PERFORMANCE MANAGEMENT AND ACADEMIC WORKLOAD IN HIGHER EDUCATION

by

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ABSTRACT

This research project investigated the need for a method of determining an equitable workload for academic staff in higher education.

With the possibility of the introduction of a performance management system at the Cape Technikon it became imperative that an agreed, objective and user-friendly method of determining the workload of each academic member of staff be established.

The research project established the main parameters of the job of an academic staff member and their dimensions that would influence both the quantity and quality of work produced. They were established based on the views of a panel of educators drawn from a diverse range of disciplines.

Using the identified dimensions an algorithm was developed and refined to reflect the consensus views regarding the contributory weightings of each of the parameters' dimensions. This algorithm was tested and refined using a base group of academic staff who were identified by their colleagues as those whose workload could be considered a benchmark for their discipline.

The most significant result of the research programme is the agreed algorithm that can form the basis for a performance management system in higher education. The user interface that was developed at the same time reflects the transparency of the system and allows for it to be adapted to the needs of various groups of users or individuals within an organisation.

On the basis of this research it has been established that a system for determining an equitable workload which encompasses an extensive range of parameters can be developed using a participatory approach. Using a significant sample of academic staff as a basis, it would appear that the system is valid, reliable, useful and acceptable to academic staff in the context of a performance management system.

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Finally, I wish to pay tribute to Peter Haude who managed to solve what appeared to be insoluble problems with the web-based interface with such calm and ease.

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PREFACE

The motivation for this research was provided by an official memorandum issued by the Cape Technikon on 19 January 2000, under the signature of Mr J.A. Coetzee, entitled "Performance Management System", from which I quote certain extracts.

"As you would know, the Cape Technikon has, for many years, sought to find a generally acceptable system of rewarding merit among staff. The most recent system fell into discredit to such an extent that the Central Merit Committee requested the Director: Human Resources to facilitate finding a satisfactory solution."

"One of the requirements of developing a new system of merit/reward based on performance is that it has to be contextualised/localised properly. This means that each section has to resolve its unique circumstances/requirements within the new system. Since a merit/performance management system impacts on each worker, the development of a new system also requires every worker's involvement."

"A new system should be developed as much from the bottom up (buy-in, refinement of implementation) as it is guided from the top (leadership, broad concept development)."

It was to resolve the "unique requirements" of the academic staff, and to ensure that the process was "bottom up" that this research project was undertaken. It is hoped that the results will gain broad acceptance within the Cape Technikon and form the basis for the introduction of a performance management system for academic staff.

1. PERFORMANCE MANAGEMENT IN HIGHER EDUCATION

1.1 Introduction

The South African Higher Education system is in a state of rapid flux. Having been isolated for so many years from the mainstream sectoral developments overseas, the system within South Africa is rapidly coming to terms with the changes and pressures that other systems have had to deal with years, and in some cases decades ago. Wergin (1994, pg 1) writing about the situation in the United States nearly ten years ago, says: "External pressures for change in higher education are perhaps stronger now than at any time in the last fifty years." He goes on to cite falling state financial support, spiraling tuition costs, an increasingly sophisticated and skeptical public and a hostile press as some of the reasons for higher education's vulnerability. "We are sheltered, spoiled folk with cushy jobs, the perception goes; we probably don't work very hard, and if we do, we're more interested in narrow, inaccessible scholarship than in work that addresses society's problems, and we're more interested in specialized undergraduate education that fits those narrow specialties than we are in teaching undergraduates." (Ibid, pg 1)

This translates into demands on managers in higher education to ensure that their constituents are getting value for money, that staff (particularly academic staff) are working more productively, and that their institutions are responsive to the changing demands placed upon them. Whereas South African universities, by virtue of their higher status, greater autonomy and more extensive financial resources, are better able to weather the pressures, this is not true of the newer, more financially dependent and more centrally controlled technikon sector.

In attempting to respond to these pressures, technikons often do not have the management experience or the resources that allow for a considered and well-researched response. Many times they are pressured into restructuring exercises, repositioning initiatives, cooperative agreements, franchising of courses and curriculum changes only to discover that the implications of these changes have far-reaching, and often-times, unanticipated negative consequences.

One major pressure on higher education is the demand for greater productivity in the wake of budget constraints, increased enrollments and more explicit social demands placed upon institutions. Technikons have not escaped this pressure. In recent years we have seen technikons being required to engage in relevant applied research, to reach out with community projects, to offer post-graduate degrees and to restructure curricula to conform to the requirements of the new National Qualifications Framework and Outcomes-Based Education (OBE). It is inevitable that the work that academic staff are required to perform will come under scrutiny. Demands will be made on institutional managers to manage more effectively the performance of their staff so as to achieve higher levels of productivity and the attainment of an ever-increasing number and range of institutional goals. Margetson (1997, pg 123) puts this forcefully in the following terms:

> "If higher education was ever in an ivory tower, it is certainly not so now. Earnest utilitarian cleaners have scoured out any vestiges of imagined ivory, leaving the cogs of the internal machine bared and geared tightly to the service of national economies. This has been legitimated largely in the guise of increased quality assurance procedures... .
>
> In education the procedures of assessment, appraisal, evaluation, staff development, management itself and most recently and forcefully legislation, all bear witness to the grand and extravagant surveillance of ourselves and our children in ways so invasive and persuasive we think of them as normal life."

This pressure was particularly acute in the late 1980s and the early 1990s in the United States of America.

> "Institutions need to examine, for example, whether faculty members are spending their time on activities that coincide with institutional priorities or whether some faculty members might be more effective in programs other than their current assignments. Although these questions may anger some, the answers provide a basis for dealing with productivity issues in a time of tight budgets, while addressing the need for quality." (Layzell, 1992, pg B2)

In the same article, the author, who is described elsewhere (Jordan & Layzell, 1992, pg 4) as a "former research and fiscal analyst of the Arizona Joint Legislative Budget Committee" states that

> "...policy makers have the right and responsibility to know, among other things, how faculty at state institutions spend their time and to demand efficiency and effectiveness in all areas of colleges' operations". (Layzell, 1992, pg B2)

His comments appear to emphasize that looking at how academic staff spend their time is more a fiscal concern than a concern to align the interests of the staff with the interests of the institution, although that is his stated aim. However, the metaphors and sub-text ("productivity", "tight budgets", "the right...to know", "demand") indicate persuasively that the former is the driving force behind any such study. This, as the primary aim, is further reinforced by his later statement:

> "Of course, when legislators start looking at how faculty members spend their time, faculty members and administrators react defensively, raising concerns about 'institutional autonomy'... Their underlying concern, however, is whether studies of faculty members' productivity will lead to budget cuts." (Layzell, 1992, pg B2)

Such statements only serve to reinforce the fears of academic staff members and engender resistance to any form of workload determination. Headline reports of disputes over workloads (*"A Novelist Quits at Temple University Following a Dispute over his Teaching Load*", The Chronicle of Higher Education, May 1997, vol 43 pg A12) fuel this disquiet.

South Africa is starting to feel the effects of pressures that other higher education systems have been experiencing for a number of years. Increasingly calls for greater productivity and the more cost-effective deployment of resources are being heard. The recent Council on Higher Education Report, entitled "Towards a New Higher Education Landscape: Meeting the Equity, Quality and Social Development Imperatives of South Africa in the 21st Century" makes numerous references to these issues.

> "No higher education institution can assume that its track record with respect to equity, quality, social responsiveness and effectiveness and efficiency is beyond dispute and self-evident."
>
> "Thirdly, in the same way, efficiency and effectiveness in the achievement of missions and goals by higher education institutions are not in competition with quality, equity or democracy. A lack of institutional effectiveness compromises accountability to the public and government in relation to the investment of public resources. The costs of institutional inefficiency are ultimately borne by the public and especially by parents and students from working class and rural poor backgrounds."
>
> "Efficiency challenges are often closely tied to quality measures as well as sound planning measures both at institutional and system levels."
> (Council on Higher Education, 2000, pg 21)

Whatever the fears of the academic community, such pressures are here to stay. Mingle and Heydinger (in Wergin, 1994, pgs 87-88) capture this sentiment in the United States.

> "From this perspective, we draw two conclusions. The change in public attitude about private benefits compared to public benefits is relatively permanent. Second, given the structural and demographic forces facing state and federal governments, higher education's share of tax revenues is likely to continue to decline. At best, higher education will match, not exceed, growth rates for the economy as a whole. The result will be continuous pressure on higher education to improve its cost effectiveness and productivity.
>
> As a result, we can continue to expect public pressure about teaching loads, calendars, and general concern that instruction is being neglected in favor of research. Expect continued legislative pressure on institutions to increase teaching loads and to constrain tenure granting ... Faculty salaries constitute the second largest expenditure in the budget of many states, after teacher salaries. Furthermore, the flexible working conditions and job security afforded most regular faculty are at great variance with those of the population as a whole, even with other professions."

Part of the problem lies in the nature of the discourse between higher education and its constituencies. To describe the complex nature of the higher educational enterprise in terms of full-time equivalent students per instructor or the research output per academic staff member is not helpful to the cause of higher education. Higher education is not simply about lecturing to undergraduate students or writing research articles: it is a multifaceted activity with a surprisingly large number of interdependent variables which affect both the quantity and quality of the output produced by academic staff members.

But if managers in higher education are being called to account and required to explain how they are managing their expensive human and physical resources, then they require management information systems that will generate the correct information to apply these resources in the most effective manner for the achievement of the institution's educational goals. While for some academics the thought of being managed is anathema, there are those who feel that the effect may not be entirely negative.

Paul Ramsden, a senior Australian academic and a noted researcher, expresses his belief in the value of performance management in Higher Education.

> "I am sure that performance-based funding of teaching using performance indicators to measure achievement will have a powerful and positive influence on the standard of teaching and learning." (Ramsden, 1999, pg 3)

What is disquieting is his comment in the same article that the indicators to which this performance-based funding should be linked are aspects such as "course effectiveness – first preferences, retention and completion rates, CEQ [Course Effectiveness Questionnaire] scores, graduate outcomes and the like."

How is higher education to react to these pressures, particularly those around issues of workload and staff productivity?

> "Documenting adequate productivity and quality in teaching, research, and public service – and establishing bases for measurement and evaluation – are gargantuan tasks that will require much cooperation and patience from college administrators and faculty members, as well as from state-government officials. But the task must be undertaken, and understanding the dynamics of faculty workload is the first step in this long process." (Layzell, 1992, pg B3)

But Margetson (1997, pg 124) warns that this process will not be undertaken against a neutral environmental and institutional backdrop.

> "Heavy increases in workloads, reports of increasing work-related stress, falling morale among many academic staff, and deteriorating conditions of work – both intellectual and material (for example the abolition of tenure in the UK, persistent attempts to 'redefine' it in Australia, and the tortuous process of achieving it in the US; shortages of library and other resources, and the deteriorating conditions of many buildings) – are not encouraging signs. Quality assessment procedures, with their onerous requirements for documentation and reporting, are not separate from this."

For "quality assessment procedures" one could equally well read "performance management procedures". Any discussion of performance management in higher education must, therefore, take into account the suspicions and fears of academic staff increasingly under pressure from all sides to be more productive, more accountable and more responsive to the demands of a technologically advancing society.

One of the ways to allay their fears and at the same time provide the necessary information about what academic staff actually do, is to negotiate an acceptable method of describing all the activities that academic staff are called on to perform and to quantify these activities in terms of the time required to perform them to an acceptable standard. This information could

then be used as a starting point to input into a performance management system that acknowledges the range of activities required of academic staff and at the same time directs them within the explicit framework of departmental and institutional goals.

> "As faculty work changes, so must our documentation of it change – and the sooner we look to some of the alternatives ...the better." (Wergin, 1994, pg 3)

1.2 Performance Management in Higher Education

Since the context of the project described in this thesis is higher education, it is not the intention in this section to deal with the broad concept of performance management in any great depth. This section deals specifically with performance management as it has been applied in Higher Education.

Performance management is a concept that is relatively foreign to education, having its origins in industry and the commercial environment, and is therefore generally viewed with a high degree of suspicion by academics, particularly in higher education. This view is often reinforced by the fact that there have been attempts to import management systems from industry into higher education without making the necessary adaptations for the difference in context.

> "It is not proven that the methods of management of British industry are a solution to the needs of institutions whose performance - in teaching, scholarship, research and retraining - are fundamental to the social, economic and cultural regeneration of the country." (Warner & Crosthwaite, 1995, pg 85)

In a review of performance management systems as applied to Australian universities, Hughes and Sohler come to the following conclusion:

> "...the implementation of many of the recommendations drawn from the private enterprise experience of performance management is difficult in the university context." (Hughes and Sohler, 1992, pg 54)

This questioning of the applicability of aspects of management systems to higher education becomes even more pronounced when the results of their application are applied to aspects such as remuneration, tenure and promotion. Many feel that the systems fail to take account of the very nature of educational process.

> "It is important to establish the point, so little understood by laypersons, that workload consists of far more than time spent in the classroom. Teaching entails careful preparation, consultation with students, and evaluation of individual work – all of which takes far longer than the 50 minutes we stand in front of class. Teaching also involves keeping current with one's discipline, a prerequisite for sharing the latest materials with students." (Winkler, 1992, pg 40)

This view is echoed by Zheng (1992, pg 45) when he says:

> "All those types of institutional data ... fail to reflect the complexity of faculty activities as they are based on untenable assumptions".

Systems which fail to recognize the complex nature of the educational process can in fact be counterproductive. Lonsdale (quoted in Hughes and Sohler, 1992, pg 54) comes to the following damning conclusion:

> "The literature shows that most current systems of performance appraisal or evaluation do not lead to improved performance. It does show however that performance appraisals can be dysfunctional, lead to reduced productivity, and create morale problems. The outcomes of appraisal have a significant, often negative impact on the climate of the organisation and the commitment of its employees."

Performance management, in whatever form, should therefore be approached with informed caution.

The attraction of linking reward systems to some form of performance management is alluring, but may well be misplaced.

> "Experience in the area of total quality management, for example, suggests that an undue focus on the individual (through such mechanisms as annual increments dependent on individual performance appraisals) is counter-productive." (Margetson, 1997, pg 128)

Such rewards systems often do not focus on the time and effort required to perform an activity (such as teaching) well, but only on the output of that activity. In the case of teaching, that output might be in terms of student pass rates, student attrition rates or some scale of student satisfaction with the course. However, if the institution values the activity (in this case, teaching), it needs to recognize the amount of time required to perform that activity with excellence.

> "Reward systems are not designed to support the additional time that faculty need in order to incorporate assessment and continuous improvement into the classroom." (McGourty,1999, pg 394)

There is also evidence to support the view that workload and quality do have a relationship, and that this relationship might well be inverse.

> "Its report [The American Association of University Professors' report] suggests that there is a 'positive relationship between less teaching and better teaching'." (Magner, 1994, pg A18)

Thus a method of determining academic staff workload and the amount of this time spent on teaching might necessarily inform any judgement about teaching quality and the debate about quality improvement through performance management. Put simply, it might be unreasonable to expect academic staff who are overworked to be able to do much about improving the quality of their teaching without at least reducing their workload to some extent. This view is echoed by Brian Everett, the Association of University Teachers Manchester regional officer, who advises:

> "you could not go on increasing workloads and expect standards to remain the same at the end of the day." (quoted in Santinelli, 1994, pg 36)

The effects of increasing academic staff workloads are becoming evident. In a recent report on the Technical and Further Education (TAFE) sector in Australia, the unnamed reviewer (Campus Review, 1999, pg 5) states the effects that this is having.

> "But it [the report] says the major concern of education workers was the damage to the quality of their work. Almost nine out of 10 said they have had to cut corners in preparation and marking while 95 per cent said they were unable to give their students enough individual attention. Similarly, 94 per cent said they were required to do too much administrative work. More than 90 per cent said they did not have enough time or energy left for professional development. ...We cannot continue to maintain quality by placing unreasonable and unsustainable demands on the educational workforce."

However, the idea of performance management in higher education is probably here to stay (George, 1987). In 1991, the New York Comptroller, Edward V Regan, proposed, amongst other things,

> "that each full-time faculty member prepare an annual performance plan that includes research and service activities, and then submit an annual summary of accomplishments that correspond to the plan." (Cage, 1991, pg A1)

But should performance management in higher education be based on output measures, such as pass rates, attrition rates and research outputs, or are there other measures of performance that would provide information upon which to base a performance management system? Schermerhorn, Hunt and Osborn (2000) suggest that for jobs where the output may be a function of group effort, or may be extremely difficult to measure, or may be difficult to link to a particular individual over a particular period of time, "activity measures" are more appropriate. They state:

> "The difficulty of obtaining output measures may be one reason for using activity measures." (Schermerhorn, Hunt and Osborn, 2000, pg 138)

If output measures traditionally employed in higher education as indicators of performance are open to question, then there is a strong argument to explore the usefulness of other sources of information related to key activities.

It is also clear that in the absence of reliable and useful information, managers in higher education will not be able to manage the performance of their staff, their department or their faculty. Baird makes this point forcefully when he says:

> "Without it [accurate information] management will make decisions that misdirect and obstruct good performance." (Baird, Beatty and Schneier, 1982, pg 12)

Management information systems in higher education are generally underdeveloped, and focus on readily accessible measures of institutional, rather than individual, performance. If performance management is to be introduced with any reasonable likelihood of success, it is necessary that the range of management information be extended to include information about activities at a departmental and individual level. If managers at the institutional level can function more effectively when provided with information regarding the performance of the institution as a whole, then it follows that managers at the faculty and departmental level can only manage with the provision of similar information regarding the performance of their staff. One of the inputs into such a management information system should be the determination of the workload of each staff member in terms of the main functions that the institution expects him or her to perform. This would, in turn, be supplemented by qualitative information about how well the individual has performed in the areas identified by the workload determination. Such information would assist the departmental or faculty managers

in aligning the activities and outcomes of their department or faculty with the goals and mission of the institution -- one of the primary purposes of performance management.

> "These data [concerning faculty workload] are also being used more frequently in the planning process, particularly in terms of assessing the degree to which individual departments are contributing toward meeting the overall mission and goals of the college." (Mayes, 1998, pg 149)

It is uncertain which term should be applied to the process of workload determination. Traditionally management information systems have been taken as referring to

> "an organized method of providing past, present, and projected information relating to internal operations and external intelligence. It supports the planning, control, and operational function by furnishing uniform information in the proper time-frame to assist the decision maker." (quoted in Watson, Houdeshel and Rainer, 1997, pg 11)

This terminology, management information system (MIS), appears to fit more closely than the definition of decision support systems (DSS),

> "computer-based systems that help decision makers confront ill-structured problems through direct interaction with data and analysis models" (ibid, pg 11),

and is preferred to the term, executive information system (EIS),

> "a computerized system that provides executives with easy access to internal and external information that is relevant to their critical success factors." (ibid, pg 3)

If performance management is likely to be a driving force in Higher Education in the immediate and foreseeable future, on what principles should the management information system that forms the foundation for performance management be based? How can the determination of workload in relation to academic performance reflect these principles? It is suggested that there are at least six principles that any such management information system should incorporate and which should be directly reflected in the development of a workload determination procedure. These principles will be explained in terms that relate specifically to the determination of academic workload since this is the focus of the project. The six principles are:

- validity
- reliability
- transparency
- adaptability

- acknowledgment of performance
- negotiation of mutually agreed tasks and outcomes

These principles approximate quite closely to the criteria suggested by Windham (1990): logic (transparency), comprehensiveness (validity), clearly communicable standards (negotiation of mutually agreed tasks and outcomes), and sufficiently stable measures (reliability) so that evaluation can be conducted and incentives developed (acknowledgement of performance) to achieve institutional missions. They also link to at least three of the requirements for an Executive Information System, proposed by Eason (1992, pg 12), namely validity, reliability and adaptability (and two of the remaining principles are specific to workload determination – acknowledgment of performance and negotiation of mutually agreed tasks and outcomes.) The omission by Eason of the principle of transparency is somewhat surprising, but can be accounted for by the fact that he is advocating complex computer-mediated Executive Information Systems, whose mathematical computations might be beyond the capability of the average executive to understand. However, in the same compilation of papers, Angehrn (1992, pg 135) does make the point that the manager should be able to

> "define and monitor the different criteria involved in the decision, as well as assign weights to the single criteria,"

which equates to the need for transparency in the way in which the various calculations are performed.

VALIDITY

For any determination of academic workload to be useful or acceptable, it requires a high level of validity. It must accurately and comprehensively describe both the full range of activities or tasks that an academic staff member might be required to perform and the complex interrelationship between these tasks as they affect the time required to perform them. Failure to do describe either will seriously compromise the usefulness and acceptability of any proposed workload determination system.

> "Many jobs are undoubtedly complex. They have to deal with multiple input and multiple output. The challenge in developing valid performance measures is to identify the data which best describe what is to be accomplished on the job. It is better to try to deal with the complexity than to ignore it and make serious mistakes in evaluating performance." (Baird, Beatty and Schneier, 1982, pg 17)

RELIABILITY

Any proposed workload determination system must be so designed that it produces consistent results. This means combining sufficient objectivity in terms of quantitative data and sufficient freedom in terms of qualitative data that the users of the system will believe that the results are quantitatively reliable but also that they capture the qualitative differences that may be present in their range of individual tasks.

TRANSPARENCY

If the system is to gain wide acceptance it is desirable that the process by which workload determinations are arrived at be evident to all the participants. This poses a particular challenge in terms of the interface development, since it requires that mathematical operations on the input data be apparent to the participants so that they can see the effect that certain inputs have on the final determination. It also requires that all specifications regarding aspects such as the length of time allocated or the weighting factor used must at all times be visible.

ADAPTABILITY

Since the nature of the academic task varies from discipline to discipline, individual to individual and even for one individual over time, it is imperative that the system can be adapted to the circumstances of the individual (Baird, Beatty and Schneier, 1982). This implies that even if normative default time allocations and weightings are agreed upon and verified, provision must still be made for individuals to exercise personal control over the acceptance or modification of these predetermined specifications. This requirement is surprisingly supported by Vermeulen (1996, pg 5) who reports that

> "This premise of equal time norms regardless of field of study was welcomed by the majority of academics. The accounting model, however, allows for deviation from the norms if necessary."

The requirement for adaptability, linked to the requirement of transparency, makes the design of the interface particularly difficult. It also requires that any subsequent reporting of the results of the workload determination must alert a third party to the fact that default values have been modified according to the perceptions of the user.

ACKNOWLEDGEMENT OF PERFORMANCE

If the system has validity it implies that all tasks have been adequately described. If the system is to acknowledge performance then a reasonable allocation must be apportioned to all tasks, even if this allocation is relatively insignificant in terms of the total workload determination. Although a specific allocation may be so small as to have little overall effect on the individual's final workload determination, the psychological effect of acknowledging that the task is valued by the institution is of considerable consequence.

NEGOTIATION OF MUTUALLY AGREED TASKS AND OUTCOMES

The system should facilitate the negotiation of mutually agreed tasks and outcomes. The distinction between these two aspects is sometimes overlooked, and attention is paid only to outcomes. While it is relatively easy to negotiate outcomes in areas such as research (number of publications, number of conference presentations, projects undertaken), it is much more problematic to focus only on outcomes in areas such as teaching. In this area it is necessary to focus on mutually agreed tasks (teaching so many classes, being available for consultation with students for so many hours per week, coordinating so many subjects) which can then be subsequently evaluated using qualitative data. By presenting all the possible tasks and outcomes, an academic workload determination system should facilitate the negotiation of these tasks together with the means by which they will be evaluated, as well as the identification of specific outcomes that can similarly be assessed.

1.3 Conclusion

These six principles, then, are the foundation upon which the workload determination programme will be developed. It is important, however, to see the place of workload determination in the entire process of performance management in higher education. The determination of academic workload has been described as a necessary component of a management information system, which in turn will inform the process of performance management. Performance management will require other inputs if it is to be acceptable to all the role players and successful in improving the "fit" between what academic staff do and the requirements of the institution and the higher education system. The other components of the

system will be both quantitative and qualitative in nature. It is not the intention of this project to design all the components of the performance management process.

It will certainly be necessary to obtain quantitative information about the performance of staff members over time in areas such as research output. In addition, it will be necessary at the departmental and/or faculty level to obtain quantitative data about income generated and expenditure incurred. This will to some extent determine the manner in which the activities of staff members are modified to ensure that departments and faculties remain financially viable within the constraints determined by the institution. However, it is undesirable to take this quantitative financial analysis to the level of the individual staff member. Whereas it is highly appropriate to consider financial viability at the level of the department, it is inappropriate to require every staff member to balance their personal cost to the institution against the relative income they generate through staff fees, research income and other sources. Many benefits to the department, in terms of aspects such as departmental leadership and administration, committee involvement, community service and service to the profession may not generate income for the individual or even the department, but certainly contribute to the overall effectiveness of the department. Financial contribution to the department or the institution should not be considered as a major input into the performance management of the individual.

An aspect that certainly would require attention at the individual level is the determination of indicators of quality in those areas highlighted by the workload determination. In parallel, then, to the determination of academic workload, should be the development of indicators of quality related to all areas of academic work. Here the determination of workload can assist in identifying the sorts of tasks that could be required and which, in turn, would require qualitative data to support their effective management. Some of them are obvious: quality of preparation, teaching, assessment practices, consultation and research output, but others may not be as obvious and require careful analysis of the academic task to bring them to light. In this way the determination of academic workload may not only provide the range of tasks required of an academic staff member, but may also signal areas which require qualitative analysis of performance which in the past have been overlooked. It could provide the framework for the development of qualitative indicators of performance that would

complement the workload determination. Used together, workload determination and indicators of performance quality would make up the basis for a comprehensive and logical performance management system for higher education.

2. APPROACHES TO PERFORMANCE INDICATORS AND WORKLOAD DETERMINATION

One of the problems in considering the issue of academic workload, is to decide what activities should be included in a definition of "workload". Some of the measures used consider a narrow definition that includes only the number of assigned teaching hours or their equivalent in other activities, such as research. However, most definitions are broader, including all activities that might be assigned to academic staff by the institution. Such definitions would embrace

> "preparation for teaching, classroom instruction, constructing and scoring examinations, reading and grading papers, research and/or creative work, directing graduate theses and dissertations, providing professional services, guidance and counseling, administrative duties, professional reading, committee work, and participation in extra-curricula activities." (Yuker, 1984, pg 1)

The question of how to arrive at indicators of performance for academic staff in higher education is approached from a number of different perspectives. One of the most common is to locate individual performance within a range of measures of institutional performance. In a comprehensive summary of these indicators from a number of different countries, Kells (1993) presents a wide range of such institutional indicators, only some of which are directly applicable to academic staff. It is significant to note that the list of Recommended Indicators and Operational Definition for Australia (Kells, 1992, pg 131-137) include:

Equivalent full-time student load (which is the sum of all subjects taught, in terms of number of students per subject multiplied by the relative workload rating of each subject and divided by the total workload rating for a full year of study). In the light of the argument already presented this must be deemed a very crude and inaccurate measure of workload, since it ignores the complex nature of the academic task. [It is, however, interesting to note that in the course of the research project reported in this thesis, the author encountered a faculty at the Cape Technikon that was using almost exactly this measure to produce a single figure that was taken to represent the workload of each staff member. It was partially the rejection of this crude and highly misleading measure by the staff of that faculty that encouraged the author to pursue this project in order to offer disillusioned staff an alternative and credible system of workload determination.]

Perceived teaching quality (which is the average rating across the following dimensions of teaching performance: general quality of teaching, clarity of goals, appropriateness of student workload, appropriateness of student assessment and emphasis on student independence);

Research higher degrees completion rate;

Number of research grants;

Average publication rate (which includes books and monographs, refereed journal articles and published conference papers);

Productivity rate of other original works (which includes public broadcastings and recordings, registered patents, inventions or designs and commercial and other published computer software).

They are grouped together with other performance indicators for the institution such as

Academic activity cost per student

Total recurrent cost per student

Program completion rate

Graduate employment

Student progress rate.

The fact that indicators of teaching (including research and other related activities) are juxtaposed with other measures deemed to be indicators of institutional performance (read "efficiency" or "productivity") must give some cause for concern as to their origin and the purposes to which they would be put.

The picture in France is very similar (Kells, 1992, pg 139-142). Under the heading "Teaching and Student Indicators" are listed:

Number of students per number of tenured teachers

Number of students per number of statutory teaching hours

Real availability of teachers

Number of teachers who have taken on responsibility for teaching supervision

Success rates by study programme.

While these are largely at the level of institutional indicators, it is not difficult to see how these could logically be extrapolated to become indicators of individual performance. Like the performance indicators suggested for Australian higher education, they appear to reduce the complexity of the academic task to a set of numerical outcomes which capture none of the inherent quantitative and qualitative differences to which the educational process gives rise, and are based on an inherently narrow definition of academic workload.

The equivalent list for the United Kingdom, produced by the Committee of Vice-Chancellors and Principals and the University Funding Commission (Kells, 1992, pg 143) fails even to address the issue of teaching, and is content to consider only financial indicators such as full-time equivalent student load and the ratio of full-time equivalent students to full-time equivalent teaching staff. (The issue of "full-time equivalent" students will re-emerge in other indicators of performance. It is significant to note that these are essentially financial indicators in terms of fees and subsidies generated and have no direct relation to the nature of the teaching provided.)

The situation in the United States is not significantly different. Middaugh (in Gaither, 1999), in a chapter entitled "Instructional productivity of systems", refers to teaching loads as a measure of productivity. He further elaborates that teaching loads can be determined in terms of student credit hours per total full-time equivalent faculty, while other measures that could be linked to productivity include direct instructional expense per student credit hours. The emphasis on financial indicators as measures of productivity should signal a warning as to the ultimate purpose of such indicators.

Mayes, in reviewing the approach to workload determination in US Community Colleges, suggests that there are two main sources of data. The first is derived from existing staff and student administrative records and provides data that is useful in calculating

> "various student/faculty ratios, in estimating instructional costs, and in describing individual teaching loads" (Mayes, 1998, pg 146).

The second uses faculty self-reported surveys that typically describe how faculty spend their time on a weekly basis. However, it appears that academic administrators have a strong preference for a formula approach to faculty workload determination (O'Shea, 1986, pg 20).

The general picture in terms of the nature of the indicators of performance recommended for academic activities in higher education is a rather disturbing one. It is evident that most of them are based on financial considerations, and those that are not are dependent on the reduction of teaching, research and community service to a series of simplistic ratios or output measures which completely ignore issues of process and quality.

There are, however, a number of interesting attempts to rectify the situation, using the broader, encompassing definition of academic workload. While not widespread, they will be dealt with in some detail since they help to inform the direction and nature of the present study which aims at producing a fully comprehensive list of academic activities that can, in turn, be linked to workload determination.

> "Formulas, however, have been devised that assume that the actual teaching load of faculty members varies at the different levels of study due to the non-class faculty time required by students and for preparation and evaluation activities. For instance, students working on their doctoral dissertation require more faculty time than most undergraduates in basic instruction courses. A formula assigns different weights for calculating faculty teaching loads at different instructional levels based on student enrollment data. The weights are established on the basis of individual institutional discretion, and there is no unified weighting system (Gross, 1973; Meisinger and Dubeck, 1984; Miller, 1964). According to an AAU institutions report in 1982-83, student credit hour weighting factors in California were 1.0 at lower divisions, 1.5 at upper divisions, 2.5 for masters' graduates, and 3.5 for Ph.D. graduates while the weights were 1.0, 1.0, 1.5 and 1.5 in Minnesota and 1.0, 1.7, 3.92 and 6.06 in Wisconsin respectively (Meisinger and Dubeck, 1984, p. 97). At the University at Albany, the weights are 1.000, 1.111, 1.667 and 2.500 for the different levels of instruction.
>
> All those types of institutional data mentioned above seem to be useful for planning and budgeting, however, they fail to reflect the complexity of faculty activities as they are based on untenable assumptions. Yuker (1984) pointed out that they could only be used as supplements to other types of measures. Yet they have been and are still being used because of their availability and their seeming meaningfulness. Further, these measures have been treated individually in the study of faculty workload, one question to be answered is whether they would provide better indication if they are combined together." (Zheng, 1992, pg 45)

The limitations of basing workload calculations only on student numbers and contact hours are pointed out by the same author, when he says:

> "The difference between general faculty workload policies and specific teaching requirement calculations is that the former are statements of guidelines or goals while the latter are operationalized calculations based on a methodology that utilizes student enrollment data as the driving variable. ...Faculty activities in research and service are neglected." (Zheng, 1992, pg 46)

An interesting approach used in United States Community Colleges is described by Mayes (1998, pg 149):

> "The Community College System has been collecting faculty workload data for over 10 years. The process consists of the faculty completing a Distribution of Effort Agreement Form (DOEA), which is administered by the system office. Each faculty member is required to estimate the total number of hours he or she plans to work per week the following academic year and to include the estimated percentage of time to be devoted to the several designated instructional areas. ...Specific data collected on the DOEA include the percent of effort faculty expend on the following broad areas: teaching (including class preparation and grading); student guidance and advising; continuing education and community service as related to the college program, and community service. The average weekly service hours, the number of full-time faculty by rank, and the percentage of time they spend in instruction, research, and service are also determined."

This system would seem to be a significant improvement over systems which rely entirely on centralized administrative data, but it appears to suffer from the fact that it is entirely self-reported, with little if any control over the allocations given by the individual for the activities specified.

Closer to home the University of Stellenbosch has two interesting systems, one operating in the School of Management, and the other in the Department of Industrial Psychology. The School of Management has a credit system that includes activities **other than teaching**, on the stated assumption that all staff contribute fairly and evenly to the departmental teaching load (Kredietstelsel vir Akademiese Personeel, undated, pg 1). These other activities are allocated credits and staff members are expected to accumulate a minimum of 120 credits in addition to their teaching load. The credits are as follows:

Promoter: PhD	60
Co-promoter: PhD	25
Study leader: M thesis	25
Study leader: M half-thesis	15
Study leader: Project	7
Liaison staff member: Project	3
Article: Subject Journal: International (refereed)	50
Article: Subject Journal: Local (refereed)	40
Article: Conference proceedings: International (refereed)	30
Article: Conference proceedings: Local (refereed)	20
Article: Non-refereed subject magazine	10
Presentation: at international subject conference	20
Presentation: at national subject conference	10

Although the credit value could not be directly equated with notional hours allocated to these specific activities, nevertheless their importance was useful in determining the relative allocation of time to particular research activities, described in detail in a later section of this thesis. (It is interesting to note that the motivation for the introduction of this credit system appears to be financial, since financial rewards are given if 150 credits are exceeded in any one year.)

The Industrial Psychology Department at the University of Stellenbosch (Calitz, 1996) developed a system that tries to capture more of the complexity of the academic task, but without allowing any individual freedom in the allocation of time. There are some strange, and seemingly arbitrary allocations such as class administration, tests and examinations – 1 hour per 5 students per class period – irrespective of the number of tests and the nature of the student's answers. The system does not appear to capture the actual complexity of the course as it is offered, but rather tries to reduce it to the sorts of factors previously identified as inadequate. The system appears to favor administrative uniformity rather than attempting to capture the real complexity of the interrelationship between factors.

Another system for the determination of academic workload has been devised at the University of Pretoria. Using a questionnaire to staff to obtain the base information, weighted averages were calculated for 27 different activities associated with the instructional process (Vermeulen, 1996, pg 8). A particularly complex matrix produced 243 time norm values for the model, which took into account a variety of factors such as the level of the subject,

preparation time, different forms of assessment (both setting and marking), the nature of the instruction provided and the size of the group. Vermeulen states that the procedure appears

> "to be very complicated but once realistic and acceptable time norms are set it becomes a simple accounting procedure that can be executed on a PC in a very short time period (30 minutes)." (Vermeulen, 1996, pg 18)

As will become apparent, the procedure proposed by Vermeulen closely parallels the procedure that evolved in the current project, although the research methodology and validation process differs markedly. However the system described deals only with a single component of academic workload, namely, teaching. The reason for this appears to be the attempt to link this procedure for workload determination directly to funds generated through teaching. Other activities, which do not generate student fees or government subsidy, are therefore excluded. Since this violates the fifth principle upon which the current project was based, namely, the acknowledgement of performance (see section 1), it was considered an interesting but incomplete attempt to capture the workload of an academic member of staff. What it did demonstrate was that the methodology for the current project was sound and could be employed to produce the desired results.

In contrast to the carefully devised schemes outlined above, the author encountered a system for the determination of workload that had been devised by a staff member at one institution, frustrated by the lack of appreciation for the amount of time that postgraduate research supervision and advanced research required. His system (Slatter, 1998) indicated that he was working 13722 hours per year (which equates to a 320 hour week, or the work of 6.4 lecturers!). What this illustrates is that the determination of allocations and weightings for specific activities cannot be left to individuals, however well-intentioned, if the results are to have any validity. The fact that using unscientific formulas can produce meaningless results is reflected by some more humorous responses (see "*Yet Another Voice on Educational Reform*" and particularly "*Milton's Well-Point Average*", in Fisch, 1995, pgs 64-68; 72-75).

Methods to determine academic workload have as their basis the need to understand how faculty allocate their personal resources, how departments allocate their human resources in order that through this understanding can come a better manipulation of how they are deployed (Jordan, S.M., in Wergin, 1994, pg 15). How to arrive at an acceptable method of

determining academic workload is perhaps the most difficult task, and one which leans heavily on finding an acceptable research methodology.

This view is reflected by Zheng, in his comprehensive analysis of existing approaches to workload determination. At the end of his in-depth review of the system at the University of Albany, which did not succeed in bringing about significant improvements in the manner in which academic staff and departments were managed, he arrives at this conclusion:

> "One reason for the insignificant correlation between the formula [for determining the workloads of academic staff] and allocation decisions is that the formula is not considered appropriate and effective by administrators with regard to approximating the full range of faculty workload as the formula is based solely on student enrollment data, such data represent only the aspect of instructional load. In addition, the formula cannot adapt to the different forms of instruction that exist among departments or even among individual courses." (Zheng, 1992, pg 151)

He later recommends an alternative approach that would result in a workload determination useful both to the department and to the individual:

> "It is necessary to broaden the workload measurements ... so that faculty activities will be evaluated more sufficiently and equitably. This will provide not only better information on faculty utilization for administrators but also positive incentives for faculty to develop activities in all fields of instruction, research, and service and greater acceptance of the use of the workload formula as part of the larger political bargaining process within the institutions." (Zheng, 1992, pg 170)

Margaret Miller describes the urgency of the search for more adequate and acceptable measures of academic staff workload.

> "Attempts to quantify faculty productivity internal to the academy have always been crude, incomplete, or indirect: research funding levels, numbers of publications, or citation rates are simplistic, even as measures of scholarship. State-level reports on numbers of courses taught or hours spent in the classroom per week are more imperfect still as measures of the faculty's effect on students. If members of the higher education community do not develop credible and sophisticated alternatives, however, the public and its representatives will apply their common-sense definitions and categories to the academy, and the fit is often a bad one. There is also an overwhelming internal reason to describe better, and if necessary adjust, how faculty spend their time: if institutions do not find ways to extend the reach of their faculty, the hemorrhage of resources will leave them increasingly anemic." (in Wergin, 1994, pg 12)

3. RESEARCH METHODOLOGY

3.1 Rationale for the research methodology adopted

The nature of the research required the use of a particular methodology. It is likely that the absence of any method of determining academic staff workload that is generally acceptable to academic staff, is at least partly attributable to the fact that the methodology is quite difficult to conceptualize. It appears that at least five distinct stages are required and that each stage utilizes a different approach.

Task determination

The first stage is the determination of the components of an academic workload. In the research reported here, this preliminary stage requires that academic workload is specified not simply in terms of the three broad categories of activity, namely, teaching, research and community service, but also the actual tasks that these categories encompass. This specification cannot simply be done from the literature, although that obviously forms a substantial basis; it needs to be informed by the experience of academic staff working within and across the institution. In order to arrive at a measure of consensus and to ensure that the specification is sufficiently comprehensive, an iterative process is required.

Time allocation

The second stage necessitates arriving at consensus on the relative time allocations for each of the specified activities. While striving for consensus where possible, it might be necessary to retain aspects of difference where they relate to specific disciplines and/or faculties. This process calls for a different methodology where engagement, debate and justification were necessary elements in arriving at consensus.

Algorithm determination

The third stage encompasses the incorporation of the agreed time allocations and weightings for the various dimensions into a mathematical algorithm that captures the influence of the various dimensions on each other, and their overall contribution to lecturer workload. Since

this algorithm would form the basis for stages four and five, it was necessary to set up a simplified trial version, using a commercial spreadsheet programme. This programme, once it had been tested and verified, would be used as the basis for the validation stage and the development of the web-based user interface.

Validation

The fourth stage is the most difficult to accomplish. If the system for determining academic workload was to have any value whatsoever, it would need to be validated within the context of its intended use. This validation must not prejudice the later implementation of the full system, but at the same time it had to provide sufficient and compelling evidence for both parties (academic staff and institutional administrators) to believe that the results obtained on the system are a valid and a reliable reflection of individual staff workloads.

Interface development

The fifth stage, which could to a certain extent run in parallel to the third and fourth stages, would be the development and testing of an acceptable user interface for the execution of the programme. This would be a specialized aspect, requiring the input of computer programmers and web-design experts to convert the basic algorithm into a user-friendly, transparent and adaptable format.

From this overview it is apparent that a number of different research methodologies needed to be applied at different times to aspects of the project while retaining a coherence of participants and a consistency of input. How this would be achieved is outlined in the following section.

3.2 Detailed methodology for each of the four stages

The first stage required the identification of a representative team of staff members who would be qualified and willing to participate in the first three stages of the project. While the team needed to be representative of all faculties and schools of the Technikon, it also needed to reflect a gender balance as well as reflect staff members at the three different academic

levels (lecturer, senior lecturer, associate director). The team needed to have members who were involved in all the aspects of teaching, research, administration and community service.

The final consideration was that the members of the panel had to have a good working relationship with each other and with the project leader. This necessitated that the members were selected rather than sampled at random.

Eighteen staff members were approached by the project leader via a letter (see Appendix A) in which all the members being approached were named, the project itself was described, and the time commitment required in terms of the project was outlined. It was particularly interesting that only one staff member declined to participate, citing reasons of work pressure. One staff member felt that he was not the most suitable person, and nominated another staff member, who subsequently accepted and participated fully in the project. All the other members responded positively, which probably indicates that the project was one that aroused their interest.

During the course of the research, another staff member withdrew, also citing pressure from work and further studies. At the end of the second stage a further staff member left the services of the Technikon, which meant that of the original eighteen approached, fifteen completed their commitment and one participated up to the end of stage two. The project panel represented the Faculties of Engineering, Management, Business Informatics, Applied Sciences, Built Environment and Design, and the Schools of Teacher Education and Hotel and Catering Studies. One major area within the Faculty of the Built Environment and Design was not represented. No staff member from the previous School of Design was approached, because the nature of their teaching differed so markedly from that of the rest of the Technikon that it was felt that they would not be accommodated by a generic workload determination project. (It is possible that the final algorithm could be adapted to meet the specific needs of that discipline, and that adaptation could form the basis for a further research project.) For a full list of research team members, see Appendix F.

Of the research team of sixteen (for phases one and two), four were female (the staff member who withdrew during phase one was also female), four held doctorates (of whom two were at

the rank of Professor), four were at the level of lecturer, six were senior lecturers, and six were associate directors (one of whom was acting Dean and one was acting Director at the time). The research team was therefore fairly representative of the Technikon academic staff complement, although, as indicated earlier, the project leader did exercise some selectivity in terms of the individuals approached, in order to identify those who would commit themselves fully to the process and who were likely to be able to work well together.

Table 1 : Research team by gender

Technikon		Research Team	
Male	226 (71%)	Male	12 (75%)
Female	94 (29%)	Female	4 (25%)

Table 2 : Research team by post level

Technikon		Research Team	
Deans + Directors	9 (3%)	Dean/Director	1+1 (13%)
Associate Directors	56 (18%)	Associate Director	4 (25%)
Senior Lecturers	89 (28%)	Senior Lecturer	6 (38%)
Lecturers	166 (51%)	Lecturer	4 (25%)

Note: The sampling tends to under-represent the lower post levels and over-represent the higher post levels. This was partly due to the fact that a minimum of one Acting-Dean and one Acting-Director had to be included in the sample, and partly due to the fact that the higher post levels were more likely to reflect a greater range of activities than were the lower post levels.

Table 3 : Research team by faculty/school

Technikon		Research Team	
Management	48 (19%)	Management	3 (19%)
Business Informatics	48 (19%)	Business Informatics	2 (13%)
Engineering	87 (34%)	Engineering	6 (37%)
Applied Sciences	49 (19%)	Applied Sciences	3 (19%)
Teacher Education	12 (5%)	Teacher Education	1 (6%)
Hotel School	10 (4%)	Hotel School	1 (6%)

Note: The Faculty of the Built Environment and Design has been omitted. For explanation, see text.

This team was provided with a discussion document (Appendix B) in which a preliminary list of activities was provided and the members were asked to add to this list. The preliminary list was drawn up by the project leader on the basis of his own experience as a senior lecturer and associate director at the Technikon over a period of seventeen years, as well as information obtained from the literature (for details of the literature consulted, see section 4 "Determining Agreed Workload Dimensions").

The initial list was extended using an iterative process, and no suggestions were excluded at this stage. The intention was to generate as exhaustive a list of activities as possible to ensure that the subsequent algorithm would be deemed valid by all participants. At this stage simple addition to the list was decided upon, rather than more sophisticated methods of ranking and exclusion on the basis of some agreed ranking level. It was felt that the greater validity ensured by the inclusion of all tasks identified by the participants was more important than the establishment of a shorter, agreed list of tasks. It was felt that if at a later stage the list needed to be reduced, it could easily be accomplished. This preliminary list was considerably extended during a number of circulations and the final agreed dimensions are given in Appendix C. (In fact, a number of minor additions were made right up to the stage when the interface was finalized).

The second stage utilized the same team members. They were invited to attend a working lunch at which the fourteen who were able to attend were divided into two groups. The purpose of this meeting was to discuss and agree on the time allocations and the weightings that would be allocated to specific dimensions. All team members had been sent the final list of agreed dimensions, together with preliminary time allocations and weightings (Appendix D). [The manner in which the preliminary time allocations and weightings was established is described in the following section.] Each group then worked through all the time allocations and weightings, one group starting with the first section (teaching) and working towards the end; the other group starting with the last section (personal professional development) and working towards the beginning. The decisions of each group were recorded by the two facilitators (the project leader and a colleague from the Teaching and Learning Centre who was involved in the development of the web-based interface) and subsequently compared.

One group was comprised of mainly engineers, natural scientists and mathematicians, while the other group was comprised of staff from the Faculties of Management and Business Informatics. This division was done intentionally to establish whether there were material differences in the time allocations and/or weightings between the sciences and the humanities. Apart from the weightings for subject level (question 3), there were no material differences in the time allocations or weightings between the two group. The subject level weighting difference was retained for the development of the algorithm.

The third stage of the project required the development of a mathematical algorithm based on the conceptual influence of dimensions on each other and on the overall workload determination. This was established in discussion with other members of the team as well as with a colleague in the Teaching and Learning Centre who was simultaneously developing the web-based user interface. Much of the preliminary conceptual work had been done in the process of establishing the various dimensions and the determination of time allocations and weightings. Using a simple spreadsheet programme (Microsoft Excel), an algorithm was built up which incorporated the contribution to overall lecturer workload of all the agreed dimensions (Appendix D).

The fourth stage of the research, establishing the validity of the algorithm, was perhaps the most difficult aspect of the project. Although there was a high degree of consensus regarding allocations and weightings, this did not guarantee that the results produced by the application of the algorithm had any genuine validity.

To establish the validity of the algorithm required that it be tested on a group of academic staff whose notional workload was known and could be compared to the results obtained on the basis of input into the algorithm. Since it had become clear at the onset of the project that no valid or reliable method existed within the Technikon for establishing this information, this aspect of the research appeared to be the most problematic.

It was decided, therefore to determine a benchmark workload against which the algorithm results could be compared. While the use of a random stratified sample of all academic staff might have been indicated, this would not have allowed for the necessary comparison, since

the benchmark for the individuals in this sample would have been unknown. Any variation between individuals, which might be attributed to the algorithm correctly capturing the disparate workloads of those individuals, could not be verified, and therefore there would be no evidence to support the validity of the algorithm.

Benchmarking, in this context, would most closely approximate what Weeks (2000, p60) terms "performance" benchmarking, which she describes as

> "a process of measurement using an external standard of quality to measure internal and external tasks."

Although the measures here are internal to the organisation, they are nevertheless external to the process of time allocation and task weighting, and as such, approximate closely to the understanding of using another standard by which to determine the validity of your own measurement standard. Another term that could be used is "regulatory" benchmarking which is aimed at assuring quality and standards. However, for the sake of simplicity, the unqualified term benchmarking will be used to signify the comparison between the outcomes obtained from the workload algorithm and an independent standard of workload using independent criteria.

Instead of randomizing the sample, it was therefore decided to obtain a sample that was as representative and uniform as possible in terms of workload. If the algorithm was valid and reliable, then the results obtained by its application to a representative but uniform sample should be similarly uniform. In addition, such a method would allow the sample to be deliberately drawn from all faculties and schools represented. Consistent variations from the benchmarked norm could then be interpreted in terms of differences in workload between faculties or schools, rather than in terms of differences between individuals. (Due to the methodology used to identify the benchmarking sample as described below, it was not possible to ensure a truly proportional population sample.)

The uniform sample for the benchmarking process was determined by the members of the original project team, in order to ensure that the researcher did not allow his own bias or preconceptions to influence this selection. Each project team member was asked to indicate

the names of a number of staff members within his or her faculty or school, who, in the opinion of the project team member, represented a "100% workload". They were specifically asked not to nominate staff members who might be over-committed in terms of workload. An undertaking was given that the confidentiality of these names would be preserved at all times and that when the results of the benchmarking exercise were published, staff members would be identified only by their faculty or school.

The researcher then approached those staff members nominated and asked them whether they would be willing to participate in the exercise. The background to the research project was explained to them and an appointment made for them to complete the preliminary workload assessment questionnaire at the researcher's office at a time convenient to both parties. A total of 16 nominated staff members completed the questionnaire in its pilot format over a period of about four weeks, which necessitated the researcher inputting the data into the spreadsheet on the basis of the respondents' answers to the various questions. This process was undertaken individually and the nominated staff members did not have any contact with one another. An assurance of strict confidentiality was given to each participant.

The fifth stage required the development and refinement of a user-friendly web-based interface. This was initially developed using *Asymetrix Toolbook II Instructor Version 7*, but later the content was migrated to a more versatile platform that allowed for direct delivery in web-based format. It was found that although the coding was more complex, it was possible to produce real-time interactivity much more simply than in the original programme. Since this was an essential feature of the delivery, to a large extent it determined the format to be used. [The features that were incorporated and the manner in which it was developed and tested will be described in more detail in a subsequent section.]

4. DETERMINING AGREED WORKLOAD DIMENSIONS

Yuker, in his seminal report (1984) for the Association for the Study of Higher Education on faculty workload, surveys a variety of different methods by which to determine the workload of academic staff. He points out that all have limitations in terms of the particular methods employed. For example, questionnaires tend to elicit a low response rate, giving a small sample on which to base assumptions; interviews are expensive and time-consuming; diaries require a lot of time and effort which staff are generally unwilling to provide; work sampling is complex and might be seen as intrusive. He is also critical of the use of formulas to calculate workload, largely because they lack consistency from one institution to the other and even from one discipline to another.

Zheng (1992, pg ii) notes that

> "Faculty workload was seen to be inadequately measured by the formula methodology and perceived lack of broad qualitative analysis of faculty workload was specifically noted by middle-level administrators."

This may well be as a result of the inadequate grasp of the nature of academic work on the part of the administrators who often design the systems.

"There's a tremendous public misconception about what faculty members actually do," (Joel T. Rosenthal, head of the American Association of University Professors workload project, quoted in Magner, 1994, pg A18). The report goes on to state that it is a mistake to judge faculty members' workload simply by counting the number of hours they spend teaching in the classroom. The report then mentions other activities, such as preparing to teach, grading papers, advising students, serving on campus committees, doing research and catching up on developments in their subject field (Magner, 1994), which directly affect faculty workload.

Yuker (1984, pgs 9-13) discusses various alternative approaches to the determination of academic staff workload. He suggests that student credit hours, student credit hours per full-time equivalent, contact hours, student/faculty ratio are all inadequate measures of workload. He recommends that formulas which fail to distinguish "differences between faculty members

and among different courses on the same level" (ibid, pg 12) should be examined critically before being considered for use.

When considering the approach adopted for this study, it needs to be borne in mind that the determination of academic staff workload is firmly located within a performance management framework. As such it forms an essential management information system which needs to operate at the individual level consistently throughout the institution. This renders many of the possible methods of data gathering and analysis are inappropriate. Taking into account the valid criticisms of the formula method, it was nevertheless decided that it would ultimately be the most suitable, provided the criteria established earlier were incorporated and safeguarded.

Using a broad definition of workload, and informed by the literature, it was apparent that any determination of lecturer workload needed as its departure point the agreed dimensions of the academic function as determined by the staff themselves. Systems that do not extend beyond the three broad areas of teaching, research and community service, were evidently inadequate to describe the variety of tasks that lecturers in higher education, and in particular at technikons, are required to carry out. It was for this reason that a number of additional broad dimensions were added. The final list, derived in part from the literature and in part from the unique nature of technikons as higher education institutions, covered the following broad areas

- Subject teaching (lecturing)
- course design and administration
- committee and professional involvement
- co-operative education
- research involvement
- consultation and community service
- personal professional development

These broad categories are similar to those proposed by Yuker, with the significant addition of co-operative education, a distinctive feature of technikon education. Yuker lists:

- instruction:	time in class, preparation, evaluation, other student contact time
- research:	writing books, articles, preparing applications
- professional development:	attending professional meetings, editing journals
- advisement and counseling:	student/career advising
- institutional service:	departmental and student record keeping, committees
- public service	unpaid consulting, lectures and speeches related to expertise as a faculty member
- personal activities:	nonwork time spent on campus

(Adapted from Yuker, 1984, pgs 36-37)

It has already been pointed out, that when determining workload, it is common to consider somewhat reductionist measures, such as a combination of the number of students taught, the number of courses and the number of hours per week for each course. Even if the other broad dimensions are included, traditional methods of calculating workload fail to account for the differences in workload that different types of courses and different approaches to teaching will generate. For example, the amount of time required to teach one subject to a group of 120 students, who are tested and examined by means of multiple-choice questions, must differ markedly from the amount of time required to teach three courses to groups of 40 students using projects and assignments instead of tests and a final examination.

In addition, where such reductionist measures have been employed, the results have often been so invalid that the whole notion of calculating a "fair" workload has been rejected out of hand by academic staff. (It is interesting to note that the project leader discovered just such a system operating in one of the larger faculties at the Technikon. Staff were unanimous in their rejection of this system, but were very interested when informed that an alternative system was being developed that would try to capture the substantive variations present in different teaching and learning environments.)

Although the literature provided some examples of where the three-dimensional model of workload (teaching, research, community service) had been extended (see, for example, Crawford *et al*, 1983; O'Shea, 1986; Glazer and Henry, in Wergin, 1994, pg 53), none of

them went far enough in terms of trying to capture all the factors that might significantly influence the workload of a lecturer. The study by Crawford (Crawford *et al*, 1983) did go some way to extending the teaching dimension to include preparation time and laboratory and clinical involvement, but surprisingly did not allocate specific time to assessment of students. The rather strange grounds given were that

> "It was recognized that evaluation [assessment] takes time but it was assumed that everyone would need a comparable amount of time for evaluation." (Crawford *et al*, 1983, pg 286)

Zheng (1992, pg 3) suggests that faculty workload has traditionally been defined by two measures:

> "instructional load and faculty activities. The former narrowly refers to the instruction-related activities a faculty member does. The latter includes all the activities undertaken by a staff member, generally classified into teaching, research, and service."

He goes on to state in his detailed analysis of workload determination (Zheng, 1992, pg 39) that

> "the relationship among these major categories of teaching – direct contact, preparation, and evaluation – has not yet been solved. Although they have been recognized to be related and essential in terms of instruction, there is little knowledge about how much time they consume."

Vermuelen (1996, pg 2) makes the following observation.

> "A prerequisite for applying this principle [that formal instructional contact hours should play a significant role in staff allocation] is that a micro analysis of all the activities, associated with formal instruction, should be done. The setting of time norms for each and every activity in the instructional program are the foundation of determining the personpower needs in a department and/or faculty."

It was one of the purposes of this study to try to address precisely these complex inter-relationships between the various components of the teaching process through a more adequate research methodology and to validate the results using a particular variation of the benchmarking process. In addition, the second component identified by Zheng, namely, faculty activities, was also explored and incorporated into a comprehensive algorithm for the determination of academic staff workload.

It was decided to quantify workload in terms of hours, as recommended by Yuker (1984, pg 15) and implemented by Vermuelen (1996, pg 5). He lists the advantages of measuring workload in terms of actual hours spent on tasks rather than as percentages:

> "They can be more accurately estimated, are directly comparable between individuals, and can be converted easily to percentages. Hours are used as a standard measure in most industries. They can be directly added to one another without weighting." (ibid, pg 15)

In determining the algorithm, the distinction between teaching activities and other activities was included, since the literature seemed to indicate this was a useful indicator. Zheng (1992, pg 48) summarizing the research at universities, suggests that on average, full-time professors spent between 40% and 56% of their total work hours on teaching duties, between 16% and 30% on research, and in the region of 15% on administrative duties and 15% on other activities. Mayes (1998, pg 150) indicates that community college staff spend 68% of their time on formal class presentations, 8% on student meeting and advising, 14% on public service activities and 10% on professional development. His findings are similar to those reported by Glazer and Henry (in Wergin, 1994, pg 53) obtained in a detailed study of academic staff activities at Kent State University. They found that academic staff worked on average 52 hours per week, spent 54 per cent of their time on instruction-related activities, between 25 and 35 per cent on research and creative activities and approximately 14 per cent on service, administration, professional and public service.

For the purposes of this study, it was felt that at the individual level the amount of time spent on teaching activities might be an informative statistic, since this comprises the major activity for the majority of staff members. It was considered important for another reason. It seemed reasonable to assume that if staff were required to spend a much higher percentage of their time directly on instruction-related activities (broadly described as teaching), then it might be unreasonable to expect them to be able to devote much time to the range of other activities, given the particularly demanding (both physical and emotional) nature of the teaching task. At the individual level it was felt that the other percentages were not as significant, as they could easily be derived, if required, from the individual's printed report.

4.1. Establishing workload dimensions

Using the iterative process described in the section on research methodology, it was possible to use the seven major dimensions identified earlier in this section as the framework into which all the factors that members of the research panel identified as influencing lecturer workload could be subsumed. This is similar to the approach advocated by Walcerz. He suggests that, for example, in the

> "category of service, an instructor may create a subcategory for each committee post he or she holds, plus subcategories for advising student organizations, coaching, community work, service to professional societies, etc." (Walcerz, 2000, pg 2)

The final list of factors is given here to indicate the scope and nature of these factors. Since the list is made up of factors, and not simply activities, the list is considerably longer than would have been the case were the list to have comprised only activities. The manner in which the interaction between these factors is captured will be outlined in the section on Determining Weightings as well as the section on Establishing the Algorithm. Although many of the factors were identified in advance from the literature as indicated, it is important to stress that the research team both validated and extended the original list of factors to include those that were peculiar to the type of institution (for example, the factors under the co-operative education dimension).

SUBJECT TEACHING (these dimensions would apply for each subject taught)

- **the nature of the discipline** : it is accepted that the amount of time required for lecture or classroom preparation differs considerably from discipline to discipline (Yuker, 1984 pg 35) and that this preparation time needs to be accounted for independently from, but related to, the amount of time spent in face-to-face instruction.
- **level at which the subject is taught** : while it is generally accepted that preparation time increases with course level (Yuker, 1984, pg 39), this is not necessarily a linear association. There are also suggestions that teaching first year subjects may in fact require more preparation time than teaching other levels, due to the necessity of ensuring that explanations are clear and illustrations are appropriate and relevant.

- **number of students** : the number of students has not been shown to influence the amount of preparation and presentation time significantly (Yuker, 1984, pg 37). However, it must necessarily affect the amount of time spent on assessment activities and on consultation.
- **number of formal contact periods per week** : refers to scheduled, face-to-face instructional activities in class groups, excluding laboratory or practical periods, tutorial activities and individual consultation.
- **the period length**
- **whether the person has lectured the subject before in the last year/semester** : it was felt that if the person had to prepare course material and activities for the first time, the subject would require a higher allocation of preparation time.
- **whether the subject itself has been presented before** : this would require the person to plan the course and develop materials without being able to call on pre-existing materials, and would therefore require additional preparation time.
- **whether the person has to design the content and activities for the subject** (in some cases more than one person presents the same subject) : This refers specifically to the design and production of the study guide provided for students, which incorporates the programme for the year or semester, learning outcomes, background reading, assignment details, assessment regulations and procedures, resource material available from the Library Services and other details relating to the course. In instances where this was designed by one person, although the course might be presented by more than one person, the time required for its design could be claimed by only one of team members.
- **whether core notes have to be written or extensively updated** : in many subjects, for a variety of reasons ranging from cost of textbooks to the dynamic nature of the subject field, staff members write fairly ful' sets of notes which are often bound and supplied to students, and take the place of set text books.
- **setting an examination in the subject** : refers to the setting of questions, the control of the typing of the papers, ensuring that the papers proceed through the moderation process and are provided in the correct format to the central Examinations Office.
- **the number of examination papers set**

- **the format of the examination** (mainly short answers, mainly long answers, a mixture of short and long answers) : the nature of the answers required of students affects the time taken to mark each examination script.
- **how many tests there are in the subject** : this determines the amount of time required to set each test, as well as the amount of time required to mark these throughout the course of the year.
- **how long is each test**
- **the format of the tests** : as for examinations
- **the number of major individual projects or assignments** : refers specifically to individual (as opposed to group) out-of-class assignments that are taken in and marked by the staff member concerned outside of the regular class periods.
- **the number of regular homework or in-class assignments that have to be marked** : activities shorter in time and simpler in nature than major projects or assignments undertaken by students either in class or outside class time that are taken in and marked by the staff member outside of the regular class periods.
- **the number of major group projects or assignments** : some assignments may be undertaken on a group basis where the number of assignments that are required to be marked is reduced by the size of each group.
- **the size of the group for these group projects or assignments**
- **the number of laboratory periods personally supervised** : practical periods directly supervised by the staff member. The designation "laboratory periods" is generally taken to mean practical activities involving equipment or apparatus, and as such is typically used in the sciences and related disciplines.
- **the length of each laboratory period**
- **whether the person had technical assistance with the setting up and taking down of laboratory equipment** : in cases where no technical assistance is available, time has to be allowed for the staff member personally to set up and dismantle the equipment or apparatus necessary for that laboratory period.
- **the number of practical periods personally supervised** : the term "practical period" is often used in the humanities, where students have opportunities to implement theoretical strategies in a practical setting, usually in smaller, supervised groups.

- **the length of each practical period**
- **direct involvement with a tutorial programme** : tutorial programmes generally involve students in smaller groups engaging with material or problems dealt with in lectures. They are generally under the direct supervision of staff members, who may or may not be present at the tutorial, depending on whether they make use of student tutors or not.
- **time allocated to formal student consultation** : all out-of-class contact with students in relation to their academic work, whether it is formalized on the timetable, by appointment or on a more casual "drop-in" basis is covered by this aspect.
- **time allocated to special teaching projects for this subject** : in many instances staff introduce large-scale changes in teaching methods or content, experiment with computer-based instruction, problem-based learning, or alternative teaching and learning methodologies. All of these activities demand additional time for preparation and evaluation.

COURSE DESIGN AND ADMINISTRATION

- **curriculum development or redesign** : the formal process of developing a new degree curriculum or fundamentally redesigning an existing curriculum. Often, in the case of technikons, this will be done by the convenor technikon for a particular programme.
- **subject co-ordination** : involves the co-ordination of a subject where more than one person is responsible for the teaching as well as the overall administrative aspects associated with that specific subject, often at a number of different levels.
- **departmental head responsibilities** : covers a wide range of specific and non-specific academic administrative responsibilities which fall to the head of an academic department or academic programme (where more than one programme resorts under one department).
- **exam paper moderation** : all examination papers are required to be moderated internally by another member of staff, and some subjects require additional moderation by an external subject expert.

- **exam script moderation**: ten percent of all examination scripts as well as all borderline cases between classifications must be internally moderated by another staff member.
- **test or assignment moderation** : where test or assignment marks are used as a component of the students' final mark, ten percent of these must also be moderated.
- **student selection** : before students are admitted to a course of study, selection procedures involving academic staff are often implemented in addition to the selection criteria employed by the various faculty offices. This may involve scrutinizing students' applications, reading specific assignments set or interviewing prospective students.
- **student registration** : academic staff are often involved in advising students on course selection and timetable options at the start of the academic year.
- **student orientation** : many faculties and schools offer orientation programmes to new students before the commencement of the formal academic programme. They are aimed at helping students adapt to their new environment and ensuring that there is a smooth transition to higher education.
- **other departmental administrative tasks** : staff are often asked to take on additional administrative tasks, such as the control of administrative and support staff, the setting up and control of budgets, taking responsibility for equipment orders and purchases, and maintenance and control of laboratories and computer facilities.
- **other specific departmental responsibilities** : these are often more formal responsibilities, sometimes relating to institution-wide initiatives such as First Year Programme coordinator, peer helper coordinator or link lecturer for a tutor programme within the faculty or school.

COMMITTEE AND PROFESSIONAL INVOLVEMENT

- **serving on formal Technikon committees as chair or representative** : all institutional services to the committee structures, including preparation for and attendance at committee meetings.

- **secretarial duties related to Technikon committees** : covers the additional time required to set agendas, take and distribute minutes and act as the liaison person between committees.
- **involvement with professional bodies** : this aspect is particularly important in terms of keeping abreast of developments within the discipline, and involves attending formal meetings as well as more informal contact between members of the profession. It complements time spent in preparation, although often little recognition is given for this activity (Yuker, 1984, pg 60).
- **conference or course marketing activities** : the organizing of conferences, although limited generally to a few staff members in any one year, is a very time-consuming activity. The marketing of courses, particularly during the developmental and early years, can also consume an inordinate amount of time.

CO-OPERATIVE EDUCATION

- **student placements** : some staff members are directly involved in finding workstations for students during their co-operative education period. This involves liaison with prospective employers, advertising for and selecting students, and preparing these students for their placement. In some faculties and schools this task is undertaken by the Co-operative Education Department exclusively.
- **co-operative students visits or monitoring** : academic staff members are often required to visit students at their workplace to monitor their progress and to offer advice and support to students. This involves travelling to and from the workstation as well as interviews with the student and his or her employer.
- **evaluation of student workplace projects or "logbooks"** : co-operative education generally requires that students provide evidence of the successful completion of a range of activities or tasks, either by way of project reports or log-books detailing their day-to-day activities and involvement.

RESEARCH INVOLVEMENT

- **formal registration for a further degree** : staff are encouraged to improve their qualifications by way of formal study, generally at post-graduate level. Although

this is an expectation, and sometimes even a contractual obligation, little or no credit is generally given to this activity.

- **the level of that degree** : the higher the degree, generally the more time that is required for completion.
- **how far that degree has progressed** (in terms of years of registration) : it is expected that progress will be made on an annual basis and that the time required during the stages of formulation and completion might vary from that required during the actual execution of the research itself.
- **involvement as chief supervisor or co-supervisor** : the amount of time required for supervision varies as a function of the discipline, the student and the supervisor (Yuker, 1984, pg 32). Acknowledgement should also be given to the amount of time required at pre-registration level where considerable time is devoted to the formulation of the research proposal and the piloting of this proposal through the relevant faculty and institutional structures.
- **the level of involvement** (B.Tech, M. Tech. D. Tech) : given the different nature of the research requirements at different levels, the amount of time required for supervision is likely to vary.
- **the number of students being supervised**
- **involvement with other research projects** : this would cover funded research, institutional research, the development of grant proposals and the evaluation of research.
- **presenting papers at national and international conferences**
- **writing articles for subsidized and non-subsidized journals** : while a distinction between subsidized and non-subsidized articles is useful for the purposes of determining income generated, the amount of time required is probably the same.
- **authoring of books in the person's academic field** : the determination of time on the basis of sole or joint authorship would be on a proportional basis and should be allocated to the period in which the book was being authored rather than the period in which it was published. Although almost all authors would receive remuneration for their role, the fact that this task has a direct benefit for the course and the institution should be recognized.

- **editorial involvement** : many staff are actively involved in editorial work for journals and publications related to their discipline, for which they receive little or no remuneration.
- **artifact production** : artifacts refer to physical objects which are the product of research and development activities and which may or may not enjoy protection from patents or copyright.

CONSULTATION AND COMMUNITY SERVICE

- **time spent on consultation or professional practice** : since most institutions encourage staff to undertake limited consultation or allow them to practice their profession up to some limit, it is advisable that these activities be acknowledged provided that they fall within the institution's formal policy guidelines. If they are left outside the determination of academic workload algorithm it is unlikely that they can be regulated or that their benefit can be determined.
- **direct community service activities** : activities such as career guidance to schools, discipline-related community talks and service to discipline-related public bodies would fall into this category. Excluded, however, would be community service unrelated to the discipline.
- **technikon-related sporting or cultural activities** : in exceptional circumstances where academic staff contribute significantly to these activities by way of unpaid coaching or organizing, this could be construed as part of their overall workload.
- **presenting national or regional workshops** : where academic staff, by virtue of their recognized expertise in their subject field, are requested to assist the academic or public community by sharing this knowledge or expertise.
- **liaison with industry with a view to obtaining financial support, donations "in kind" or research projects** : in certain disciplines, particularly where equipment is very expensive and/or specialized, the institution may benefit greatly from financial support or donations from commerce and industry. Obtaining such donations or financial support may require lengthy negotiations and considerable effort in control and evaluation reports to the sponsor(s).

PERSONAL PROFESSIONAL DEVELOPMENT

- **formal teaching development activities** : if the institution values teaching quality, it may expect its staff to engage in a range of developmental activities during a probationary period or as part of an on-going professional development programme.
- **formal staff development activities** : covers activities aimed at areas other than professional development, such as the development of additional language competencies, management or research skills development, familiarization with labour legislation or retraining for new assignments within the organization.
- **industrial placement with a view to updating professional knowledge or skills**: increasingly it is being recognized that academic staff are removed from the latest advances in commerce and industry, and arrangements are sometimes made for staff to spend extended periods of time (tvpically weeks, but sometimes even longer periods) working in a specific industrial or commercial enterprise with a view to updating their skills and knowledge.

As can be seen, the above list of approximately 65 variables (note that not all are actual tasks, as some are factors that affect the task, such as the level of the subject being taught) is considerably more comprehensive than the lists used in other similar workload determinations. Zheng (1992, pg 51), in his analysis of alternative methods of workload determination, cites models which included 11 variables and 21 constants, and "the most complicated model" which included 16 categories containing 22 variables and 34 constants. Yuker (1984, pg 21) discusses studies which generally employ between five to ten categories, and cites one study which contained 25 duties that could be expected of an academic staff member as being exceptional. The list proposed above appears to be considerably more comprehensive than any of these models, particularly when the various interrelationships, where one variable may affect a number of others, are included. [The interrelationship between the variables will be discussed in detail in the section on Establishing the Algorithm.]

Of particular note is the fact that decidedly more emphasis has been given to the various aspects that comprise subject teaching. Since this activity occupies anywhere between 50% and 70% of the average academic's time, it is surprising that it has received such scant

attention. Perhaps the emphasis on research output when determining academic workload reflects the undue regard with which this is held in most academic circles as well as the fact that this dimension is clearly much easier to quantify than some of the dimensions relating to teaching.

If it is accepted that an academic staff member could be asked to perform any of the above tasks, and allowing for the inclusion of specific tasks not covered by the above list, then it appears to be an acceptable departure point from which to calculate lecturer workload.

4.2. Determining weightings

The next stage in the process was to try and reach consensus about the time allocation or weighting associated with each of the above tasks. As indicated, this did not prove as difficult a task as might have been anticipated. Initially the team members were provided with preliminary time allocations or weightings and asked to accept or modify these on the basis of consensus within the group.

As a departure point, preliminary time allocations or weightings were determined by the project leader on the basis of his own experience and discussion with others, as well as the input that the literature provided. For each of the variables the initial and final allocations or weightings are given below. (References indicate authors who suggest the inclusion of the particular task or dimension and who may, in some instances, propose a time allocation or weighting. Where no references are given, the tasks have not been identified in the literature and therefore the preliminary allocations or weightings are those determined by the project leader. Final agreed allocations or weightings are given, with preliminary time allocations or weightings shown in parenthesis, where they differ from the final figures. Explanatory notes are given in italics. Note also that where no time allocation or weighting is given, this may be because the item response is linked to a specific task or where the respondent is required to fill in the amount of time devoted to that task. Time allocations are per week or per year, as appropriate to the task.)

SUBJECT TEACHING

- the nature of the discipline *(This distinction is picked up in the allocation for the level at which the subject is taught.)*

- level at which the subject is taught **[For Science subjects: 1st yr = 1.7 hrs, 2nd yr = 1.5 hrs, 3rd yr = 1.5 hrs, 4th yr = 1.7 hrs, 5th yr = 1.8 hrs ; For Humanities subjects: : 1st yr = 2 hrs, 2nd yr = 2.1 hrs, 3rd yr = 2.8 hrs, 4th yr = 3.1 hrs, 5th yr = 3.6 hrs]** *(This refers to the number of hours allocated for preparation per 1 hour of formal contact time.)* (Although most authors include this dimension, for example, Yuker, 1984, pg 31; Calitz, 1996, pg 2, there is wide variation in the time allocation. As an extreme example, Crawford *et al*, 1983, pg 285, suggests: "Two hours of preparation time are allowed for each hour of lecture";)

- number of students (Crawford *et al*, 1983: used for determining assessment load)
- number of formal contact periods per week (Crawford *et al*, 1983)
- the period length
- whether the person has lectured the subject before in the last year/semester **[If "no" then time allocation for teaching and preparation are multiplied by 1.5]** (Crawford *et al*, 1983; O'Shea, 1986)

- whether the subject itself has been presented before **[If "no" then time allocation for teaching and preparation is given an additional weighting of 0.5]** (Crawford *et al*, 1983; Yuker, 1984; O'Shea, 1986)

- whether the person has to design the content and activities for the subject (in some cases more than one person presents the same subject) **[40 hours]** (O'Shea, 1986)

- whether core notes have to be written or extensively updated **[100 hours]** (Walcerz, 2000)

- setting an examination in the subject **[20 hrs for setting; 0,25 hrs for marking each student]** (Walcerz, 2000)

- the number of examination papers set
- the format of the examination (mainly short answers **[marking time multiplied by 0.5]**, mainly long answers **[marking time multiplied by 2]**. a mixture of short and long answers**[marking time multiplied by 1]**)

- how many tests there are in the subject **[3 hrs per test for setting]**
- how long is each test **[marking time 0.08 hrs per test hour]**
- the format of the tests (mainly short answers **[marking time multiplied by 0.5]**, mainly long answers **[marking time multiplied by 2]**, a mixture of short and long answers**[marking time multiplied by 1]**)

- the number of major individual projects or assignments **[marking time = 0.75 hrs per assignment]** (Walcerz, 2000)

- the number of regular homework or in-class assignments that have to be marked **[marking time = 0.15 hrs per assignment]**

- the number of major group projects or assignments **[marking time = 1 hr per assignment multiplied by the number of students divided by the size of the group]**

- the size of the group for these group projects or assignments
- the number of laboratory periods personally supervised
- the length of each laboratory period
- whether the person had technical assistance with the setting up and taking down of laboratory equipment **[if "no" then actual time multiplied by 2]** (Calitz, 1996, pg 2)

- the number of practical periods personally supervised (practical periods are used in the humanities, whereas laboratory periods are generally used in the sciences) (Crawford *et al*, 1983)

- the length of each practical period (Crawford *et al*, 1983)
- direct involvement with a tutorial programme
- time allocated to formal student consultation (Winkler, 1992)
- time allocated to special teaching projects for this subject (Walcerz, 2000)

COURSE DESIGN AND ADMINISTRATION (Crawford *et al*, 1983)

- curriculum development or redesign (Walcerz, 2000)
- subject co-ordination **[1 hour per subject per week]** (O'Shea, 1986)
- departmental head responsibilities **[4 hours per week]** (Crawford *et al*, 1983)
- exam paper moderation **[4 hrs per exam paper]**
- exam script moderation **[6 hrs per batch of 20 scripts]**
- test or assignment moderation **[3 hrs per batch of 20 scripts]**
- student selection
- student registration **[8 hrs per registration cycle]**
- student orientation **[4 hrs per registration cycle]**
- other departmental administrative tasks

- other specific departmental responsibilities (such as First Year Programme coordinator, peer helper coordinator)

COMMITTEE AND PROFESSIONAL INVOLVEMENT (Crawford *et al*, 1983)

- serving on formal Technikon committees as chair **[6 hrs multiplied by 4 meetings per year],** representative **[2 hrs multiplied by 4 meetings per year]** or secundus **[2 hrs multiplied by 1 meeting per year]** (Crawford *et al*, 1983; Walcerz, 2000)

- secretarial duties related to Technikon committees **[6 hrs multiplied by 4 meetings per year]**

- involvement with professional bodies (Crawford *et al*, 1983; Walcerz, 2000)
- conference or course marketing activities

CO-OPERATIVE EDUCATION

- student placements **[8 hrs per student]**
- co-operative students visits or monitoring **[2 hrs per student per visit]**
- evaluation of student workplace projects or "logbooks"

RESEARCH INVOLVEMENT (Crawford *et al*, 1983)

- formal registration for a further degree **[diploma or undergraduate degree = 1 hr per week per subject, but no allocation for first two subjects** (regarded as individual's contribution to personal development)**; honours or B.Tech part-time = 1 hour per week per subject, but no allocation for first two subjects; M. degree by course work = 3 hrs per week; M. degree by thesis: yr 1 = 100 hrs per year, yr 2 = 150 hrs, yr 3 = 75 hrs, yr 4 = 50 hrs; D. degree: yr 1 = 200 hrs, yr 2 = 300 hrs, yr 3 and subsequent = 150 hrs]** (Calitz, 1996, pg 2)

- the level of that degree
- how far that degree has progressed (in terms of years of registration)
- involvement as chief supervisor or co-supervisor **[B.Tech = 40 or 20 hrs per student; M.Tech pre-registration = 50 or 25 hrs; M.Tech with full thesis = 100 or 40 hrs; M.Tech with half thesis = 75 or 30 hrs; D.Tech pre-registration = 50 or 20 hrs; D.Tech = 200 or 80 hrs]**

- the level of involvement (B.Tech, M. Tech. D. Tech)
- the number of students being supervised (Walcerz, 2000)
- involvement with other research projects

- presenting papers at national and international conferences **[80 hrs per paper]** (Walcerz, 2000)
- writing articles for subsidized and non-subsidized journals **[50 hrs per article]**
- authoring of books in the person's academic field **[200 hrs or proportion thereof]** (Walcerz, 2000)
- editorial involvement
- artifact production (artifacts refer to physical objects which are the product of research and development activities) (Walcerz, 2000)

CONSULTATION AND COMMUNITY SERVICE (Crawford *et al*, 1983)

- time spent on consultation or professional practice
- direct community service activities (such as career guidance to schools, community talks related to subject field) (Crawford *et al*, 1983; Walcerz, 2000)
- technikon-related sporting or cultural activitie :
- presenting national or regional workshops (Crawford *et al*, 1983)
- liaison with industry with a view to obtaining financial support, donations "in kind" or research projects

PERSONAL PROFESSIONAL DEVELOPMENT (Crawford *et al*, 1983)

- formal teaching development activities
- formal staff development activities
- industrial placement with a view to updating professional knowledge or skills (Winkler, 1992)

5. WORKLOAD ALGORITHM

5.1 Establishing the algorithm

The workload determination was premised upon a comparison of the individual's workload over a predetermined period of time with the notional workload that could be expected of any full-time member of the academic staff. It was accepted, however, that the algorithm would not attempt to capture the amount of time spent to a degree of accuracy that would carry any statistical significance, particularly since the default values could be changed by each participant. Rather, it attempted to include all possible activities in a manner that gave equivalence in terms of notional time required for the successful execution of the activity. This caveat must be borne in mind when the results of the benchmarking process are discussed.

As a departure point against which to measure staff workload, it was proposed (and agreed by the research team) that a figure of 50 hours per week be used. This was based on reported studies, particularly in the United States, which suggested that academic staff ("faculty") work "on average, from 47 to 57 hours a week" (Magner, 1994, pg A18), and that this differs according to the nature of the institution:

> "Academics at research institutes work 57 hours a week, those at doctoral institutions work 54-hour weeks, and those at comprehensive and liberal arts colleges work 52 hours a week. Academics at two-year institutions work 47 hours a week." (Hodges, 1994, pg 10)

> "Community College staff in the United States work approximately 47 hours per week and spend about 75% of their time in direct teacing activities." (Mayes, 1998, pg 147)

> "Hundreds of studies over many years yield convergent data indicating that faculty members report that they devote an average of 55 hours per week during the academic year to professional activities." (Yuker, 1984, pg v)

The picture therefore does not appear to have changed much over time. Jordan and Layzell (1992, pg 5) report an average for all private and public institutions involved in a 1987 survey of 53 hours, with 57 hours being worked at public research institutions and 52 hours at public

comprehensive institutions. For the purposes of the initial development and validation, it was decided to use a conservative figure, positioning the Technikon somewhere between a two-year institution and a doctoral institution, on the understanding that the figure of 50 hours per week could always be adapted in the light of experience.

[It is interesting to compare the American norms with those elsewhere in the world. For example, in France, there was considerable protest at a government move to increase the workload requirements for university professors to a minimum of four hours teaching per week for 32 weeks plus the supervision of 192 hours of independent study or 300 hours of practical work by students (Dickson, 1983). In the United Kingdom, the Association of University Teachers diary exercise indicated that academic staff are working a 55 hour week (Santinelli, 1994).]

In the validation process, it was interesting that nobody questioned this figure, although it was pointed out to them that this was a considerably longer working week than would be expected in commerce or industry. Most staff members felt that the nature of their job required that they work long hours, and many felt that at certain times of the year their working week would be considerably longer than the suggested 50 hours. Most, however, felt that if the workload were averaged out over the academic year, the proposed figure was certainly not excessive.

One of the primary parameters that the algorithm sought to determine was the actual amount of time the individual spent on the range of prescribed tasks versus the notional time available (calculated on a 50 hour week multiplied by the number of working weeks in the academic year). This was expressed both as a comparative figure (in terms of the number of hours) and as a percentage (the number of actual hours divided by the number of notional hours available).

A second parameter was the determination of what percentage of the staff member's time was actually devoted directly to teaching activities (including tasks such as test and examination marking, and student consultation). It was felt that this would be a useful indicator, since the literature seemed to indicate that even at research universities staff spent at least 43 percent of

their time on teaching, about 29 percent on research and the balance on other administrative and related activities (Magner, 1994, pg A18). A greater proportion of overall time devoted to teaching, 62 percent, was reported by Jordan and Layzell (1992, pg 6) at public comprehensive institutions. In an interesting study in nursing education, Crawford (Crawford *et al*, 1983, pg 286) suggests that the teaching load should be 60 percent of the total load, and Mayes (1998, pg 148) indicates that community college staff spend approximately 75% of their time in direct teaching activities.

Given that the Technikon is primarily a teaching institution, it was felt that the proportional figure for teaching would probably be considerably higher than for a research university, and possibly even higher than for a nursing education institution. However, if a very high percentage of time was devoted to teaching, there was a feeling that it might negatively affect the individual's capacity to contribute significantly to other areas of performance, such as research or co-operative education. In such an event, it might not be reasonable to expect that a staff member, whose proportion of time spent on teaching activities was excessively high, would be able to attain the notional 100 percent workload allocation.

The algorithm used the 50 hour week allocation multiplied by the number of weeks in the academic year as the norm or standard of comparison. This second figure was taken to be 43 weeks (after the deduction of vacation time and statutory holidays), and an academic semester was considered to be 21.5 weeks. The academic year and the total workload was determined as 50 hours multiplied by 43 weeks to give a notional 2150 hours per year. The total time available for teaching was taken to be 34 weeks after the deduction of days for registration, examinations and study time in preparation for examinations. Teaching time for semester subjects was taken as 16 weeks (not half of 34 weeks) since one additional week would be lost either to registration (in the second semester) or to examinations (ir. the first semester).

The algorithm was derived by summing the contribution of each of the activities. The contribution made by each activity was determined on the basis of the consensus time allocations or weightings and the inter-relationships between these, as shown in Table 4. (The layout reflects the layout of the Excel-based spreadsheet programme, rather than the final web-based version, since the formulas used can be more easily represented in this format.

However, it must be borne in mind that exactly the same formulas have been used in the final version.)

The algorithm is presented in Table 4 in terms of the sequence of numbered questions that are asked of academic staff. Each question is briefly described in terms of the specific aspect that is being covered, together with an indication of how the information provided is captured (see Note in Table 4 for details). The formulas for the calculation of the contribution of each aspect are indicated in the shaded cells.

Table 4 : Details of the workload algorithm

Note: 1. The letters WF refers to the weighting factor(s) applied to that aspect; N refers to the number applied to that aspect; A refers to the time allocation applied to that aspect.
2. The algorithm is the sum of the results of the shaded block formulas only.

Aspect			Formula	Notes
1	Discipline			
2	Subject level	WF		Discipline determines applicable value for each level
3	Number of students	N		
4	Duration of course	N		34 or 16 weeks, or block length
5	Length of period	N	Length in Minutes/60	
6	Experience	WF		Factor only applies if lecturer has no experience in this subject
7	New subject	WF		Factor only applies if subject has not been offered before
8	Teaching and Preparation time		WF2*4N*5N *(6WF+7WF)	
9	Course design	A	A9	40 hours
10	Note production	A	A10	100 hours
11	Exam setting	A	A11	20 hours is the time allocated to set an exam.
12	Number of exam papers	N		
13	Exam nature	WF		
14	Subject level	WF		The weighting factors applied to exam marking is different to the weighting factors applied for aspect 2
15	Exam marking		N3*N12*WF13 *WF14*0.25	0.25 is the time in hours allocated to mark each 3 hr exam script with mixed format answers.
16	Number of tests	N		
17	Test setting	A	N16*3	3 hours is the time allocated to set a test.

18	Test length	N		Length in hours
19	Test nature	WF		Same weighting factors as for exam papers (aspect 13)
20	Test marking		N3*N16*N18 *WF19*WF14*0.08	0.08 is the time in hours allocated to mark each hour test.
21	Number of individual projects	N		
	Marking of individual projects		N3*N21*WF14 *0.75	0.75 is the time in hours allocated to mark each major project
22	Number of individual activities marked	N		
	Marking of individual activities		N3*N22*WF14 *0.15	0.15 is the time in hours allocated to mark each regular activity
23	Number of group projects marked	N		
24	Group size	N		
	Marking of group projects		N3/N24*N23*WF14 *1	1 is the time in hours allocated to mark each group project
25	Laboratory periods	N		Per week
26	Lab period length	N		In hours
27	Lab technician support	WF		
	Laboratory tuition		N25*N26*WF27 *N4	In hours
28	Practical periods	N		Per week
29	Practical length	N		
	Practical tuition		N28*N29*N4	In hours
30	Tutorial programme	N	N30*N4	Hours per week
31	Student consultation	N	N31*N4	Hours per week
32	Teaching projects	N	N32*N4	Hours per week
1-32 would be repeated for each subject and added together to provide the total number of hours related directly to teaching.				
33	Curriculum development	N	N33*N4	Hours per week
34	Subject coordination	N	N34*1*43	1 hour per subject for 43 weeks
35	Departmental head	A	A35*4*43	4 hours per week for 43 weeks
36	Question paper moderation	N	N36*4	4 hours per paper
37	Exam script moderation	N	N37*6	6 hours per batch of 20 moderated exam scripts
38	Test and assignment moderation	N	N38*3	3 hours per batch of 20 moderated tests or assignments
39	Student selection	N	N39	Hours per year (ie total hours)
40	Student registration	A	A40	8 hours allocated for registration
41	Student orientation	A	A41	4 hours allocated for orientation
42	Additional administration	N	N42*43	Hours per week for 43 weeks

43	Specific responsibilities	N	N43*43	Hours per week for 43 weeks
44	No of committees chaired	N	N44*6*4	6 hours per meeting; 4 per year
45	No of committees as full representative	N	N45*2*4	2 hours per meeting; 4 per year
46	No of committees as secundus	N	N46*2*1	2 hours per meeting; 1 per year
47	No of committees as secretary	N	N47*6*4	6 hours per meeting; 4 per year
48	Professional body involvement	N	N48*43	Hours per week for 43 weeks
49	Conference organising	N	N49	Hours per year (ie total hours)
50	No of co-operative student placements	N	N50*8	8 hour per placement
51	No of co-operative students visited	N		
52	How many times each student is visited	N		2 hours per visit
	Time spent on visiting co-operative students		N51*N52*2	
53	No of student log-books evaluated	N		
54	Time per log-book evaluation	N		In hours
	Time spent on log-Book evaluation		N53*N54	
55	Part-time undergraduate studies	A	A55	Allocation varies according to level and number of subjects
56	Part-time postgraduate studies	A	A56	Allocation varies according to level and year of registration
57	No of postgraduate students supervised	N		
58	Level of postgraduate supervision	A	N57*A58	Allocation varies according to level
59	No of postgraduate students co-supervised	N		
60	Level of postgraduate co-supervision	A	N59*A60	Allocation varies according to level
61	No of research projects	N	N61*43	Hours per week for 43 weeks
62	No of national conference papers	N	N62*80	80 hours allocated per paper
63	No of international conference papers	N	N63*80	80 hours allocated per paper
64	No of informal publications	N	N64*5	5 hours allocated per publication

65	No of non-subsidized journal articles	N	N65*50	50 hours allocated per article
66	No of subsidized journal articles	N	N66*50	50 hours allocated per article
67	No of academic books authored	N	N67*200	200 hours allocated per book
68	No of academic books part authored	N	N68*200*%	Percentage of 200 hours based on the co-author's contribution
69	Editorial activity	N	N69*43	Hours per week for 43 weeks
70	Artifact production	N	N69*43	Hours per week for 43 weeks
71	Consultation	N	N71*43	Hours per week for 43 weeks
72	Community service	N	N72*43	Hours per week for 43 weeks
73	Sport and cultural involvement	N	N73*N4	Hours per week
74	Discipline-related workshops	N	N73	Hours per year (ie total hours)
75	Obtaining industry sponsorship	N	N74	Hours per year (ie total hours)
76	Placement in industry for knowledge updating	N	N75	Hours per year (ie total hours)
77	Formal teaching development activities	N	N76*N4	Hours per week
78	Formal staff development activities	N	N77*N4	Hours per week

5.2 Validating the algorithm through a benchmarking process

It is appropriate to question some aspects of this methodology, before presenting the results obtained from the completion of the questionnaire. Firstly, it is impossible to determine whether those nominated indeed met the criteria of "100%" workload. At best we can say that in the opinion of a selected panel who were involved in the development of the parameters, the time allocations and the weightings, these staff members were **perceived** to meet the necessary criterion. In the Faculty of Management two panel members nominated a total of four colleagues, three of whom were common to both nomination lists. While this cannot be said to prove that the benchmarking was valid, it does indicate a fairly high level of congruence in terms of the perceptions of staff members as to colleagues who would conform to the criterion.

Another interesting aspect of this process was the fact that all staff members approached indicated their willingness to participate. There was considerable interest in the project itself and many participants expressed the need for such a workload determination. Although each participant was told that the process of completing the preliminary workload assessment questionnaire would take only approximately twenty minutes, most spent at least an hour in conversation and discussion. A number requested the opportunity to complete the questionnaire a second time using a different semester or year programme. (The full set of results are provided in Table 5, with the notes indicating which results were part of the benchmarking exercise.)

A parallel process to that of benchmarking was the completion of the preliminary workload assessment questionnaire by a number of other staff members who had at some time or another expressed interest in the project. These results were gathered to see whether the algorithm would produce significant variation between individuals whose workloads were not expected to be similar. This information complemented that obtained by the benchmarking exercise and is presented in Table 6.

5.3 Results of the benchmarking process

The result obtained from the fifteen nominated staff members is given in Table 5. Since the input into the algorithm contains a degree of subjectivity (by virtue of the nature of many of the questions which call for approximations and estimates), it would be inappropriate to attach much statistical significance to measures of central tendency and dispersion obtained on the basis of these results. However, what is immediately evident is the high degree of uniformity in the results obtained, which seems to reflect a degree of homogeneity in the original population sample. In addition the absolute values obtained are all clustered close to the target value of 100%. Some of the instances of significant deviation can be accounted for by the high proportion of teaching which comprises the overall load (an aspect that will be discussed in more detail below).

Table 5 : Summary of 100% benchmarking exercise

Faculty/School	Workload (hrs)	% vs target	% teaching	Notes
Management	2051	95.4	95.2	
Management	2106	98.0	85.0	"normal" load
	(2330)	(108.4)	(86.4)	As above, with extra student numbers
Management	1789	83.2	88.0	
Management	2090	97.2	74.7	
Management	1757	81.7	87.8	Students away for 8 weeks of the year
	(1965)	(91.4)	(89.1)	As above, for full year
Engineering	2102	97.8	67.0	"normal" load
	(2760)	(128.4)	(79.2)	As above, with 1 extra subject
	(2031)	(94.5)	(71.8)	As above, minus 1 subject
Engineering	1847	85.9	88.0	Very heavy teaching load
Engineering	2064	96.0	66.6	Department Head
Engineering	2091	97.3	86.4	
	(1549)	(72.1)	(81.6)	As above, minus 1 subject taught at night
Applied Science	1993	92.7	57.0	Semester; "light" load
	2664	124.0	64.1	Semester: 1 extra subject
	(2101)	(97.8)	(54.5)	As above, minus 1 subject
Applied Science	2387	111.0	81.4	4 lab-based subjects; small numbers
Hotel School	2082	96.9	67.1	
Teacher Ed.	2224	103.5	84.3	Large number of computer subjects
Business Inform.	1855	86.3	89.9	4 subjects
Business Inform.	1933	89.9	94.8	1 subject, large numbers, 3 terms only
	(2123)	(98.8)	(95.1)	As above, for 4 terms

Note: Cells that have been shaded are taken to reflect the benchmark result. For further explanation see "notes" column.

It is interesting to note that when changes to the workload of individuals included in the benchmarking exercise is made (as shown in parenthesis in Table 5), there is generally a noticeable shift in that individual's workload. While this may be expected, it does suggest that the algorithm is sensitive to changes in actual activities, and that the uniform results are not simply the product of an algorithm that produces a uniform result regardless of the variations in input. If one considers the second Management result (2106 hours), an increase in student numbers produces an approximately 10 percent increase in workload (from 98.0 % to 108.4%). Similarly, an increase in the number of subjects taught (Engineering, 2102 hours) increases the workload by over 30 percent (97.8% to 128.4%). Differences between semester loads is also well reflected in Applied Science (1993 hours) where a light semester load (92.7%) is balanced by a subsequent heavy semester load (124%).

Another significant factor is the effect of small student numbers in subjects that rely heavily on laboratory work. Where staff members are required to supervise and to mark the

laboratory reports (Applied Sciences, 2387 hours), a heavy workload may result despite the relatively small numbers in the class groups (in this case, fewer than 20 students in each class).

What is apparent from the picture presented by Table 5 and from the more detailed analysis discussed above, is that although the results obtained from the benchmarking group are fairly uniform, reflecting the conceptual homogeneity of the group, there are subtle differences in terms of how the overall workload determination is arrived at which reflect the reality of the differing situations of those involved.

During the period of some four weeks that the benchmarking process occupied, a number of other staff members became aware of the project and expressed interest in completing the analysis. This resulted in an additional seven staff members completing the analysis, and their results are reflected separately in Table 6. This group is not in any way representative, except that the majority of those who expressed interest probably did so because they saw in the analysis the possibility of convincing others that they were working harder than they were being given credit for. This reason was certainly expressed by a number of these participants, although some simply completed the analysis out of interest and because they enjoyed a good working relationship with the author.

These results, reflecting an essentially heterogeneous group, are reported in Table 6. What is striking about these results is that they, unlike the results in Table 5, do not reflect any uniformity at all. In contrast, there is a high degree of diversity in overall workload, with a range from 58.7 percent to 198.9 percent. What Table 6 demonstrates quite clearly is that the algorithm does not simply produce the uniform results presented in Table 5 because it is insensitive to differences in individual workload. Considerable differences are readily evident when the workload of a random group of staff members is determined.

Table 6 : Other assessments undertaken

Identifier	Workload (hrs)	% vs target	% teaching	Comments
A	2490	115.8	72.9	1 extra subject, small number of students
	(2123)	(98.7)	(63.6)	Different semester programme
B	1263	58.7	85.2	Person agreed they had more capacity in line with figures arrived at
C	2594	120.6	88.4	
D	3034	141.1	85.0	HOD with no reduction in 3 subject teaching load
	(2178)	(101.3)	(79.1)	As above, minus 1 subject
E	2774	129.0	69.0	Network administrator (344 hrs), subject coordinator for six subjects (260 hrs)
F	4276	198.9	69.5	2 intensive subjects, 1 other plus heavy admin load (+17 hrs per week)
	(2266)	(105.4)	(68.6)	As above, 2 intensive subjects combined, minus 1 subject and minus admin load
G	2095	97.5	72.9	

If the algorithm is to have demonstrated validity and reliability, two of the six foundational principles established in section 1, then the results obtained in Tables 5 and 6 are essential in convincing staff and academic managers of its usefulness.

Table 5, however, contains another important element of significance in terms of the application of workload determination in a performance management system. If the results of the benchmarking group are examined, it becomes apparent that there is an inverse relationship between overall percentage workload and percentage teaching: staff who have the highest percentage teaching load generally have the lowest overall percentage load. This suggests that if a high percentage of the overall workload is comprised of activities directly related to teaching, then it is unlikely that staff will be able to engage in activities in the other six dimensions. The result will be that their overall workload will fall below the 100 overall workload percentage, despite the fact that all these staff members were notionally "100 percent" in the views of their colleagues. This confirms the observation of Coudret, quoted in O'Shea (1986, pg 20):

"faculty members with a weekly teaching load in excess of 20 hours have found it almost impossible to conduct research or to enhance or even maintain their own practice skills."

A high teaching load, then, would appear to preclude active involvement in the other major areas of academic activity.

This phenomenon becomes more apparent if the data is ordered on the basis of percentage teaching, as done in Table 7.

Table 7 : Benchmarking exercise results sorted in descending order on the basis of percentage teaching

Faculty/School	Workload (hrs)	% vs target	% teaching	Notes
Management	2051	95.4	95.2	
Business Inform.	1933	89.9	94.8	1 subject, large numbers, 3 terms only
Business Inform.	1855	86.3	89.9	4 subjects
	(1965)	(91.4)	89.1	As above, for full year
Management	1789	83.2	88.0	
Engineering	1847	85.9	88.0	Very heavy teaching load
Management	1757	81.7	87.8	Students away for 8 weeks of the year
	(2330)	(108.4)	86.4	As above, with extra student numbers
Engineering	2091	97.3	86.4	
Management	2106	98.0	85.0	"normal" load
Teacher Ed.	2224	103.5	84.3	Large number of computer subjects
	(1549)	(72.1)	81.6	As above, minus 1 subject taught at night
Applied Science	2387	111.0	81.4	
	(2760)	(128.4)	79.2	As above, with 1 extra subject
Management	2090	97.2	74.7	
	(2031)	(94.5)	71.8	As above, minus 1 subject
Hotel School	2082	96.9	67.1	
Engineering	2102	97.8	67.0	"normal" load
Engineering	2064	96.0	66.6	Department Head
	2664	124.0	64.1	Semester: 1 extra subject
Applied Science	1993	92.7	57.0	Semester; "light" load
	(2101)	(97.8)	54.5	As above, minus 1 subject

Note: Cells that have been shaded are taken to reflect the benchmark result. For further explanation see "notes" column.

If the averages of percentage teaching and percentage workload versus target are calculated for the top six and the bottom six in this ranked list, the difference is very apparent. There is an almost 10 percent difference in total workload and 22 percent difference in the teaching load (see Table 8). The average for teaching load is also considerably in excess of average time spent on teaching reported at universities and community colleges. These figures vary

considerably between studies, but the highest reported figure for community colleges is 77% (Faculty Workload Report, 1996, pg 7).

Table 8 : Averages of the top and bottom six benchmarking analyses

RANKED ON % TEACHING	% Vs TARGET	% TEACHING
Top 6 benchmarked staff	87.1	90.6
Bottom 6 benchmarked staff	98.2	67.0

Note: Only data in highlighted cells has been used.

This conclusion, based on the empirical results obtained and supported by the literature, has important implications when it comes to the interpretation of any data obtained from the workload determination. These implications will be highlighted in the section on recommendations.

6 DEVELOPING THE USER INTERFACES

6.1 The input interface

Two of the principles for the implementation of the workload determination algorithm were particularly important when it came to the design of the input interface. These were **transparency** and **adaptability**.

The principle of **transparency** implied that both the allocations and the weighting factors must at all times be visible to the participants and that the results of their operation on the algorithm must also be immediately evident. This was relatively easy to achieve in the developmental Excel-based version, since Excel allows for all formulas to be visible and for changes to be made directly on these formulas. Calculations also take place in real time and the results can be displayed on the same page of the spreadsheet.

However, it was decided early on in the project to migrate ultimately to a web-based format, for ease of delivery and because this format allowed for rapid completion of the programme by participants, since navigation could take place via a hypertext format. Rapid completion was considered an important feature. Walcerz, in his description of an electronic faculty portfolio, stresses this point:

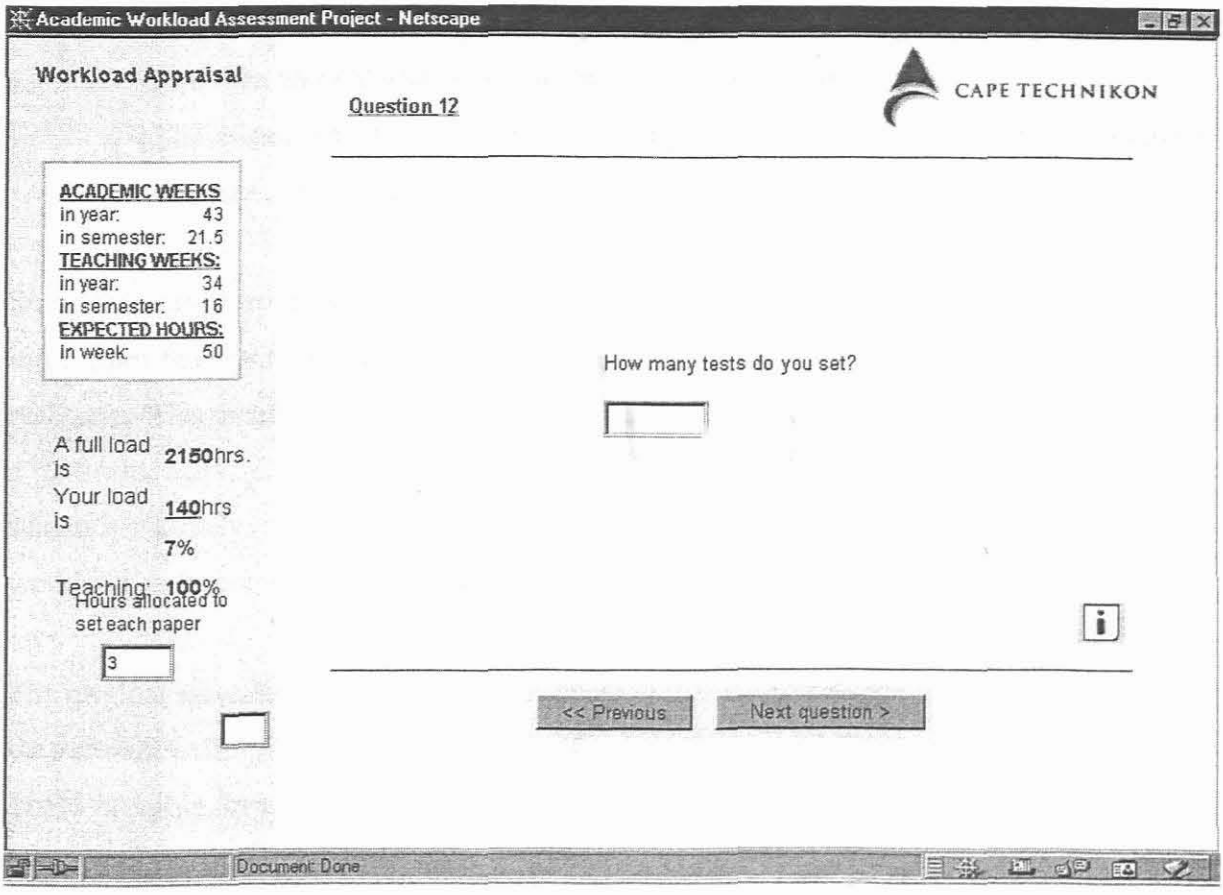
> "The faculty portfolio will be successful only if the benefits outweigh the costs. The main cost to faculty is the time they must spend learning the software and submitting material to the portfolio, so the user interface was expressly designed for ease of use and speed." (Walcerz, 2000, pg 3)

The choice of a web-based interface meant that participants would be relatively familiar with the layout and navigation tools, and the ability of the interface to allow them to skip forwards and backwards rapidly, leaving out sections that were not relevant to their context, meant that the speed with which the programme could be completed was considerably enhanced.

However, making the transfer from the Excel-based input interface to a web-based interface posed particular design challenges because of the nature of the delivery format. Whereas a spreadsheet allows all the formulas and calculations to be viewed simultaneously, a web-

based interface presents only one screen at one time. Forcing the participant to scroll up or down to find information is highly undesirable, so an innovative solution was implemented. The screen was divided into two "frames" (see Figure 1).

Figure 1: Example of the web-based page layout



The left-hand frame contained information that was required throughout the completion of the algorithm and the right-hand frame contained only the sequential input questions for the completion of the workload determination. This meant that the left-hand frame needed to contain the following information:

- Information about the length of the academic year or semester;
- Information about the length of the teaching year or semester;
- A statement about the number of notional working hours in each week;
- The target workload figure representing 100 percent (43 weeks multiplied by 50 hours per week = 2150);

- The cumulative workload based on "to-date" input;
- The percentage workload based on the "to-date" input divided by the target workload figure. (This would be a dynamic figure, changing each time new data was entered regarding any one of the activities);
- The percentage teaching load based on the "to-date" input under teaching divided by the total "to-date" input. (This would be a dynamic figure, changing each time new data was entered regarding any one of the activities);
- The allocation of time or the weighting factor applied to the particular question displayed in the right-hand frame.

Since the computations of the overall workload and the percentage teaching load required input from the right-hand frame, it was necessary to make them dynamically interactive in real time. This meant that if changes were made to the time allocation or weighting factor for a particular activity, the results would be immediately visible in terms of the three summary statistics (namely, cumulative workload, cumulative workload as percentage of target workload, and percentage teaching).

The original spreadsheet was given to the programmer who extracted the formula for each of the relevant cells. They were converted into Javascript and hidden in the left-hand frame. These invisible formulae control the output that is visible to the user. The right-hand frame consists of the question and an input area ("form") which accepts the input from the user and transmits it to the controlling formulae in the right-hand frame. The summary statistics are instantly updated and made visible to the user.

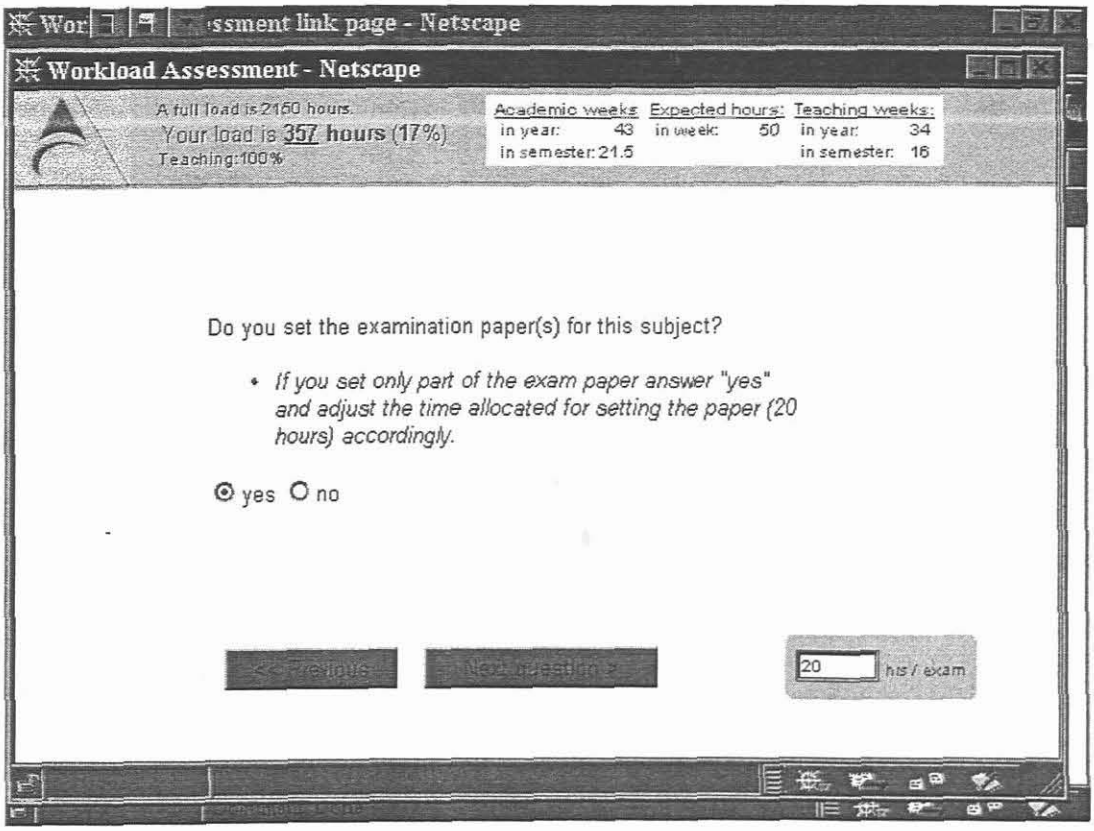
Initially the questions were imported directly from the documentation that had been used for the development of the agreed tasks and weightings, and modified in terms of how they had been ordered and grouped on the original spreadsheet programme. However, once it had been established that the algorithm in the new format exactly replicated the algorithm as set up on the spreadsheet, it was possible to edit the original questions to make them clearer and more explanatory. This was informed by the process of benchmarking and the sorts of questions that participants had raised during the completion of the programme. It was evident that a stand-alone programme would need to be considerably more comprehensive in terms of

describing the tasks and would also need additional explanatory text to assist the participant in correctly responding to the specific question. This necessitated the reformulation of many of the ninety-five questions and the addition of considerable explanatory text. It was a time-consuming process since it could not be done directly, but had to be effected via downloaded files for each individual question.

Once completed, the final questions, together with the accompanying explanatory texts, were exported to the web-site where they replaced the relevant files. The final stage involved checking the algorithm against analyses undertaken using the original spreadsheet programme, as well as making changes to layout and the inclusion of explanatory introductory pages.

A final change in format was decided upon, and the left-hand frame was replaced by a horizontal frame at the top of the page containing the same information as the original left-hand frame, and interacting in exactly the same manner. It was decided to move the information to the top of the screen to make it slightly less intrusive and changes to the variable figures less obvious and distracting. This also provided more space in the remaining frame to accommodate the extended explanatory texts without necessitating scrolling. An example of the final web-based page layout is shown in Figure 2.

Figure 2: Example of the final web-based page layout



6.2 The output format

It was decided that the hardcopy output should contain all the original input data in a format that made for easy reading and which linked the input directly to the questions that had been asked. Part of this hardcopy output is given below in Figure 3.

Figure 3 : An example of the hardcopy workload determination output

WORKLOAD ASSESSMENT REPORT

Date: 24 / 07 / 2000 Staff number: 1203

The period under review is one year (43 weeks).
Your total is **2259 hours**, which is **105%** of a full load of 2150 hours
and the percentage of your work-load that is teaching is 60%.

Teaching

Below are your allocations for each subject:

presented by you before
level one (1111)

Level 1 in sciences discipline
Number of students: 65
This course runs for a year
Periods in a week: 6
Period length: 45
Subject lectured by you before
Subject presented by you before
Design of content and activities
Updating of core notes
Setting of examination papers
Marking each student
Number of 3-hour exam papers: 1
Long answer exam format
Number of tests: 4
Marking each test
Length of tests:2
Mixture of short & long answer test format
Number of major assignments done individually: 1
Number of major assignments done in groups: 2
The size of each group is 5 people
Involvement in tutorial programme: 2 hours / week
Formal student consultation: 1.5 hours / week

Subject sub-total: **700 hours**
51% of teaching
31% of your workload

While attention was given to the hardcopy output format, it was recognized that if implementation was to take place as part of an effective performance management system within a higher education institution, then much of the dialogue around the information would occur in an interactive, on-screen situation. Since the objective of the system was not to fix in time the workload of staff members, but rather to provide an executive information system which would allow for the more effective management of individuals and departments, it was felt that the dynamic nature of the on-screen report would be of considerably greater value than the static paper-based version.

It was felt, too, that the hardcopy report might be more useful as a retrospective analysis of what had been accomplished in terms of agreed objectives and outputs, whereas the dynamic on-screen format might be most useful at the planning and directing stage when the individual's workload was being considered in prospect.

The on-screen report operates at two distinct levels of information. The first level, displayed throughout the process by the information available in the top frame, provides an overall picture of the individual's workload: the actual number of hours accumulated, the percentage they represent versus the notional one hundred percent and the percentage thereof that is taken up by direct teaching-related activities.

The second level provides direct access to the information related to each question and how it affects the overall workload determination. This allows the detailed information to be interrogated and manipulated to see the effect that changes would have on the individual's overall workload determination. This level would allow for the dynamic interaction that was proposed earlier, in which the academic manager and the staff member could use the information to plan and direct individual performance.

7 IMPLEMENTATION STRATEGIES

7.1 Conclusions

It might be argued, in the light of the views expressed by a number of writers referred to in Section One, that the implementation of a web-based management information system relating to the workload of teachers in higher education is totally inappropriate. The argument put forward is that the nature of the higher education enterprise is little understood and is not amenable to simple quantification. In addition, the motives behind any such attempts, generally financial and almost always punitive, are anathema to the collegial knowledge-creating environment of higher education. These are persuasive arguments at both a philosophical and an operational level, and the decision makers in higher education should deliberately expose themselves to such arguments as a counter to the technicist, utilitarian views of higher education often propounded by politicians and government officials in departments of education.

However, as was pointed out, in the absence of a change of mind (or heart) on the part of those who decide policy at a national or institutional level, there is every likelihood that some form of performance management is going to be foisted on higher education institutions in the name of accountability, efficiency or responsiveness to national need. What is clear is that if these systems are designed by human resource practitioners, or at worst, imported from the industrial or commercial sector, then they are likely to be based on information that reduces the complexity of the higher education task to a set of pre-determined, easily obtainable and finitely measurable outcomes or ratios.

What this research project has set out to achieve is to provide an alternative research methodology for arriving at the information that will form the backbone of a performance management system. Using participative and iterative methodology it has been possible to develop an algorithm that captures, to an acceptable level of accuracy, the complex nature of the academic task and reflects it in a form that allows for the data to be adapted, verified, interrogated and modified. By benchmarking the workload determination for a particular institution, it has been possible to demonstrate that the results obtained from the algorithm do

to a large extent reflect the perceptions of academic staff. They therefore have a high validity. The ability of the algorithm to capture differences in academic workload has also been demonstrated to a limited degree with a small number of volunteer subjects.

It is proposed that should a performance management system be introduced into a higher education institution (for whatever reason), it should at least be supported by a valid and reliable information system regarding the workload of individual academic staff members. The system that has been described in this thesis is the product of a particular methodology and has been "packaged" for a particular delivery format. For other institutions this may be more or less appropriate in its present form. It would be possible either to adapt the present algorithm, using the methodology outlined – expanding the tasks and re-determining allocations and weightings – or to develop a new algorithm using the same methodology.

It is the author's firm conviction, as has been argued throughout this thesis, that to introduce a performance management system into a higher education institution without the necessary information regarding individual staff workload, is to premise the decisions made on a foundation of sand. Performance management requires input from a wide variety of quantitative and qualitative sources, but the range and nature of these sources needs to be informed first by the nature of the academic task and the specific nature of the job of each academic staff member in terms of this task.

It is interesting that Watson, Houdeshel and Rainer (1997, pg 106) give the motivating factors, using an anchored five-point scale, in the development of an Executive Information System (similar to a management information system) as follows:

Table 9 : Motivating factors in the development of an EIS

Motivation	Mean
Provide easier, faster access to information	4.68
Improve the efficiency and effectiveness of senior executives	3.95
Monitor organizational performance	3.90
Improve communication	3.47
Extract and integrate data from incompatible sources	3.31
Change executives' mental model of the organization	2.82
Competitive information	2.71
Monitor external environment	2.28

The factors that the managers in this study rated as most important all related to their ability to manage; only the last one focused on the performance of individual subordinates. For a system of workload determination to be acceptable in higher education, it needs to support the first six factors, and not be introduced with a view to identifying "under-performers" and eliminating them from the system.

7.2 Recommendations

The workload determination project needs to be taken forward and incorporated into a performance management system. Baird, Beatty and Schneier (1982, pg 76-77), suggest a fourteen-stage sequence of actions to develop, implement and maintain an effective performance management system. They will be presented as the framework for the first set of recommendations, since this will help to locate the various actions within a logical and coherent framework, part of which has already been followed in this project.

1. Determine the type of program the organization will support. [Completed]

2. Obtain support of top management.

   This was not done as the second stage of the process, because the author believed that the exercise would have greater credibility and staff support were it to be seen as a research initiative, and not one either driven or supported by the institutional management. This does present a potential problem, in that the management could reject the results of the study, but given that in an educational institution high store is set on quality research, it is hoped that management would be receptive to the results of the study.

   However, this stage still needs to be undertaken by presenting them with the results of this study and convincing them that the soundness of the methodology, and validity and reliability of the results, indicate that this method of workload determination is ideally suited to any new envisaged performance management system.

3. Determine what specific existing needs the programme would fulfil. [Completed]

4. Involve the users in the design. [Completed]

5. Design a performance information system. [Completed]

6. Test the program. [Completed]

7. Develop policy, procedures and guidelines in the form of an appraiser's manual. [Partially completed, but the remainder awaits the design of the performance management system.]

8. Communicate the program.

   There is already a fairly wide awareness of the workload determination project, since staff members in each faculty/school have been involved as members of the research team and as benchmark validators. However, it will be necessary to go to all faculties/schools and explain to them how the system was developed and how it could be implemented. Two major advantages are that the system is easy to use, and can be delivered to each desktop computer via the institution's intranet. This should ensure that everyone is aware of the system in a short period of time.

9. Train supervisors.

   This is considered to be one of the crucial components for effective implementation, and one that is overlooked by up to 50 percent of companies introducing performance management systems. It will be necessary to hold training sessions for all academic managers from the rank of Head of Department upwards to inform them as to the underlying philosophy of the

system and demonstrate to them how the information should be interpreted and can be used.

10. Orient subordinate employees. [Covered under 8]

11. Begin making appraisals.

It is recommended that the workload determination system be implemented initially on a voluntary, trial basis for a period of either one semester or one year. Ideally this would involve departments committing themselves to using the system and reporting back on acceptability, problems and usefulness of the data provided.

If this process goes well, then the institution could decide to incorporate it into the formal performance management system from the following semester or year. It is important that full implementation is not rushed, but rather that genuine concerns are addressed and changes made to the system so that when officially implemented it will enjoy wide acceptance.

12. Use the results in making salary, transfer, promotion and termination decisions.

Given the underlying philosophy, it is strongly recommended that the results of the workload determination **not** be used for the above purposes in the short term. It might be possible to use data for promotion purposes, but it must be remembered that this is a management information system, not a performance management system. The above decisions should be based on a comprehensive performance management system that uses data, both quantitative and qualitative, from a number of different sources, of which workload determination is simply one. **Such decisions must not be made on the basis of workload determination alone.** If they are, the system will be regarded as negative and attitudes will quickly become hostile. In such a situation the system may well break down.

13. Monitor and revise the program.

It is certainly the intention that the workload determination system would be monitored and revised in the light of feedback received during the voluntary, trial phase and during the ongoing implementation phase. Since the system is totally transparent, it is easy to add new dimensions or change allocations or weightings to existing dimensions. The revised programme can then be made available immediately to all participants via the institution's intranet.

14. Orient new supervisors.

All academic staff appointed or promoted to an academic leadership position should receive an orientation to the workload determination system. This orientation should be immediately on employment or promotion, and should focus not only on the mechanics of the system but on the underlying philosophy of performance management and the use of executive information systems.

It is important to bear in mind that the results obtained from an analysis of academic staff workloads should be used **appropriately**. Yuker (1984, pg xiii) suggests that the information should be used to answer the following four questions:

- "Are faculty members dividing their time in a way that is consistent with the general mission of the institution?
- On the whole, does there appear to be inappropriate emphasis in areas that are inconsistent with or dysfunctional to the institution's mission?
- Within specific academic subunits is there an appropriate balance of workload activity, keeping in mind that one academic subunit may vary greatly from another?
- Are workload activities at different academic ranks appropriate and consistent with institutional goals and missions?"

Casey and Beck (1992, pg 1) suggest that a uniform workload determination system could

"- Assure that the best utilization of instructional staff is currently made, or if not, to improve utilization.

- Assure that internal equity in workload exists, or provide a framework in which to improve it."

What is significant is that the workload determination should inform the performance management of the institution at the level of the department or sub-unit, not primarily at the level of the individual staff member. The challenge in the implementation of any such system is to ensure that it is used for its primary purpose, namely, as a performance management tool, and not as a means of "checking up on" or identifying under-performers (however this might be defined). This focus is only likely to be retained if those involved in the implementation of the system are adequately trained and if the **monitoring** of the system by the institutional managers occurs at the aggregate level, and not at the level of the individual. However, properly implemented, it has the potential to be a powerful management information system in the hands of those tasked with the role of academic leadership and management.

It is recommended that when the system is implemented, it be in two stages, both of which would be required for any performance management system. The first stage is **prospective** (Yuker, 1984, pg 17). Staff members would be asked to provide data at the beginning of each semester (or year) based on the classes they will be teaching and the other activities that have been allocated to them for that period. This is essential if pro-active management strategies at departmental level are to be instituted. It would obviously be accepted that this is an estimate of the workload for that period, but that even if this were not entirely accurate, it would allow for departmental planning, and the allocation, and reallocation of duties to take place in a more informed and structured manner than is likely at present.

The second stage would be **retrospective**. This would require staff members to reflect back on the period under review and adjust their prospective analysis in the light of actual events that occurred during that period. This would be a more accurate reflection of their workload situation. It would be useful for review and evaluation purposes and would feed into the planning cycle for the subsequent period as well as assist at the individual level in adjusting the individual's estimate of time required in terms of actual time taken. This process might be

particularly helpful in the light of findings that indicate staff members might have an inclination to overestimate the amount of time required to perform certain tasks (Yuker, 1984, pg 17), as demonstrated in Table 6.

Ideally, but probably unrealistically, one might advocate a process of continuous updating of the individual workload determinations. Although this is certainly possible given the transparency and adaptability of the system, it is likely that this would not be undertaken in most cases where the administrative side of the academic task is the least liked and sometimes the least conscientiously performed of all the various tasks undertaken by academic staff members.

For the workload determination programme to work effectively within a performance management framework, it will be necessary to develop valid and reliable **qualitative** measures of performance for many of the key areas that the workload determination has identified. In some instances this may simply require the refinement of existing instruments or procedures. For example, most institutions have systems of student evaluations of academic staff members in terms of their subject teaching. Depending on their appropriateness, they may well provide qualitative indicators in the areas of teaching identified by the workload determination process; if not, those areas that are presently not represented can be incorporated relatively easily. The same may well be true for areas such as research involvement and co-operative education.

It may, however, be necessary to consider new and innovative ways of gathering qualitative information about individual performance in some of the other workload dimensions, such as course design and administration, committee and professional involvement, consultation and community service, and personal professional development. Some work has undoubtedly been done in some of these areas, but it is likely that new instrumentation and methods will have to be developed in addition to what already exists.

One challenge that exists for the workload determination programme as currently devised is that it does not appear to be appropriate for disciplines whose teaching methodology differs radically from the traditional methods found in higher education. This would include areas

such as pure and applied design, and architecture, where the method of studio teaching based primarily around applied design projects is not easily amenable to simple quantification in terms of the hours required of academic staff. Although these environments were deliberately excluded from the current project, it would undoubtedly be necessary to analyze these separately and produce a modified workload determination algorithm tailored specifically to these disciplines.

Another aspect that needs to be noted in the integration of the workload determination programme into an overall performance management system, is the observation from the literature and the empirical evidence of this study, presented in section 5. It relates to the evidence presented that staff members who had the highest percentage teaching load generally had the lowest overall percentage load. This infers that if a high percentage of an individual's overall workload is comprised of activities directly related to teaching, then it is unlikely that the overall workload will approach the 100 percent mark. This is particularly significant when comparing the workload of staff members within a department or when establishing the expected "norm" for an individual member of staff. Consideration must be taken **first** of the percentage of the individual's workload related directly to teaching activities, and the overall workload expectation adjusted in the light of this percentage.

This appears to be an important recommendation in institutions where the expectation is that academic staff members will carry a heavy direct undergraduate teaching load, often considerably in excess of the international norms described in section 4. If academic managers do not make this adjustment, they may have unrealistic and unattainable expectations of their staff. This, in turn, could lead to the entire workload determination system being called into question and with it the concept of performance management for academic staff in higher education.

Finally, it is recommended that the system be implemented cautiously, slowly and with the necessary adjustments being made on the basis of practical experience. Such a management information system needs to be adapted in the light of changing circumstances. If the system appears to work well in a given context, it does not mean that it can simply be transferred to a different context without a careful process of negotiation, validation and monitoring. It is

important to remember that for such a system to succeed in its stated purpose, the process of implementation is as important as the system itself. An appeal is made to academic managers not to see this system as the solution to all problems experienced in managing the performance of academic staff.

REFERENCES

Angehrn, A. 1992. *Supporting multi-criteria decision making*, in *Executive Information Systems and Decision Support*, Holtham C. (ed) 1992. Chapman & Hall, Cambridge, pg 125-141.

Baird, L., Beatty, R. and Schneier, C. 1982. *The performance appraisal sourcebook.* Human Resource Development Press, Massachusetts.

Cage, M.C. 1991. *States questioning how much time professors spend working with undergraduate students.* The Chronicle of Higher Education, vol 37, August 7 1991, pg A20.

Calitz, C. 1996. *Uitgangspunt vir berekening van doseerbeladings en aktiwiteite.* Universiteit van Stellenbosch Departement Bedryfsielkunde, internal memorandum, pg 1-6

Campus Review (unnamed editor). 1999. *Educators at breaking point as workloads just keep on growing.* Campus Review, October 27-November2, pg 2.

Casey, M. and Beck, B. 1992. *Development of a teacl ing load policy.* Paper presented at the 32nd annual forum of the Association for Institutional Research, Atlanta, Georgia, May 10-13 1992.

Council on Higher Education. June 2000. *Towards a New Higher Education Landscape:Meeting the Equity, Quality and Social Development Imperatives of South Africa in the 21st Century.* Shape and Size of Higher Education Task Team, Council on Higher Education, Pretoria, 30 June 2000.
http://education.pwv.gov.za/DoE_Sites/Higher_Education/CHE/CHE_Report30June2000.htm

Crawford, M.E., Laing, G., Linwood, M., Kyle M. and DeBlock, A. 1983. *A Formula for Calculating Faculty Workload.* Journal of Nursing Education, vol 22, 7, pg 285-287.

Dickson, D. 1983. *French Professors Strongly Oppose Plan to Increase Teaching Loads.* The Chronicle of Higher Education, vol 27, 26 October 1983, pg 27.

Eason, K. 1992. *Organizational issues in the use of decision support systems*, in Executive Information Systems and Decision Support, Holtham C. (ed) 1992. Chapman & Hall, Cambridge, pg 9-16.

Faculty Workload Report, Fall 1996. 1997. University and Community College System of Nevada.

Fisch, L. 1996. *The Chalk Dust Collection.* New Forums Press Inc. Oklahoma.

Gaither, G. (Editor) 1999. *The multicampus system: perspectives on practice and prospects.* Stylus, Virginia.

George, P.S. 1987. *Performance Management in Education.* Educational Leadership, vol 44, pg 32-39.

Hodges, L. 1994. *Professors prove their hard work.* The Times Higher, vol 1108, January 1994, pg 10.

Hughes, C. and Sohler, C. 1992. *Can performance management work in Australian Universities?* Higher Education, vol 24 (41), pg 41-56.

Jordan, S.M. and Layzell, D.T. 1992. *A case study of the faculty workload issues in Arizona: implications for state higher education policy.* The State Higher Education Executive Officers and the Education Commission of the States. Denver.

Kells, H.R. (Editor). 1993. *The development of performance indicators for higher education: a compendium for twelve countries.* Organisation for Economic Co-operation and Development, Paris. (Second edition)

Koch, F.J. 1988. *Die ontwikkeling van 'n praktiese doelwitbestuurstelsel vir die Kaapse Technikon.* University of South Africa, Economics, Master of Commerce. June 1988.

Kredietstelsel vir Akademiese Personeel, undated. University of Stellenbosch School of Management, internal circular, pg 1-3.

Layzell, D.T. 1992, *Tight budgets demand studies of faculty productivity.* The Chronicle of Higher Education, vol 38, 19 February 1992, pg b2-b3.

Magner, D.K. 1994. *Association of University Professors challenges the belief that professors are underworked.* The Chronicle of Higher Education, vol 40, January 26, pg A18.

Mayes, L. 1998. *Assessing faculty workload: a review of the University of Kentucky Community College system process and outcomes.* Community College Journal of Research and Practice, vol 22 (2), pg 145-151.

McGourty, J. 1999. *Four Strategies to Integrate Assessment into the Engineering Education Environment.* Journal of Engineering Education, October 1999, pg 391-395.

Margetson, D. 1997. *Ethics in assessing and developing academic quality.* Assessment and Evaluation in Higher Education, vol 22 (2), pg 123-134.

O'Shea, H.S. 1986. *Faculty workload: myths and realities.* Journal of Nursing Education, 25, 1, pg 20-25.

Ramsden, P. 1999. *Teaching and Learning – an informal discussion.* HERDSA News, August 1999, pg 3-4.

Santinelli, P. 1994. *Diaries reveal a 55-hour week.* The Times Higher, vol 1134, July 29, pg 36.

Schermerhorn, J., Hunt, J. and Osborn, R. 2000. *Organizational Behaviour*. John Wiley & Sons, Inc. New York. (Seventh Edition).

Slatter, P. 1998. Data sheet on PTS work load. Personal communication with the author.

Vermeulen, P. 1996. *An Academic Staff Allocation Model*. University of Pretoria Bureau for Institutional Research, University of Pretoria internal publication.

Walcerz, D.B. 2000. *The EnableOA™ Electronic Faculty Portfolio.* http://www.enableoa.com/noframes/paper4.html

Warner, d. and Crosthwaite, E., 1995, *Human Resource Management in Higher and Further Education*. The Society for Research into Higher Education & Open University Press, Buckingham.

Watson, H., Houdeshel, G., Rainer, R. 1997. *Building Executive Information Systems and other Decision Support Applications.* John Wiley & Sons, U.S.

Weeks, P. 2000. *Benchmarking in Higher Education. an Australian Case Study*. Innovations in Education and Training International, vol 37, 1, pg 59-67.

Wergin, J.F. 1994. *Analyzing Faculty Workload.* Jossey-Bass, San Fransisco.

Winkler, A.M. 1992. *The Faculty Workload Question.* Change, vol 24, pg 36- 41.

Windham, D. 1990. *Memorandum: Faculty workload issues*. Quoted in Zheng, Y. 1992, pg 42.

Yuker, H. 1984. *Faculty workload: research, theory and interpretation.* ASHE-ERIC Higher Education Research Report #10. Washington, D.C. Association for the Study of Higher Education.

Zheng, Y. 1992. *Faculty Requirement Calculations, Workload Concept, and Allocation of New Positions: A Case Study of the University at Albany, State University of New York 1980-1990.* D. Ed Dissertation, School of Education, Department of Educational Administration and Policy Studies, University of Albany, State University of New York. University Microfilms International, Ann Arbor, USA.

APPENDIX A

LETTER TO INVITED PARTICIPANTS

Cape Technikon
Teaching and Learning Centre
Teaching Development
21 January, 2000

TO: Mrs S Riordan, Faculty of Management
Mrs V Potterton, Faculty of Natural Sciences
Mr V Archer, Faculty of Engineering
Prof A Slabbert, Faculty of Management
Mr W Lotter, Acting Dean, Faculty of Business Informatics
Mr C Whaits, Faculty of Engineering
Mr G Leigh, Faculty of Engineering
Dr P Marais, Faculty of Engineering
Mr F Nel, Faculty of Management
Dr C Barrett, Faculty of Management
Dr C Bakkes, Faculty of Natural Sciences
Mr D Botha, Faculty of Management
Mr J Bothma, Faculty of Business Informatics
Mrs X Cupido, School of Hotel and Catering Studies
Mrs K Evans, Faculty of Design and the Built Environment
Mr WAJ Smith, Acting Director School of Teacher Education
Mr WA Nel, Faculty of Engineering
Prof P Slatter, Faculty of Engineering

REQUEST FOR YOUR PARTICIPATION IN A RESEARCH PROJECT

As you are undoubtedly aware, the Technikon is in the process of embarking on a performance management system, which may well be linked to remuneration increases. As a precursor to any such performance management system, it is essential to be able to determine both the key performance tasks for academic members of staff, as well as a means for "measuring" the performance of individual members against some predetermined norm.

It is my belief that if we are not pro-active we will find that a system has been devised for us by people who have little, if any, knowledge of the demands and dynamics of the higher education environment. This will lead to potential conflict and the expenditure of considerable amounts of creative energies to try and rectify the system.

The alternative is for the teaching staff to work together on providing a sound research basis for the development and implementation of a system to determine an equitable work load for teaching staff which encompasses all the key performance tasks identified by those same staff members.

At this stage the research programme will be divided into three distinct phases:

1. The establishment of the key performance tasks, using a selected sample of teaching staff members in different disciplines.
2. The weighting of these tasks on the basis of consensus.
3. Undertaking a number of trials with another selected sample of staff using these agreed weightings.

At this stage I am approaching you to ask whether you would be willing to form part of the selected sample of teaching staff **for phases one and two.**

The commitment that would be required would probably be of the following order:

- An initial briefing session of 30 minutes at which a list of key tasks would be distributed. You would be asked to provide comment and additions within a period of 7 days (this would probably not take you more than 30 minutes).
- A second meeting at which the weighting of each of these tasks would be negotiated on the basis of consensus (this might take between 1 and 2 hours, probably over lunch).
- A final refinement of the weightings at a later stage after a number of trials had been conducted.

I cannot offer you payment for participating in this project. At best I can offer you the satisfaction of being part of a team that is thinking critically about the nature and demands of the job of teaching. I will, of course, acknowledge your contribution in any publication(s) that might flow from this research project, and the possible opportunity for one of you to present the findings at a suitable local or international conference.

If you are willing to participate, please let me know **by 31 January**, as we want to begin this project as soon as possible. A considerable amount of preliminary research has already been undertaken, reviewing the literature, looking at other systems within and outside the Technikon, and planning methodological aspects.

If you are willing to participate, I will send you a copy of the research proposal in order to give you more detailed background (if you are interested) and also to indicate how much preparatory work has already been done.

I look forward to hearing from you.

Phillip Parsons

APPENDIX B

LIST OF PRELIMINARY PARAMETERS

Cape Technikon
Teaching and Learning Centre
Teaching Development

KEY PERFORMANCE TASKS

Below is a list of key performance tasks that could be expected to form the basis for the individual job description of any member of the teaching staff (excluding specialist positions) - lecturer, senior lecturer, principal lecturer, head of department. In addition, there is information required that will modify that task (such as the level of the course, the number of co-operative education visits to each student).

What I would like you to do at this stage is to

- remove any that you think could never form part of such a job description (don't focus specifically on your own position, try to think of what could reasonably expected of your colleagues as well);
- add any that you feel have been left out. This could be a new task altogether, the addition of new elements to an existing task, or the provision of additional information that will modify the nature and extent of a task. **This is the most important part of this exercise - we need to produce the most comprehensive list that we can.** We can always eliminate tasks at a later stage, and we can always expect staff members to ignore those that don't apply; but leaving out tasks that certain members feel they are expected to perform will call into question the validity of the entire exercise at a later stage.
- Some of the questions are framed as if the event is in the future (eg. "Anticipated number of students") because the system would probably be used to set individual work expectations before all these issues have been finalised - they would then be adjusted in the light of the actual situation.

The list has deliberately been printed in double spacing to allow you write in any additional tasks. Please could you let me have it back **within two weeks.**

TEACHING

For each course (subject) that is taught, including the same subject in English and Afrikaans:

1. The discipline (subject area)

2. The subject name and ITS code

3. Level (1st yr, 2nd yr, etc)

4. Anticipated number of students in the course

5. Semester or year course

6. The number of formal contact periods per week for that subject

6a. The period length (in minutes)

7. Whether the person has lectured the subject before

8. Whether the person has to design the content and activities for the course

9. Whether the person has to draw up core notes for the subject

10. Whether there is a final examination in the subject

11. Whether the person has to set (and mark) the final examination

12. How many tests are there

13. How long are these tests (averaged out for the semester/year)

14. The format of the tests (eg short answers, extended calculations, etc)

15. The number of projects and assignments done individually by students (which would include setting and marking. If there is no examination - question 10 - then this would be considered to be a continuous assessment subject).

16. If projects done in groups, how large is the group and how many assignments are done in group format

17. The number of laboratory periods per week that are supervised by the person

18. The length of a laboratory period

19. The number of practical periods per week that are supervised by the person

20. The length of a practical period

21. Involvement with a tutor programme in the subject

22. The number of hours per week that this requires

23. The number of hours per week set aside for formal student consultation

COURSE DESIGN AND ADMINISTRATION

24. If the person is involved in curriculum development or redesign, the number of hours per week that this occupies

25. Whether the person is the co-ordinator of a course, and if so, how many courses

26. Whether the person is a departmental head

27. Whether the person is involved in student selection

28. Whether the person is involved in student registration

29. In addition to the above responsibilities, how many hours per week are spent on academic or departmental administration

COMMITTEE AND PROFESSIONAL INVOLVEMENT
(In each case, details would be required)

30. The number of formal Technikon committees on which the person serves as chairperson

31. full representative

32. secundus

33. The number of professional bodies the person is actively involved with

CO-OPERATIVE EDUCATION

34. The number of co-operative students the person is responsible for placing

35. The number of co-operative students the person visits

36. The number of visits paid to each student during the year

RESEARCH INVOLVMENT

37-42 Whether the person is formally registered for a further qualification, the nature of the qualification and whether part-time or full-time

43-45 Whether the person is involved as a chief supervisor for students at B, M (full or half thesis) or D level, and how many

46-48. Whether the person is involved as co-supervisor for students at B, M (full or half thesis) or D level, and how many

49. Whether the person is involved in other research projects, and how many hours per week this would involve

50-51. Whether the person is intending to present papers at national or international conferences, and how many

52-54. Whether the person intends publishing any articles in informal, non-subsidised or accredited journal, and how many

55. Whether the person intends publishing any books in his/her academic field during the next year

56. The number of hours per week devoted to artifact production

CONSULTATION AND COMMUNITY SERVICE

57. The number of hours per week spent in consultation

58. The number of hours per week spent on direct community service

59. The number of hours per week spent on Technikon-related sporting or cultural activities (seasonal sports would be averaged out over the year

PERSONAL PROFESSIONAL DEVELOPMENT

60. The number of hours per year spent on industrial placement or commercial updating

61. The number of hours per week spent on formal teaching development activities

62. The number of hours per week spent on formal staff development activities

APPENDIX C

FINAL LIST OF PARAMETERS AND DIMENSIONS

REPORT BACK AND TENTATIVE FINDINGS FROM THE FIRST ROUND OF CONSULTATION REGARDING AGREED HOUR AND WEIGHTING/FACTOR ALLOCATIONS FOR ESTABLISHED WORKLOARD DIMENSIONS (hours or factors are in italics).

PLEASE COMMENT CRITICALLY ON THESE FINDINGS

Weeks in the academic year = 43
Weeks in an academic semester = 21.5
Teaching weeks in a year = 34
Teaching weeks in a semester = 16
Teaching weeks in a term = 8
Expected number of working hours per week = 50
Workload = working hours per week x weeks in academic year = 2150hrs

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Please note that the activities referred to below are those that could reasonably be required of you in terms of your basic conditions of service. This might include evening lectures (where these form part of your academic load). However, where you receive **additional remuneration** (for evening lectures or short courses, external moderation) these **are not to be included** in determining your workload.

LECTURING

Factor used:
Default:
Change factor to:

A full load is:
Your running total is:

For more information on this question use this help function

NOTE: All times should be given in terms of hours or fractions of hours (ie. 90 minutes = 1.5 hrs) unless otherwise requested.

1. Discipline

Engineering
Science
Biological Science
Mathematics
Computing
Humanities
Management

2. Subject name and ITS code

NOTE: IF YOU OFFER THIS SUBJECT TO MORE THAN ONE GROUP (IE. ENGLISH CLASS AND AFRIKAANS CLASS OR IN TWO DIFFERENT PROGRAMMES) COMPLETE THIS ANALYSIS FOR EACH GROUP

3. Level *1=1.7 2=1.5 3=1.5 4=1.7 5=1.8 for sciences*
1=2 2=2.1 3=2.8 4=3.1 5=3.6 for humanities

4. Anticipated number of students ☐

5. Does this course run for
a term
a semester
a year
if it is a block release course, how many weeks constitutes one block (you would need to treat each block as a separate subject)

6. How many formal contact periods do you have per week (excluding practicals, laboratories and tutorials)?

6a. How long is each period IN MINUTES?

7. Have you lectured this subject before in the last year/semester?
Yes = 1 No = 1.5

7a. Has this subject been presented before?
Yes = 1 No = 0.5 added to factor of 1.5 in (7) = 2

8. Are you required to design the content and activities for this course? (Only answer "no" if this subject is presented by a number of people and someone else is responsible for designing the content and activities.)
Yes: Allocation = 40 hours

9. Do you have to write or extensively update/modify core notes for this subject?
Yes: Allocation = 100 hours

10. Is there a final examination in this subject?

11. Do you set the examination for this subject? (If you teach this subject to more than one group, answer YES only once for setting the examination.)
Allocation = 20 hours for setting, typing, translating, etc.
0.25 hours for marking each student

11b. If there is more than one 3-hour exam paper, please indicate the number of papers.

11c. What format does this exam take?

- mainly short answers (including multiple choice) *Factor = 0.5*
- mainly long answers (case studies, extended calculations, etc.) *Factor = 2*
- a mixture of short and long answers *Factor = 1*

11d. At what level are you examining? [NOTE: the level will already have been determined from Question 3; the factor for marking will simply be applied at this stage]

level 1 *Factor = 1*
level 2 *Factor = 1.2*
level 3 + *Factor = 1.5*

12. How many tests are there?

13. How long are these tests? (If the length varies, calculate an approximate average)

1 hour
2 hours
3 hours
longer than 3 hours - please specify length

14. What format do these tests take?

- mainly short answers (Including multiple choice) *Factor = 0.5*
- mainly long answers (case studies, extended calculations, etc.) *Factor = 2*
- a mixture of short and long answers *Factor = 1*

14b. At what level are you testing? [NOTE: the level will already have been determined from Question 3; the factor for marking will simply be applied at this stage]

level 1 *Factor = 1*
level 2 *Factor = 1.2*
level 3 + *Factor = 1.5*

15. How many major projects or assignments are there that are done by students individually (ie not in groups)? *Allocation = 0.75 hours per project or assignment*

15a. How many regular assignments (eg homework or in-class assignments that are regularly taken in and marked) are there that are done by students individually (ie not in groups)? *Allocation = 0.15 hours per assignment*

16. How many major projects or assignments are done in groups?
Allocation = 1 hour per group project

16a. Indicate the size of the groups (ie. 4)

17. How many laboratory periods **per week** are there that you personally supervise?

18. How long is each laboratory period? *Factor = 1*

18a. Indicate whether you have technical support to set up and clear away for the laboratory periods. *Factor: Yes = 1 No = 2*

19. How many practical periods **per week** are there that you personally supervise?

20. How long is each practical period?

21. If this subject involves a tutorial programme, are you directly involved in working with these tutors ?

22. How many hours **per week** would this involve?

23. How many hours **per week** do you allocate for formal student consultation (include timetabled and unscheduled student consultation)

23a. How many hours **per year** would you spend on special teaching projects (eg. Online teaching materials development, new laboratory projects, etc.)

Please provide details

NOTE: IF YOU OFFER THIS SUBJECT TO MORE THAN ONE GROUP (IE. ENGLISH CLASS AND AFRIKAANS CLASS OR IN TWO DIFFERENT PROGRAMMES) COMPLETE THIS ANALYSIS FOR EACH GROUP

MOVE TO ANOTHER SUBJECT
MOVE TO ANOTHER DIMENSION

COURSE DESIGN AND ADMINISTRATION

24. If you are involved in curriculum development or redesign how many hours **per week** would this activity require?

Please provide details

25. If you are a subject co-ordinator, how many subjects do you co-ordinate? *Allocation = 1 hour per week per subject*

26. Are you a departmental head (ie you take responsibility for a Diploma/B.Tech course or a number of courses)? *Allocation = 4 hours per week (Note: Humanities group allocated 12 hours per week)*

26a. If you are required to moderate exam question papers
how many *Allocation = 4 hours per question paper*

26b. If you are required to moderate exam scripts
how many batches (each batch is regarded as 20 papers - if you would need to moderate more than 20 papers per batch increase the number of batches accordingly) *Allocation = 6 hours per batch*

26c. If you are required to moderate tests and/or assignments
how many batches (each batch is regarded as 20 - if you would need to moderate more than 20 per batch increase the number of batches accordingly) *Allocation = 3 hours per batch*

27. If you are you involved in student selection how many hours per year would this require?

28. Are you involved in student registration? *Allocation = 8 hours per registration cycle*

28a. Are you involved with student orientation? *Allocation = 4 hours per registration cycle*

29. How many additional hours per week would you spend on departmental administration? (include duties such as setting up timetables, examination administration, supervision of technical staff, etc.)

29a. If you have other specific responsibilities (eg. First year programme co-ordinator, peer helper programme supervisor, tutor co-ordinator) list these below and indicate how many hours per week these responsibilities would require.

Please provide details

COMMITTEE AND PROFESSIONAL INVOLVEMENT

30. On how many formal Technikon committees (including liaison committees) do you serve?

As chairperson *Allocation = 6 hours x 4 meetings*

Please provide details

31. As full representative *Allocation = 2 hours x 4 meetings*

Please provide details

32. As secundus *Allocation = 2 hours x 1 meeting*

Please provide details

32a. As secretary *Allocation = 6 hours x 4 meetings*

Please provide details

33. How many hours per week would your involvement with professional bodies require?

Please provide details

33a. If you are involved in organising conferences, or marketing courses, how many hours per year would this require?

Please provide details

CO-OPERATIVE EDUCATION

34. How many co-operative education students are you responsible for placing? *Allocation = 8 hours per student*

35. How many co-operative education students do you visit or monitor? *Allocation = 2 hours per student x number for question 36*

36. How many times do you visit or monitor each student in the space of 1 year?

36a. If you have to formally evaluate students' workplace projects or "log books", how many students would you evaluate?

36b. How long would each evaluation take?

RESEARCH INVOLVEMENT

If you are formally registered for a further qualification at what level is it?

37+38 Diploma or undergraduate degree level part time - number of subjects

Allocation 1 hr per week per subject (no allocation for first 2 subjects)

39. Honours/B Tech level part-time - number of subjects

Allocation 1 hr per week (no allocation for first subject)

40. Masters degree by course-work

Allocation 3 hr per week

41.	Masters degree by thesis -	Year 1	*Allocation = 100 hrs*
		Year 2	*Allocation = 150 hrs*
		Year 3	*Allocation = 75 hrs*
		Year 4	*Allocation = 50 hrs*
42.	Doctoral degree	Year 1	*Allocation = 200 hrs*
		Year 2	*Allocation = 300 hrs*
		Year 3 or subsequent	*Allocation = 150 hrs*

If you are involved as **chief** supervisor, indicate at what level:

43.	B Tech level - how many		*Allocation = 40 hrs*
43a	M tech level pre-registration - how many		*Allocation = 50 hrs*
44.	M Tech level - how many -	full thesis	*Allocation = 100 hrs*
		Half thesis	*Allocation = 75 hrs*
44a	D Tech level pre-registration - how many		*Allocation = 50 hrs*
45.	D Tech level - how many		*Allocation = 200 hrs*

If you are involved as **co-supervisor**, indicate at what level:

46.	B Tech level - how many		*Allocation = 20 hrs*
46a	M Tech level pre-registration - how many		*Allocation = 25 hrs*
47.	M Tech level - how many -	full thesis	*Allocation = 40 hrs*
		Half thesis	*Allocation = 30 hrs*
47a	D Tech level pre-registration - how many		*Allocation = 20 hrs*
48.	D Tech level - how many		*Allocation = 80 hrs*

49. If your are involved in other research projects, indicate the approximate number of hours per week, averaged over the year, you would spend on these projects

Please provide brief details of these projects:

Are you intending to present any conference papers

50. National conferences - how many *Allocation = 80 hrs*
51. International conferences - how many *Allocation = 80 hrs*
51a How many weeks away from the Technikon will you be spending at conferences during the course of the review period?

Are you intending to publish any articles
52. Articles in informal publications - how many *Allocation = 5 hrs*
53. Articles in non-subsidised journals - how many
Allocation = 50 hrs
54. Articles in subsidised journals - how many *Allocation = 50 hrs*

55. How many books in your academic field are you intending to publish as sole author during the course of the next review period?
Allocation = 200 hrs

55aa How many books in your academic field are you intending to publish either as co-author or contributor. (Calculate the number of hours allocated on the basis of a percentage contribution.)
Allocation = % of 200 hrs.

55a. How many hours per week is required by your involvement in an editorial capacity with any academic or professional journals or publications?

Please provide details

56. How many hours per week, averaged out over the year, are spent on artifact production.

Please provide details

CONSULTATION AND COMMUNITY SERVICE

57. How many hours per week do you spend in consultation/professional practice?

58. How many hours per week do you spend on direct community service? (ie. Career guidance to schools, community talks related to subject field, judging science olympiads, etc.)

Please provide details:

59. How many hours per week are you involved in Technikon-related sporting or cultural activities? (NOTE: For seasonal sporting activities average these across the entire year.)

Please provide details:

59a. How many hours per year would you spend on preparing and/or presenting regional or national workshops or presentations?

Please provide details

59b. How many hours per year would you spend on liaising with industry with a view to obtaining financial support, donations "in kind", research projects, etc.

Please provide details

PERSONAL PROFESSIONAL DEVELOPMENT

60. How many hours per year are spent on industry placement or commercial updating (in certain fields, for example industrial relations, this might include subject updating)?

Please provide details

61. How many hours per week are spent on formal teaching development activities?

Please provide details

62. How many hours per week are spent on formal staff development activities?

Please provide details

APPENDIX D

FINAL REFINED ALGORITHM

Weeks in the academic year				43											
Weeks in a semester				21.5											
Teaching weeks in a year				34											
Teaching weeks in a semester				16											
Expected hrs per week				50				AIM	2150		% LOAD	0.046512			
								TOTAL	1		% TEACH	0			
				SUBJECT 1			0	SUBJECT 2		0	SUBJECT 3		0	SUB	
	Question No	Choices	Factor	Input	Formula	Result		Input	Formula	Result	Input	Formula	Result	Inpu	
SUBJECT	1	faculty													
TEACHING	2	its code													
	3 = level	1	weighting = 1.7/2												
		2	weighting = 1.5/2.1												
		3	weighting = 1.5/2.8												
		4	weighting = 1.7/3.1												
		5	weighting = 1.8/3.6	0				0			0				
	4 = students			0				0			0				
	5 = duration	year	34 teaching weeks												
		semester	16 teaching weeks												
		term	8 teaching weeks												
		block rele	number of weeks	34				0			0				
	6 = periods			0		0	0	0		0	0		0		
	6a = period length	minutes	divide by 60	0		0		0		0	0		0		
	7 = experience	yes	weighting = 1												
		no	weighting = 1.5	0				0			0				
	7a=new subject	yes	weighting = +0.5	0				0			0				
	8 = course design	yes	40 hours												
		no	0 hours	0		0	0	0		0	0		0		
	9 = notes	yes	100 hours												
		no	0 hours	0		0	0	0		0	0		0		
	10 = exam	yes	weighting = 1												
		no	weighting = 0	0				0			0				
	11 = exam setting	yes	20hrs (+ 0.25hrs per student)												
		no		0	0			0			0				
	11b = no of papers				0			0			0				

11c = exam nature	short	weighting = 0.5										
	long	weighting = 2										
	mixture	weighting = 1	0	0	0	0	0	0	0	0		
11d=level	level 1	factor = 1										
	level 2	factor = 1.2										
	level 3+	factor = 1.5	0			0			0			
12 = no of tests		3 hours for setting	0	0	0	0	0	0	0	0		
		weighting = 0.15hrs		0	0		0	0		0		
13 = test length	1 hr	weighting = 1										
	2 hr	weighting = 2										
	3 hr	weighting = 3										
	longer	weighting = 4	0			0			0			
14 = test nature	short	weighting = 0.5										
	long	weighting = 2										
	mixture	weighting = 1	0			0			0			
15=major individ projects		0.75 hour per project	0	0	0	0	0	0	0	0		
15a=regular projects		0.15 hrs per project	0	0	0	0	0	0	0	0		
16 = group projects		1 hour per project	0			0			0			
16a = group size		divide by group size	4	0	0	4	0	0	4	0		
17 = lab periods			0			0			0			
18 = length of labs		1 hour										
		2 hours										
		3 hours	0	0	0	0	0	0	0	0		
18a=lab support		suppport = 1										
		no support= x2	0			0			0			
19 = practical periods			0			0			0			
20 = length of pracs		1 hour										
		2 hours										
		3 hours	0	0	0	0	0	0	0	0		
21 = tutorial	yes	weighting = 1										
	no	weighting = 0	0			0			0			
22 = tutorial hours		hours per week	0	0	0	0	0	0	0	0		
23 = student consultation		hours per week	0	0	0	0	0	0	0	0		
23a= teach projects		hours per year	0	0	0	0	0	0	0	0		

COURSE DESIGN AND ADMIN	24 = curric deve	yes	hours per week	0		0	0
	25=subject coord	yes	1 = 1 hr per week				
		no	weighting = 0	0		0	0
	26 = Dept head	yes = 1	weighting = 4hr pw				
		no	weighting = 0	0		0	0
	26a=q p moderate		number x 4 hrs	0		0	0
	26b=script moderate		no of batches x 6 hr	0		0	0
	26c=test/assign mod		no of batches x 3 hr	0		0	0
	27 = Stud select		number of hours	0		0	0
	28 = Stud registr	yes = 1	8 hours				
		no	weighting - 0	0		0	0
	28a=Stud orientation		4 hours	0		0	0
	29 = Addit admin		hours per week	0		0	0
	29a=specific respons		hours per week	0		0	0
COMMITTEE & PROFESS INVOLVE	30 = *Comm chair*	*number*	*6 hrs x 4 meetings*	0		0	0
	31 = Comm rep	number	2 hrs x 4 meetings	0		0	0
	32 = Comm secun	number	2 hrs x 1 meeting	0		0	0
	32a=Comm secret	number	6 hrs x 4 meetings	0		0	0
	33 = Prof bodies	number	hrs per week	0		0	0
	33a=conf organis	hours	hours per year	1		1	1
COOP ED	34 = Stud placem	number	8 hrs per student	0		0	0
	35 = how many st	number	2 hrs per student	0			
	36 = how many vis	number		0		0	0
	36a=logbook eval	no student		0			
	36b=evaluation	hours	number of hours	0		0	0
RESEARCH INVOLVE	37 = p-t subjects	no of sub	0 for 1-2, 1 hr pw	0	??		no credit for first 2 subjects?
	38 = p-t subjects	no of sub	0 for 1-2, 1 hr pw	0	??		no credit for first 2 subjects?
	39 = B Tech p-t	no of sub	1 hr per week	0		0	0
	40 = M course wrk	yes	3 hrs per week	0		0	0
	41 = M thesis	yr 1	1 = 100 hrs	0		0	0
		yr 2	1 = 150 hrs	0		0	0
		yr 3	1 = 75 hrs	0		0	0
		yr4	1 = 50 hrs	0		0	0
	42 = Ph D thesis	yr 1	1 = 200 hrs	0		0	0

		yr 2	1 = 300 hrs	0	0	0
		yr 3	1 = 150 hrs	0	0	0
	43 = super B Tech	number	40 hrs	0	0	0
	43a=pre-registr	number	50 hrs	0	0	0
	44 = super M Tech	no half	75 hrs	0	0	0
		no full	100 hrs	0	0	0
	44a=pre-registr	number	50 hrs	0	0	0
	45 = super D Tech	number	200 hrs	0	0	0
	46 = co-sup B Tec	number	20 hrs	0	0	0
	46a=pre-registr	number	25 hrs	0	0	0
	47 = co-sup M Tec	no half	30 hrs	0	0	0
		no full	40 hrs	0	0	0
	47a=pre-registr	number	20 hrs	0	0	0
	48 = co-sup D Tec	number	80 hrs	0	0	0
	49 = research proj	hrs p wk		0	0	0
	50 = nat conf pape	number	80 hrs	0	0	0
	51 = int conf paper	number	80 hrs	0	0	0
	52 = informal pub	number	5 hrs	0	0	0
	53 = non-subsid jo	number	50 hrs	0	0	0
	54 = subsidised jo	number	50 hrs	0	0	0
	55 = academic bks	number	200 hrs	0	0	0
	55aa=part author	%	200 hrs/%	0	0	0
	55a=editorial act	hrs p wk		0	0	0
	56 = artifact prod	hrs p wk		0	0	0
CONSULT &	57 = consultation	hrs p wk		0	0	0
SERVICE	58 = comm serve	hrs p wk		0	0	0
	59 = sport & cult	hrs p wk		0	0	0
	59a=workshops	hrs p yr		0	0	0
	59b=finding suppo	hrs p yr		0	0	0
PERSONAL	60 = industry place	hrs p yr		0	0	0
PROFESS	61 = teaching dev	hrs p wk		0	0	0
DEVELOP	62 = staff develop	hrs p wk		0	0	0

APPENDIX E

LIST OF INVITED PARTICIPANTS

Mrs S Riordan, Faculty of Management
Mrs V Potterton, Faculty of Natural Sciences
Mr V Archer, Faculty of Engineering
Prof A Slabbert, Faculty of Management
Mr W Lotter, Acting Dean, Faculty of Business Informatics
Mr C Whaits, Faculty of Engineering
Mr G Leigh, Faculty of Engineering
Dr P Marais, Faculty of Engineering
Mr F Nel, Faculty of Management
Dr C Barrett, Faculty of Management
Dr C Bakkes, Faculty of Natural Sciences
Mr D Botha, Faculty of Management
Mr J Bothma, Faculty of Business Informatics
Mrs X Cupido, School of Hotel and Catering Studies
Mrs K Evans, Faculty of Design and the Built Environment
Mr WAJ Smith, Acting Director School of Teacher Education
Mr WA Nel, Faculty of Engineering
Prof P Slatter, Faculty of Engineering