

A MODEL FOR MANAGEMENT OF WORKLOAD OF ACADEMIC STAFF AT A DEVELOPING UNIVERSITY

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Abstract

Academic workload models provide framework for ensuring that academic workloads are distributed equitably and transparently. The models are also useful tools for managing capacity optimization and planning. The work of academics could be perceived as complex, individually distinctive and multidimensional. Therefore, the challenge in designing an acceptable model is striking the right balance between complexity and practical applicability.

This paper is an attempt at designing an academic workload model in the context of a developing University of Technology (UoT). Using actual hours modelling approach, a workload model that prioritises teaching and learning aspects of the work of academics is proposed.

Keywords: Academic Workload, Model, Teaching & Learning, Research, Community Engagement, Administration

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1 Background

The purpose of an academic workload model for an institution of higher learning is to provide a mechanism for ensuring that academic workloads are distributed equitably and transparently.

Academic activities are complex and multidimensional, the complex nature of academic workloads must be considered in the process of model development. The workload model at a University of Technology is developed to incorporate the key elements of the work of academic staff (Teaching and learning, research and innovation, community engagement and academic administration) within the context of a University of Technology in South Africa.

Programme Qualification Mix (PQM) of this University of technology reflects a predominantly undergraduate institution that focuses on teaching excellence in Natural Sciences, Engineering and Business Management. To achieve teaching excellence, academic workload factors have to be distributed in a manner that allows prioritisation of teaching and learning. Therefore, the model makes allowance for more loading factors towards teaching and learning activities.

Du Pre (2009) identified core academic functions of UoTs, one of which is that UoTs should provide greater learning opportunities to students. This means that students need to be exposed to the practical knowledge that would make them more skilled, more competent, more employable and more employer centred. On the part of academics, providing greater learning opportunities for students at UoTs imply greater contact with students especially bearing in

mind the hands-on nature of transfer of knowledge in the UoT learning environment.

In the recent past, the department of higher education and training (DHET) has expressed concern about “mission drift” of Universities. This has led to the development of the draft Policy Framework on Differentiation in the South African Post-School System (DHET, 2014). The emphasis of the proposed differentiation policy is to provide a policy framework to ensure that University abide with their academic identities of which the traditional Universities are expected to be more intensively research driven. UoTs on the other hand are expected to focus on technology-based teaching and production of technologically ready graduates that would help drive the economy (DHET, 2014).

A tool such as the Workload Model would provide a good monitoring mechanism for ensuring that Universities especially UoTs stay focused to their core mandate of providing greater practical learning opportunities for their students. This could be achieved by allocating more academic loading factors towards teaching and learning activities.

The UoT where this model is developed recognizes the core mandate of UoTs and therefore prioritizes the scholarship of teaching and learning; the workload model provides a framework for effective management of activities of academics for optimal teaching and learning outcomes. Academics at the level of Junior Lecturer are expected to commit at least 80% of their time on teaching and learning activities. The remaining time for Junior Lecturers is distributed to other activities in agreement with the head of department. Workload proportion for teaching

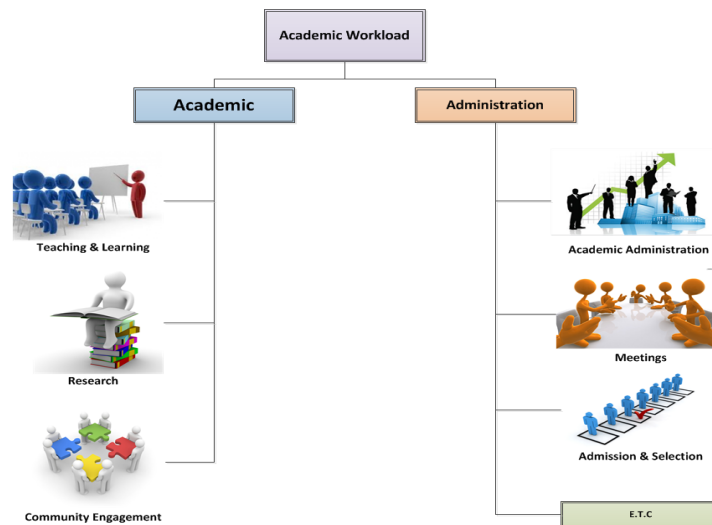
and learning activities decreases slightly with rise in employment ranks. Senior academics are afforded more time for research and community engagement. Research professors are expected to commit at least 90% of their time on research, as research is their key performance area. Heads of departments and deans are expected to concentrate on running academic departments and faculties respectively. As such their functions are heavily weighted on administration. An important component of teaching and learning in the context of UoTs is Work Integrated learning (WIL). Therefore workload factors are also earmarked for WIL coordinators/assessors as a full academic

activity. Detailed distribution of load allocation by job profile or rank is presented in Table 2.

2 Modelling approach

The work of academics could be located within two broad categories: Academic and Administration. The academic strand could further be broken down to teaching and learning, research and innovation and community engagement. Other duties such as academic administration, meetings and so forth are located under administration. The breakdown is illustrated in Figure 1

Figure 1. Strands of academic workload



The workload of an academic is the aggregated time spent on academic and administrative activities. The time-spent approach is used in developing the model; one workload unit is equal to one hour. Working time available for academics is considered in terms of the normal working hours of 8 hours a day from Monday through Friday. These aggregate to 40 hours a week. Therefore, the maximum workload for operational teaching efficiency is considered to be 40 hours, this implies that any academic whose load is above this limit is considered have excess academic load. However, this does not necessarily imply contractual overload as the workload model is designed on the basis of academic semester periods and not the whole contractual year. The academic semester period usually comprise of sixteen weeks for first semester and fourteen weeks for second semester, a total of thirty weeks per annual against contractual annual employment period of forty-eight weeks per annum. Factoring in annual leave of four weeks and approximately two weeks (12 days) of public holidays, the expected working period comes to about forty-six weeks per annum.

Total workload for an academic is calculated as follows (Parks, *et al.*, 1995):

$$TW = TL + RI + CE + AD \quad (1)$$

where,

$TW = Total Workload$

$TL = Time on Teaching and Learning$

$RI = Time on Research and Innovation$

$CE = Time on Community Engagement$

$AD = Time on Administrative Activities.$

The workload of an academic for teaching and learning component on a single subject for a week is calculated as:

$$TL = [CN \times PR \times (0.5 + 0.5 CS/NS)] - TU + W \quad (2)$$

where,

$TL = teaching and learning workload$

$CN = the CONTACT HOURS per week$

$PR = the hours for PREPARTION required per contact hour$

$CS = the number of students (CLASS SIZE) in the class$

$NS = the NORMAL SIZE of the class section$

$W = the hours on WIL preparation and visits$

$TU = time saved by using a tutor (0.5 hr for each hr).$

The constant 0.5 and 0.5 multiplier of (CS/NS) in equation 2 provide the balanced division for work that increases in proportion to class size.

In general, the total workload that encompasses all components of work of academics for a week is

$$TW = \sum \{CN \times PR \times (0.5 + 0.5 CS/NS) - TU + W\} + RI + CE + \quad (3)$$

If a subject has more than the average contact hours per week, each additional hour only carries a unit weight (i.e. 1 unit for every hour).

When presenting a subject to multiple small groups, all the students in all groups are added and treated as one class size. In the case of team teaching, load is shared equally according to the number of academics. For simplicity, other workload factors such as work experience and nature of subject (difficult subjects) as advocated by (Parks, *et al.*, 1995) have not been included in the proposed model. The fairly homogenous offerings at this University of Technology and developmental nature demand a simplified modelling approach for practical implementation.

2.1 Automation

The essence of the workload model is to optimize and ease allocation of scarce academic human resources. The computation of individual workload of academics for each department and faculty is an enormous task which if not well managed could lead to additional workload burden for academic departments. Therefore, it becomes necessary to automate the workload calculation processes to reduce burden of computation and also to standardise the process and reduce computational errors that could arise from manual calculation.

The workload model algorithm as presented in equation 3 will be implemented in a business intelligence environment where the computation will automatically run for each academic in the University's database. The automation will in a nutshell involve the following processes:

- a) *Identify data sources*
 - ITS and CELCAT Time Table and Staff Biographical data
- b) *Create Academic Workload Database*
 - Develop database tables and relationships in a business intelligence environment
 - Develop extraction procedures to extract above data from ITS
 - Incorporate the Academic Workload business logic
- c) *Create software to capture other work load related data*
 - Research Related
 - Community Engagement
 - Administration
- d) *Reporting*
 - Reports to display workload on personal and departmental aggregated levels
- e) *Testing*
 - Test of data capture, extraction and reporting processes,

calculated as:

The University will be working closely with software development company IDSC, the developers of Higher Education Analyser (HEDA) business intelligence tool. At the end the workload model is anticipated to be made compactable with other business intelligence models of HEDA for integrated management information support system.

2.2 Reporting

Table 1 presents a snapshot of what the summarized workload report for each academic would look like.

2.3 Work allocation guideline

For fair allocation of work to academics, the following guidelines are provided to guide Heads of Departments and Deans.

The following points provide further guide to Deans and HODs for allocation of work at various academic departments.

a) *Departmental obligation load*: A load of between 2 and 7 hours per week for departmental obligations

b) *Research and community engagement projects*: Between 2 and 8 hours per week to be determined by HOD. There have to be evidence of registered projects with relevant directorate.

c) *Minimum workload*: 40 units per semester week,

d) *WIL activities*: One unit per hour for preparations and visits

e) *Preparation for teaching*: The hours of work required per contact hour, 3 units are used for lecture sections and 2.0 are used for laboratory sections. This provides for 1 unit preparation, 1 unit lecturing and 1 unit for assessment, administration, consulting etc.

f) *Normal Class size*: The ideal class size is regarded as the faculty class size average.

g) *Programme Coordinators*: The Dean designates academics to serve as programme coordinators within departments that have substantial numbers of students in either different specializations or levels of study.

h) *Service Departments HODs*: HODs of service departments are expected to utilize at least 40% of time on teaching and learning activities.

i) *Programme Departments HODs*: A load of 22 hours a week pertaining to administrative duties for National Diploma programmes, 10 hours for B.Tech and 5 hours for Masters programmes.

j) *Supervision of Postgraduate Students*: Between 2 and 8 hours per week to be determined by HOD depending on number of students.

Table 1. Workload report for individual academic

| PERSONAL DETAILS | | | | | | | | |
|------------------------------------|---------------|------------|-------------------|-------------|-------------|-----------|---------------|----------|
| Staff Number | | | | | | | | |
| Surname and Initials | | | | | | | | |
| Department | | | | | | | | |
| Subject Code/ Activity | Contact hours | Class Size | Normal Class Size | Preparation | Tutor Hours | Team Size | Load per week | |
| | | | | | | | Weighting | Load |
| Teaching and Learning | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Lab Practicals | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| WIL activities | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total Teaching and Learning | | | | | | | | 0.00 |
| Research | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total Research | | | | | | | | |
| Community Engagement | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total Community Engagement | | | | | | | | |
| Administration | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total Administration | | | | | | | | |
| Grand Total | | | | | | | | 0 |

HOD Signature

Lecturer Signature

Date

Date

Table 2. Load allocation by rank

| ACADEMIC LEVEL | T & L (%) | R & I (%) | CE (%) | ADMIN (%) |
|-----------------------|-----------|-----------|--------|-----------|
| Junior Lecturer | ≥ 80 | | | |
| Lecturer | ≥ 75 | | | |
| Senior Lecturer | ≥ 65 | | | |
| Assistant Professor | ≥ 65 | | | |
| Associate Professor | ≥ 65 | | | |
| Professor | ≥ 60 | | | |
| Research Professor | 0 | ≥ 90 | | |
| Programme Coordinator | ≥ 50 | | | ≥ 30 |
| HOD Service Dept | ≥ 40 | | | ≥ 40 |
| HOD Programme Dept | | | | ≥ 75 |
| Dean | 0 | | | ≥ 90 |

Table 2 provides a guide for distribution of workload of academics amongst the core functions of academics; teaching and learning (T&L), research and innovation (R&I), community engagement (CE) and administration (ADMIN). The workload distribution guide is with respect to employment level/rank of academics. Teaching and learning take precedence for academic staff at MUT irrespective of rank.

3 Results

3.1 Examples

Examples 1:

Mr Mthembu is a lecturer in engineering. He teaches three subjects A, B and C. Subjects A and B are theory-based. Subject A has 3 hours of contact in a

week and Subject B has 2 hours. The subjects have 120 and 66 student population respectively. Subject C is practical with 2 hours laboratory session in a week and student population of 45. Mr Mthembu is not involved with WIL visits, research and community engagement. He represents the department in X committee and the HOD has allocated departmental obligation load of 3 hours per week. What is his total workload assuming normal class size of 50 for the faculty?

$$\begin{aligned} \text{Subject A: } [3 \times 3 \times (0.5 + 0.5 \times 120/50)] &= 15.3 \\ \text{Subject B: } [2 \times 3 \times (0.5 + 0.5 \times 66/50)] &= 6.96 \\ \text{Subject C: } [3 \times 2 \times (0.5 + 0.5 \times 45/50)] &= 5.7 \\ \text{Total Teaching \& Learning Load} &= 28 \\ &\text{(75\% of time)} \\ &+ \\ \text{Departmental Obligation Load} &= 3.0 \\ \text{Total Workload} &= 31 \\ \text{Hours/Unit per week} & \end{aligned}$$

Examples 2:

Mrs Jackson is a HOD of certain department in Natural Sciences. Her department runs National diploma and B.Tech programmes. Mrs Jackson also teaches one subject A. For this subject, she has contact lectures with student for 3 hours in a week. The student population of her class is 70. She has a registered research project for which she commits 4 hours of time every week. What would be her total workload assuming normal class size of 50 for the faculty?

$$\begin{aligned} \text{Load for management of ND programme} &= 22 \\ &\text{Hours} \\ \text{Load for management of B.Tech Programme} &= \\ &\underline{10 \text{ Hours}} \\ \text{Total Admin Load for running her Department} &= \\ &32 \text{ Hours} \\ &+ \\ \text{Subject A: } [3 \times 3 \times (0.5 + 0.5 \times 70/50)] &= 10.8 \\ &+ \\ \text{Research Load} &= 4 \\ \text{Total Workload} &= 47 \\ \text{Hours/Units per week} & \end{aligned}$$

4 Conclusion

This paper presents an attempt at designing an academic workload model in the context of a developing University of Technology (UoT) in South Africa. Using actual hours modelling approach, a workload model that prioritises teaching and learning aspects of work of academics is proposed.

The focus of the paper is on the computational aspect of academic workload management. The broader context such as discipline-specific requirements, exceptions, individualization, power relation, gender dynamics and perceptions regarding some of the assumptions of the model would be dealt with in the broader workload management framework/policy of the University. The University is in the process of developing a framework that would incorporate various dimensions of this discuss of which this computational model is just one aspect.

It is hoped that the application of the model will contribute towards optimization of available human resources at the University and also provide a bias-free decision support system for executive management.

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