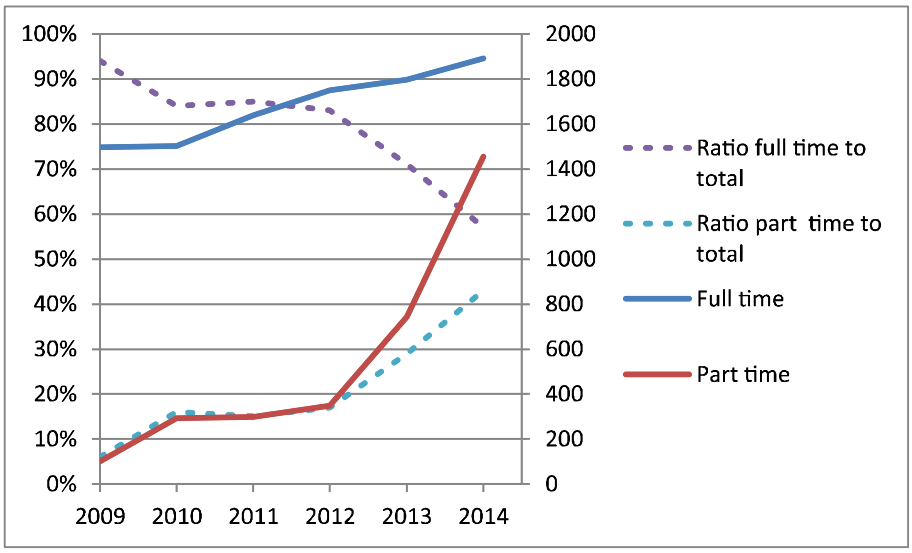

Figure 5. Ratios of full time and part time to total

The shift suggests that the increased costs related to making more use of responsive interaction at a distance, especially interaction between teacher and students, is compensated by a shift in employment practices to limit the 'damage' increased interaction does to the traditional cost structure of distance education. This is what the following table shows: due to the shift in employment conditions you can employ more staff with a C1 unit[7]. While in 2009 you could only employ 0.76 full time equivalents for Instructional/research professional staff for one C1 unit you can now employ 1.22. Hence, the shift in the composition of staff, which is at the same time a shift from fixed to variable costs, allows with the same budget to employ more staff.

[7] A C1 value is the equivalent to a senior lecturer's salary.

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Table 7: Budget implications of shift in staff composition

	2009	2010	2011	2012	2013	2014	AI(%) [f]
TB [a]	R 856,851	R 1,023,753	R 1,105,973	R 1,315,059	R 1,405,971	R 1,696,696	15%
C1 [b]	R 408,725	R 442,819	R 478,880	R 517,740	R 553,532	R 618,510	9%
Cost units [c]	2,096	2,312	2,310	2,540	2,540	2,743	6%
FTE staff [d]	1,598	1,792	1,937	2,097	2,541	3,346	16%
Ratio [e]	0.76	0.78	0.84	0.83	1.00	1.22	

Source: HEDA; a: TB = total budget (in thousand Rand); b: Academic cost unit (Rand); c: number of cost units; d: FTE = Full time equivalents for Instructional/research professional staff; e: FTE/cost units; f: average increase (%)

Does the shift in employment conditions affect the quality of the learning experience? We looked in a number of proxy quality measures (Table 6) which suggests that quality is not greatly affected. There are year by year more graduates; the success rate was improving until 2012. The considerable drop in 2013 is internally discussed (cf. Makhanya, 2014) and by some attributed to a calculation error (e.g. by including students enrolled in short term programs). Activity level of students on myUNISA is seen as a good indicator for student engagement[8]. Research output per capita has increased which could suggest that outsourcing indeed frees time for academic staff to keep up or increase their output.

Table 8: Proxy quality measures

	2009	2010	2011	2012	2013
Number of graduates	22,675	26,073	26,808	26,210	34,934
Success rate [a]	60%	63%	66%	67%	58%
Student active on myUnisa	75%	78%	83%	93%	96%
Research output per capita [b]	0.57	0.63	0.71	0.86	

Source: HEDA and Makhanya (2014); a: Makhanya (2014, p.16 Table 11); b: date for 2013 missing

The analysis of the HEDA figures tallies with what is expected from an analysis of the cost structure of distance education: variable cost per student serves as a safety valve when enrolment pressures tend to increase academic workload. Activities contributing to variable costs are associated with markers, e-tutors and teaching assistants; staff employed in these roles are typically employed on a part-time basis. The HEDA figures impressively demonstrate the shifting composition of the instructional/research professional staff to staff employed on a part-time basis, i.e. markers, e-tutors or teaching assistants.

A model-based reflection on marking

What about the second part of the boomerang hypothesis? Is it possible to show that the demonstrated shift to outsourcing leads to increased academic administration? This section is not based on empirical evidence but on modelling the effects on enrolment numbers on marking using figures and requirements from the UNISA context.

[8] Funding depends on completing a course or module which requires completing the assignments which are uploaded to my UNISA.

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The initial conundrum is the following: Increased number of students means more marking to be done. Marking is classified as tuition hence a core academic task. The time capturing results confirm that, while tuition goes up in absolute terms, the percentage of core academic tasks decreases relative to academic administration; how could that be explained?

Applying the boomerang hypothesis to marking (as a proxy for tuition) suggests the following explanation: Increased enrolment means that marking has to be outsourced. This means that the academics' time is re-allocated to the following tasks:

- *Recruiting and appointing suitable external markers*. Some parts of this would be done by the HR department and administrative support, but the core academic staff retains responsibility for the external markers appointed to their course.
- *Training the external markers* (in the discipline content, in the outcomes required of the specific module, in the marking rubric, as well as in UNISA ICT systems such as the J-Router and myUNISA).
- *Physically or electronically moving assignments and scripts to external markers*, and receiving them back, is normally done by an administrative person, but the academic would have to supervise and take responsibility for this task.
- *Moderating the scripts that have been marked by the external markers*. The UNISA Assessment Policy requires that all 10% of all marking should be moderated by a second person. In this case, the initial marking is done by an external marker, and the moderation is done by the full-time academic.

At UNISA the term moderation is used for checking if markers do mark appropriately. Markers have neither a personal relationship with students nor do they necessarily identify with the institution. They mark for the money they receive. Hence UNISA needs to supervise if the marking has been done properly. The following table models what happens when a program increases its enrolment form 1000 to 5000 students and the departments strictly applies the UNISA moderation requirements.

Table 9: Marking and moderation model

Stud no	1000	1500	2000	2500	3000	3500	4000	4500	5000
Mark cap (# papers)	200	200	200	200	200	200	200	200	200
marking time (hrs. per semester)	50	50	50	50	50	50	50	50	50
papers outsourced	800	1300	1800	2300	2800	3300	3800	4300	4800
moderation (10%)	80	130	180	230	280	330	380	430	480
Total to mark (# papers)	1080	1630	2180	2730	3280	3830	4380	4930	5480
Marking (non moderation)	120	70	20	-30	-80	-130	-180	-230	-280
# of markers	4	7	9	12	14	17	19	22	24

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The table demonstrates, based on simplified model assumptions, the effect of increased enrolments on the grading capacity of an academic. The calculation demonstrates:

- that, obviously, the initial marking capacity of the academic (assumed to be 200 papers) is quickly exhausted when you increase enrolments; this makes outsourcing marking necessary; however, the model shows further:
- maintaining marking quality of outsourcing requires *moderation*; while buffering the impact of enrolment on marking, moderation quite quickly absorbs all the assessment capacity of the academic;
- the model also suggests that you can stretch the buffering effect of moderation by decreasing the percentage of papers to be double checked (if you would substitute the 10% in the table by merely 2%);
- further increases in enrolment have to be countered by providing the lead academic with full-time academic assistants; this again comes with additional administrative workload since the academic now leads a team.

That academics interpret all this as a relative increase in academic administration and do not experience it as an increase of the core academic activity of tuition is because outsourcing protects them against having to do proportionally more marking. But at the same time markers need to be found, they need to get contracts, they must be trained. That having been done, the moderation process sets in. Without further assistance being provided moderation quickly spirals out of hand. The lead lecturer needs a team. Pushing down marking and moderation tasks to the markers and teaching assistants, the core staff remains with activities (correctly) perceived as academic administration.

The model shows allows tracing a morphing process: Marking morphs into moderation, and moderation morphs into academic administration. This can be graphically illustrated as in Figure 6 where Tuition (T) and Research (R) go down and Academic Administration (AA) goes up as Outsourcing (O) goes up (and Community Engagement (CE) remains stable.

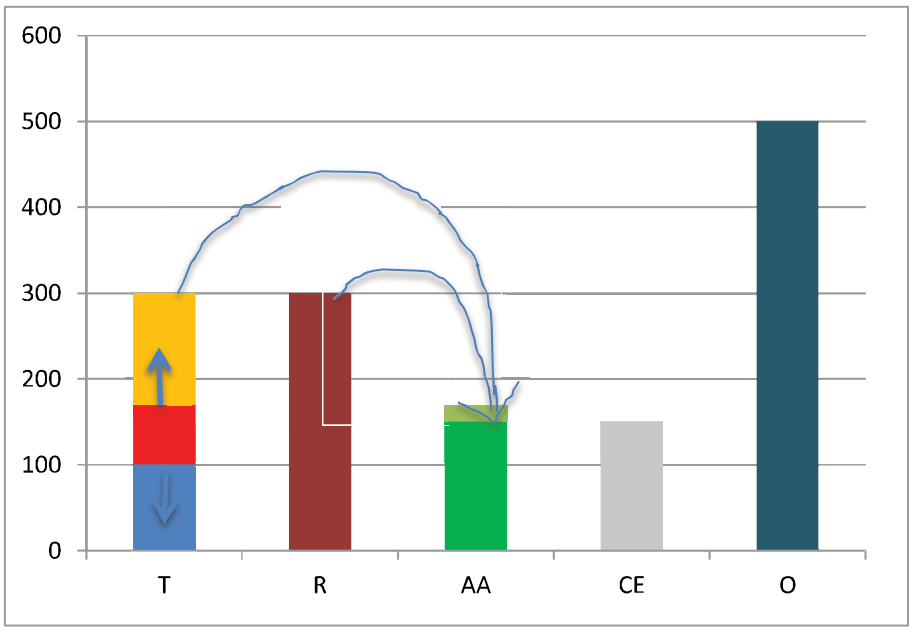

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Figure 6. Ratios of full time and part time to total

Limitations and conclusions

The research question of the paper was triggered by an internal time capturing report of UNISA which reported that UNISA academics see a reallocation of their workload away from their academic core task towards academic administration. This finding gave rise to the boomerang hypothesis which includes two predictions: i) UNISA responds to increased enrolment pressures by resorting to increased levels of outsourcing; ii) outsourcing, in turn, 'boomerangs back' in the form of increased academic administration.

The data extracted from HEDA impressively demonstrate the first point. The increased level of outsourcing is reflected in a massive change to employing part time staff. This form of contract typically includes markers, e-tutors and teaching assistants.

The second part of the boomerang hypothesis would require a time capturing exercise with a specific focus on administrating markers, e-tutors and teaching assistants. By modelling the effect of increases of enrolments on stretching the departmental marking capacities, a morphing process away from the academic core task of marking (as part of tuition) towards academic administration was made plausible.

While there is a high level of plausibility of the assumption that outsourcing indeed impacts on increased academic workload the effect size to which it contributes to the perceived shift reported in the time capturing results, remains unclear. There are indeed other factors also contributing to the perceived shift. For example, UNISA's commitment to improve quality in a transparent way means that UNISA has set a number of indicators against which performance is to be measured. This leads to a considerable increase in measurement activities within UNISA[9]. All this is perceived by academics as part of academic administration. Further qualitative research in the form of focus-group interviews with academic staff is being undertaken.

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[9] Measurement of quality may, hence, compound the problem of quality.

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