

UK Higher Education Space Management Project

Space utilisation: practice, performance and guidelines



Two of the front cover images, of the Jewellery School (top right) and the Library (bottom) are courtesy of UCE Birmingham.

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Executive summary

Scope of the study

This study was commissioned by the UK Higher Education Space Management Group (SMG). It reviews practice and performance in space utilisation and develops additional guidelines for taking a strategic approach to utilisation.

Definition of utilisation

Space utilisation is a measure of whether and how space is being used. The utilisation rate is a function of a frequency rate and an occupancy rate. The frequency rate measures the proportion of time that space is used compared to its availability, and the occupancy rate measures how full the space is compared to its capacity. Utilisation rates can be assessed in terms of both actual use and predicted use.

Strategic role

Space utilisation is a strategically important space management measure. Phase one of the SMG's work developed tools to help higher education institutions (HEIs) to assess what size of estate is affordable. It calculated the cost of having an estate that is kept fit for purpose and in good condition.

Assessments of what is affordable need to be linked to the type and amount of space that is required. Utilisation studies provide information on how space is being used and help to inform decisions about the type and scale of facilities needed. They raise questions about the most effective use of resources. If space is not being used, is it needed and does it need to be funded? Could the resources consumed by under-used space be better directed elsewhere?

Current performance

Most HEIs collect some data on utilisation. The main focus is on teaching space. The Estate Management Statistics (EMS) project reports data for the sector on the utilisation of teaching space. Data for 2003-04¹ show that the median reported utilisation rate was 27 per cent over a core teaching week. Out of the total available time, rooms were reported as being used for just

over half the time, and when they were used, they were found to be just under half full. Nearly three-quarters of the available teaching workplace/hours were not in use across the week.

Challenges

Although HEIs have objectives and targets for increasing utilisation, there has been relatively little change in sector-wide rates in recent years. There are many factors which operate independently or in combination to depress utilisation. One of these is a marked difference between predicted and surveyed rates of utilisation. Other factors include teaching and learning trends, whether or not detailed information is available on what space is needed, and the nature of the estate in terms of its fitness for purpose and versatility.

Balancing costs and benefits

Despite these challenges, it is important to optimise utilisation. There is a balance between minimising cost and meeting the pedagogical and research needs of staff and the learning and support needs of students. This balance will vary between HEIs, but when decisions are made about what is the optimum level, it is advisable to be aware of the opportunity costs of low utilisation. Effective utilisation of space also creates a good match between space needs and space provision, and helps to improve the staff and student experience.

Measuring opportunity cost

A tool called the inefficiency multiplier can be used to give insight into the opportunity costs. The inefficiency multiplier describes the amount of space being provided at a given level of utilisation for every m² in use. At the EMS reported rate of 27 per cent in the data for 2003-04, 3.7 m² is being provided for 1 m² being used. The higher the rate of utilisation, the less space that is being provided; the lower the rate, the greater the space being provided for every m² in use. As a corollary, a low level of utilisation will lead to a high cost of space to support a given activity, and a low ratio of income per m².

¹ References to data for 2003-04 in this report are from the EMS institutional report 2005.

Aggressive targeting of very low levels of utilisation can have a major impact on cost. Moreover, because of the non-linear relationship between utilisation rates and space provision, where utilisation is very low, a small increase can have a significant impact on the amount of space provided and on the attendant cost.

Guidelines for a strategic approach to utilisation

The guidelines contained in this report are not intended to supersede existing good practice advice. They aim to extend that guidance to assist HEIs in taking a strategic approach to utilisation.

For utilisation levels to rise significantly there needs to be either an increase in activity and/or a decrease in the amount of space. In the absence of either, the effects of the inefficiency multiplier and the space costs carried by HEIs will be unchanged. The links to the overall estate strategy for HEIs and to the assessment of the affordable estate are essential drivers for optimising utilisation performance.

The guidelines discuss ways of collecting the relevant data on both predicted and actual utilisation; evaluating current performance and the reasons for it; calculating the inefficiency multiplier; reviewing targets; and developing measures to optimise utilisation. They highlight the benefits of:

- extending assessments beyond teaching space to look at the use of different types of HE space
- linking utilisation to the SMG tools of benchmarking the size of estate and calculating what is affordable for individual HEIs
- using the inefficiency multiplier to analyse existing utilisation and set utilisation targets for the level at which HEIs wish to operate
- using the inefficiency multiplier to focus on buildings or types of space with particularly low levels of utilisation and assessing the opportunity costs

- linking targets for different types of space to optimisation of predicted uses
- building the results into the estate strategy with the aim of delivering the appropriate and affordable size of estate
- securing top-level support within HEIs for optimising utilisation and for measures designed to effect institutional change.

1 Introduction

1.1 The Space Management Project

The brief for this study was to review space utilisation practice and performance and to consider the scope for updating guidance on utilisation for higher education institutions (HEIs). It has been prepared by Kilner Planning.

This study is part of phase two of the Space Management Project (SMP). The project is under the direction of the UK Higher Education Space Management Group (SMG), supported by the four UK funding bodies for higher education, the Higher Education Funding Council for England (HEFCE), the Scottish Funding Council (SFC), the Higher Education Funding Council for Wales (HEFCW) and the Department for Learning and Employment (in Northern Ireland), DEL.

1.2 Scope of the report

This report sets out the results of the research. It covers the following:

- how space utilisation is usually defined in higher education
- the reasons for revisiting it as part of the SMP
- performance and practice in the sector

- reasons why utilisation rates may be low and difficult to raise
- the strategic importance of space utilisation
- guidelines for a strategic approach to utilisation.

1.3 What is space utilisation in higher education?

In higher education (HE) in the UK, space utilisation is usually defined as a measure of how rooms and spaces are being used – both in terms of how often rooms are used and, when they are in use, how many people are in them. The National Audit Office's (NAO) Space Management in Higher Education: A Good Practice Guide (1996) sets out the standard calculation:

$$\frac{\% \text{ frequency} \times \% \text{ occupancy}}{100} = \text{space utilisation}$$

Where:

- Frequency is the number of hours a room is in use as a proportion of total availability (the timetabled week)
- Occupancy is the average group size as a proportion of total capacity for the hours a room is in use.

Overview of the UK HE space management project

All published reports are available on the web at www.smg.ac.uk under Reports/tools.

Phase one	Review of practice	July 2005
	Drivers of the size of the HE estate	July 2005
	The cost of space	July 2005
Phase two	Promoting space efficiency in building design	March 2006
	Impact on space of future changes in higher education	March 2006
	Managing space: a review of English further education and HE overseas	September 2006
	Space utilisation: practice, performance and guidelines	September 2006
	Review of space norms	September 2006
	Space management case studies	September 2006
	Space management project: summary	September 2006

Utilisation may be calculated as planned utilisation based on assumptions about how space will be used, for instance using data from timetables or assumptions about projected levels of use in a new building. Alternatively, it can be a measure of how space is actually being used, based on observation.

Measuring space utilisation and aiming for improvements are not new topics in HE. A summary is given in Annex 1 of the main milestones in guidance both for surveyed utilisation and for planned use of space. Emphasis on space utilisation as a performance indicator for effective space management arose principally from the recommendations of the NAO in its report 'The Management of Space in Higher Education Institutions in Wales' (1996).

The NAO concluded that space utilisation surveys provide the only objective measure of the efficiency with which the estate is used. It stated:

'Space, like time, is money. If your institution is typical, servicing and maintenance of accommodation is the second largest cost it has to bear. Without efficient space management, the resources tied up in your institution's estate are not used to best effect. Reducing estates costs by using space more efficiently can release funds for other more important activities.'

The NAO went on to note that there is scope to improve utilisation, thereby enabling institutions to:

- make more intensive use of existing accommodation
- reduce the need to provide additional space
- identify the scope to reduce the size of the estate
- facilitate a better match between the accommodation provided and user demands
- enable HEIs to respond promptly to changes in user requirements.

Since the NAO made its recommendations, HEIs have collected increasing amounts of data on utilisation. Many have monitored utilisation

rates and set targets to improve the intensity and efficiency of space use.

1.4 Reasons for this study

Recently, however, some HEIs have raised concerns about using space utilisation as a key determinant of good space management practice. In summary, the issues include the following:

- a. Measurements of utilisation provide information, but they do not in themselves deliver space management solutions.
- b. High rates of utilisation do not necessarily mean that space is being managed effectively. Staff and students may complain about lack of space, overcrowding and the adverse effect on academic activity, recruitment and retention.
- c. Many institutions have found that utilisation rates have changed relatively little despite endeavours to increase the intensity of space use. As Education and Learning Wales (ELWa) noted in 2002: 'utilisation rates have not changed to any significant extent over the last decade, remaining relatively low across the sector'. But the amount of space per full-time equivalent (FTE) student has fallen. The Estate Management Statistics (EMS) Annual Report for 2004 (HEFCE report 2004/45) noted that across the sector the area of teaching space had stayed reasonably constant over the preceding three years, despite an 8.2 per cent increase in FTE taught students. 'Fifty per cent of estates are now able to operate with less than 8.4 m² of net space per student compared with 42 per cent of institutions in 2000.' Some have argued that the amount of space per student or per member of staff is a more useful space management performance indicator than space utilisation rates.
- d. It is possible to have HEIs with similar utilisation rates but very different areas of space per person, where there are significant differences in the areas per workplace for similar activities.

- e. Collecting data involves time and money. It could be argued that the resources could be better spent on other space management measures, because the data can be unwieldy and difficult to interrogate and analyse. Utilisation survey results may not be integrated with space need assessments, fed back into timetabling or linked with other management information systems.
- f. Space utilisation is usually assessed for a relatively small proportion of the total non-residential floor area. On average, in the data from 2003-04, HEIs reported on 52 per cent of their core teaching space. This was around 15 per cent of the total non-residential net internal area. Surveys will often cover the stock of pooled teaching rooms, but large areas may be unaccounted for, such as specialist teaching space, research areas, offices and support space. Offices, for instance, made up around 24 per cent of the total area.
- g. There is little in the way of sector-wide advice about what constitutes good practice in levels of use, which makes setting targets and monitoring progress problematic.
- h. Variations in the way surveys are conducted make comparisons of results between institutions difficult. Variables include the types of rooms surveyed, the hours covered, the basis on which capacities are calculated, and whether reports are provided on the basis of a planned use of space or observations of how space is being used.

The study was carried out against this background. Research drew on EMS and the sector-wide survey of space management practices carried out in 2004, which is the subject of a separate SMG report called 'Review of practice'.

2 Practice and performance

This section looks at why and how HEIs measure utilisation, and discusses space utilisation performance and targets.

2.1 Why HEIs measure utilisation

During phase one of the SMP, a survey was carried out of space management practices across the sector. As part of the survey, HEIs were asked why they measured utilisation. The range of reasons given included:

- seeking the best match between space needs and space provision
- providing a basis for allocating space or planning new buildings
- monitoring efficiency in space use
- highlighting areas of under-use and over-use
- identifying the differences between timetabled use and actual use
- tracking changes over time
- feeding information into EMS
- demonstrating good practice.

Some were seeking information on specific parts of the estate or room types. Others were monitoring utilisation more generally and checking results against their own targets.

2.2 Collecting data

Some HEIs regularly collect comprehensive data on both timetabled and actual use of space, including areas other than teaching rooms, such as research, library and office space. Others may just examine utilisation of individual buildings on an ad hoc basis.

The survey found that general purpose teaching space is the most common type of space to be surveyed, especially pooled rooms, followed by at least some specialist teaching space. Research space, libraries and catering areas are surveyed less often, although many HEIs make an annual return to the Society of College, National and University Libraries (SCONUL) on library utilisation. Academic offices are surveyed more often than support offices. Where institutions

specified other types of space surveyed, the main examples were open access computing rooms, meeting rooms and workshops.

The SMP survey asked institutions to summarise the method used to collect utilisation data. Where physical surveys are carried out, the majority of respondents did hourly checks on rooms in line with NAO guidance and EMS definitions. Most made a note of actual headcount. Others gave estimates of occupancy, for example rooms were assessed as being 0-10 per cent, 11-20 per cent full; or 0-25 per cent, 26-50 per cent full. Some did not collect data on occupancy levels, and focused solely on frequency rates. This is often on the grounds that they have much greater control over the frequency with which rooms are used, whereas occupancy rates are highly dependent on whether students and other users choose to attend.

Usually, surveys were carried out over a period of a week. In some cases, surveys were over a two- or three-week period to smooth out variations in the timetable. A small number of HEIs have continuous observed assessments of utilisation.

Some HEIs do not carry out surveys. Instead, they use scheduled activities and planned group sizes to assess predicted utilisation rates.

When the data have been collected and analysed, the findings are generally circulated within HEIs. Figure 1 shows that information is most commonly circulated to the senior management team/executive, committees and space management groups, and to deans/heads of departments. A small number of survey respondents said that results were made available to all staff.

2.3 Current utilisation rates

EMS collects data annually from HEIs on space utilisation. It asks HEIs to provide data based on use over the standard core working day of 0900 to 1700 Monday to Friday. Based on data from 2003-04, the results for the sector in the EMS institutional report issued in 2005² were:

Median frequency	54%
Median occupancy	49%
Median utilisation	27%

An example of the continuous audit process

'(The HEI) moved from 40 surveyors getting detailed information on one week, to auditing over 20 weeks with two surveyors. As a result:

- a. Each space is still audited for at least a week but the auditing days are spread over the academic year. As a result, the interests of those disadvantaged by the one week process are taken into account although their spaces are still audited when not in use and no special allowance is made in the audit schedule for these periods.
- b. By spreading the process out, the intrusiveness of the audit has been reduced and is much more part of everyday life.
- c. Whatever difficulties arise during the audit are dealt with appropriately before that area is next visited, rather than remaining as an unsolved problem.
- d. There is a small team (two agency staff) carrying out the audit and this makes the management of the process much easier from the estates department's point of view and allows much closer checking on the process to ensure accuracy and completion.'

² The 2006 EMS report has been issued since the preparation of this report. The median utilisation rate for 2004-05 showed little change from the figures reported and analysed here. It was 26 per cent.

Figure 1: Circulation of utilisation survey results within HEIs

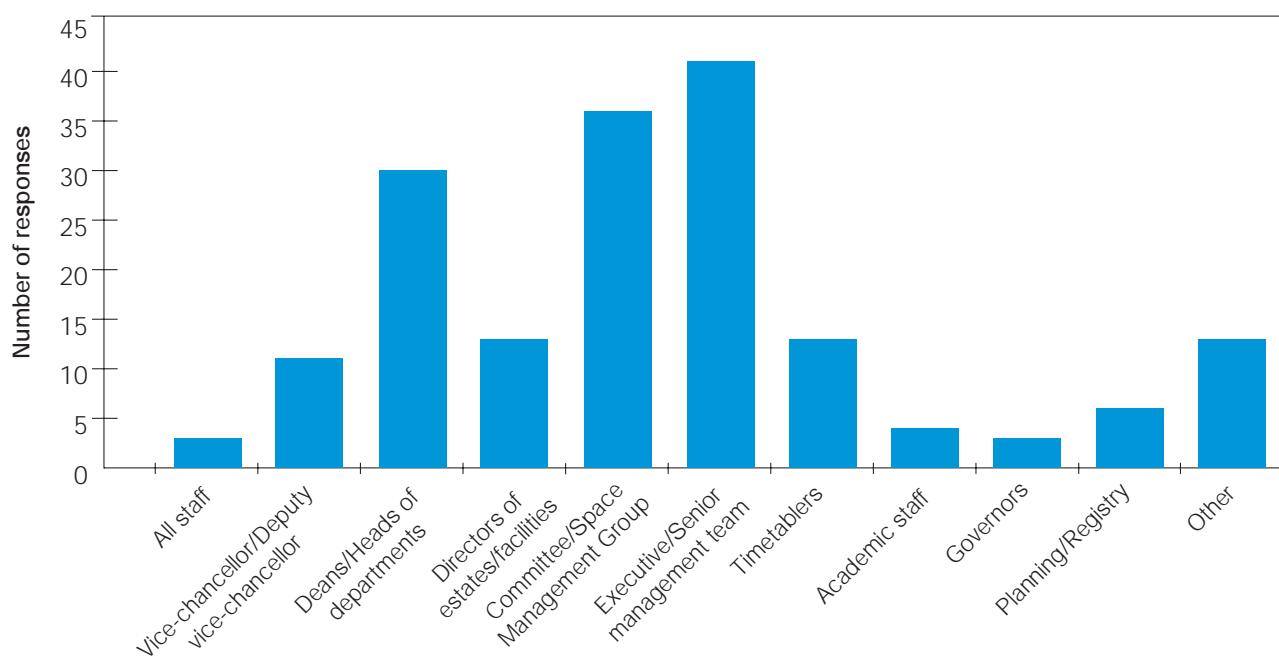


Table 1 contains more detail. It shows a lower quartile utilisation rate of 19 per cent and an upper quartile of 36 per cent. It also shows that the proportion of teaching space for which utilisation data were provided varied widely between HEIs. The median was a 41 per cent coverage rate. The lower quartile was 25 per cent and the upper quartile was 86 per cent.

In providing the EMS data, HEIs are asked to identify whether frequency rates are based on the timetabled 'predicted' use of rooms or on surveyed use, and whether occupancy rates are based on theoretical 'predicted' size of the group to be occupying a room or a survey-based method. The figures in Table 1 combine the data from both predicted and survey-based approaches.

The rates from the two approaches are presented separately in Figure 2 and Table 2.

There is a difference between predicted and surveyed rates, with the predicted or timetabled use being higher. The data suggest that, on average, nearly 18 per cent of timetabled events are not taking place, and that observed group sizes are 27 per cent smaller than predicted.

EMS focuses on teaching space, and there is little information available on utilisation rates for other types of space, with the exception of libraries for which SCONUL issues statistics annually. Its report for 2003-04 notes that on average there were 9.7 FTE students for every available seat and that 38 per cent of seats were occupied at the surveyed times. A comparison of

Table 1: EMS utilisation data 2003-04

Rates	Median	Lower quartile	Upper quartile	Mean	Availability ratio
Frequency rate – teaching space	54%	47%	66%	56%	76%
Occupancy rate – teaching space	49%	40%	63%	50%	70%
Utilisation rate – teaching space	27%	19%	36%	29%	68%
Occupancy/frequency rate coverage as % of core teaching net internal area	41%	25%	86%	52%	61%

Figure 2: EMS predicted and surveyed mean utilisation rates 2003-04

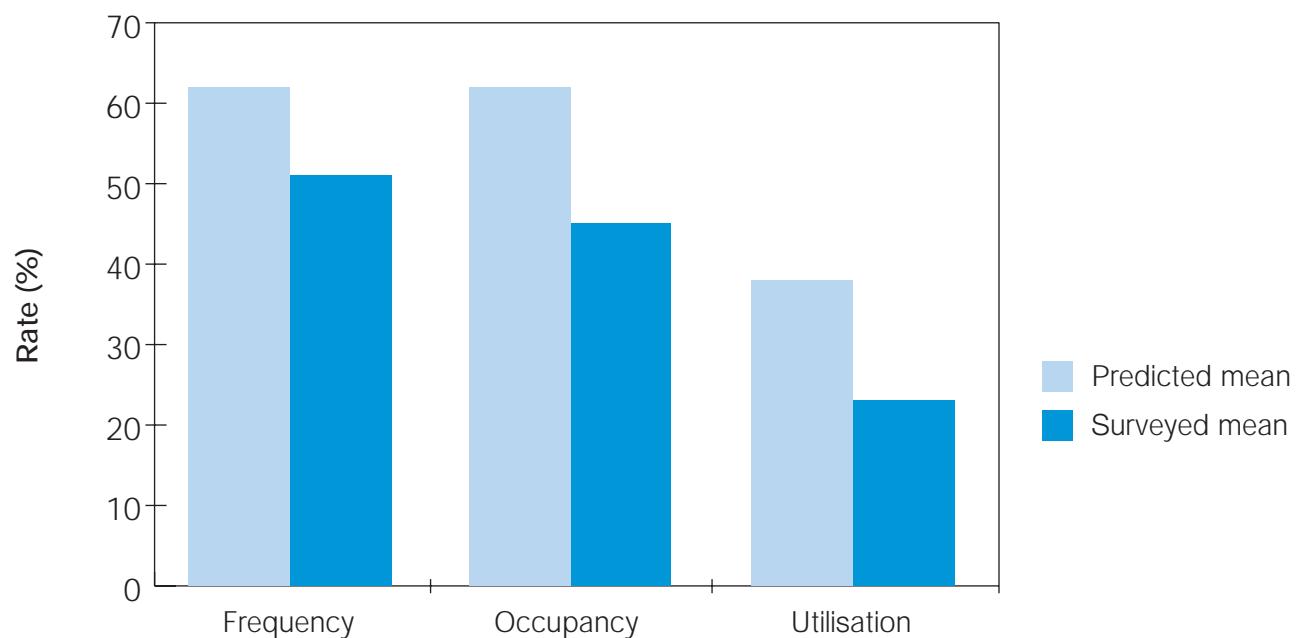


Table 2: EMS predicted and surveyed mean utilisation data 2003-04

Rates	Predicted mean	Surveyed mean	Difference between predicted and surveyed mean
Frequency rate – teaching space	62%	51%	11%
Occupancy rate – teaching space	62%	45%	17%
Utilisation rate – teaching space	38%	23%	15%

utilisation rates for teaching and library spaces should be treated with caution because of some differences in the parameters for data collection.

2.4 Trends in utilisation

Tracking trends in utilisation is made difficult because until recently, through EMS, data have not been reported on a regular basis. From the data which are available, however, the picture over recent years is one of relatively little change in teaching space utilisation. The median for predicted and surveyed utilisation combined has been around 25 per cent (see Table 3).

Looking further back, when the NAO carried out detailed surveys at three institutions in Wales

some 10 years ago as part of its review of space management practice, the utilisation rates were 19, 20 and 22 per cent respectively. Two of those HEIs report utilisation data in EMS. In one case, the overall utilisation rate has risen from 20 to 23 per cent, and in the other from 22 to 24 per cent. Nor were there any major differences in reported frequency and occupancy rates. The amount of academic floor area has also stayed broadly constant, but both HEIs have seen major expansion in student FTE numbers, of 25 per cent and 35 per cent each. In effect, although the amount of space per FTE has declined, the utilisation rates have not changed greatly.

Table 3: Trends in space utilisation 2001-02 to 2003-04

EMS data	2003-04 median	2002-03 median	2001-02 median
Frequency rate – teaching space	54%	55%	54%
Occupancy rate – teaching space	49%	48%	48%
Utilisation rate – teaching space	27%	25%	26%
Occupancy/frequency rate coverage as % of core teaching net internal area	41%	47%	41%

2.5 HEIs' utilisation targets

Over the years, there have been many views on what might be achieved in terms of utilisation rates. These are discussed in Annex 1. Among these, the NAO noted in 1996 that its findings suggest that 'a figure of 50 per cent (for instance around 70 per cent frequency and 70 per cent occupancy) may prove to be a challenging target'. Around the same time, the Dearing Report noted that the Association of University Directors of Estates considered a rate of 35 per cent to be efficient. More recently, HEFCE 00/04, 'Estate strategies: a guide to good practice', grades utilisation in a sample estate strategy as follows:

- good is equal to or greater than a 35 per cent utilisation rate
- fair is a 25-35 per cent utilisation rate
- poor is equal to or less than a 25 per cent utilisation rate.

These targets refer to actual rather than predicted utilisation rates. Advice or assumptions about predicted rates have not been revised for many years. Assumptions were incorporated into University Grants Committee (UGC) and Polytechnics and Colleges Funding Council (PCFC) space norms, but there have been no updates of the norms since 1990.

Some HEIs have their own utilisation targets. The SMP survey found that where HEIs use performance indicators to manage space, utilisation rates were the most frequently cited indicator. Forty-five per cent of respondents said that they had space utilisation targets. Some examples of responses are set out below.

Examples of SMP survey responses on space utilisation targets

Answers to the question: 'Does your institution have space utilisation targets? If yes, please summarise below.'

- 80 per cent frequency
- achieve at least the fair rating in HEFCE 00/04 (25-35 per cent)
- target of 40 per cent for teaching accommodation
- 30 per cent
- to remain above the sector (upper quartile) of 35 per cent as reflected in the EMS return
- want to have above 20 per cent utilisation of teaching space
- target planned utilisation of 50 per cent for teaching space (76 per cent x 66 per cent)
- target is a good utilisation of space – above 35 per cent across all hours of use
- broad institution-wide target to increase utilisation to 23 per cent
- improve frequency rate for generic teaching space from 37 per cent to 50 per cent by 2007-08
- to achieve 50 per cent utilisation
- target observed utilisation is 49 per cent based on 70 per cent x 70 per cent
- currently over 90 per cent in teaching/practice annexe – aim to bring main building up to same level from 75 per cent
- frequency rate of 70 per cent or better
- to maximise the utilisation of all space – currently venues 81 per cent, other teaching 66 per cent, computer labs 42 per cent and libraries 63 per cent
- current rate is 36 per cent x 38 per cent – target is 45 per cent
- seek to achieve 30 per cent utilisation of teaching space.

How one HEI applies its space utilisation targets

'The estates department has a clearly defined timetabled percentage frequency of use target for general teaching space (65 per cent). The amount of classroom space on campus is kept at a level to meet that need. As and when the frequency of use rises into the 70-75 per cent region then increased resource would need to be provided and, by the same token, if usage falls well below 65 per cent then space could be reallocated to other uses where feasible.'

A similar target is sought in specialist teaching facilities, but is applied more flexibly to reflect special circumstances. For example, a room might contain particular equipment which is vital to the continuation of a particular course, but is only used infrequently. Or the timetabled activity in a room may be supplemented by private study use by students (performance spaces, computer labs). Before any judgements are made about specialist space, issues such as these will be considered.'

2.6 Summary

- Most HEIs collect some utilisation data. Most of the information available focuses on teaching space.
- Where data are available at the sector level for 2003-04, EMS reports a median utilisation of teaching space of 27 per cent, and SCONUL reports a mean library utilisation rate of 38 per cent (but the two figures are not directly comparable).
- The EMS median includes utilisation rates based both on surveyed data and on timetabled and predicted data. The surveyed rate is around 11 per cent lower than the predicted rate.

- Although the most common space management objective given in the SMP survey was to increase utilisation rates, rates reported in EMS over the last three years have stayed broadly constant.
- Some HEIs measure the utilisation of offices, research and other types of space, but this is far less frequent than surveys of teaching space.
- Where advice has been given on utilisation rates, it has also tended to focus on teaching space.
- There is wide variation in the utilisation targets which HEIs set for themselves.

3 Reasons for low utilisation

Despite the widespread adoption of utilisation targets and performance indicators, utilisation rates are low in parts of the sector, and it can prove difficult to achieve any significant increase. The causes of low utilisation are varied. They include changes in the way that teaching, learning and research are done, and mismatches with existing space; limited scope to reconfigure space; and issues of perception about how space is used. The problems may be greater for some types of space than others.

3.1 Methods of delivery

Many of the factors which depress utilisation levels are not new, for example placements on courses such as nursing and teaching, and setting up times in laboratories. Others have become more pronounced with changes in learning and teaching methods.

Space may well have been planned using norms based on a certain set of assumptions about how students in different disciplines would study and be taught, but that amount and type of space may not now be appropriate for new methods of delivery. For example, with the move towards more self-directed learning, there are fewer contact hours of teaching on many courses.

Increases in staff:student ratios and changes in course structures lead to different group sizes. In some specialist spaces, virtual learning

environments have replaced the need for large pieces of equipment. As one HEI noted: 'In general the lack of progress in increasing utilisation appears to be the result of a rapidly changing approach to teaching, set against a relatively unchanged stock of teaching spaces.'

In addition, greater student choice about course composition and the need to respond rapidly to market preferences mean less predictability in the amount and type of space that is needed. The introduction of e-learning and blended learning can also lead to changes in space need, and uncertainty about how many students will attend. Many of these factors also apply to research facilities. Space may have been provided to meet the needs of one project, but be unsuitable for another.

3.2 Limitations of the estate

A mismatch between the way an HEI now delivers its teaching, learning and research activities, and the assumptions about how the space would be used when it was originally planned, inevitably has an impact on utilisation. In many cases, it may be possible to change the type of space and reconfigure room size to get a better fit with current needs.

However, the opportunities for remodelling buildings or replacing poor quality space with fit-for-purpose accommodation may be restricted by cost or the method of construction. Buildings may be listed. It may be difficult to dispose of surplus space, or the underused space may be embedded in a building where an alternative use is hard to find.

Increases in utilisation can be limited by other characteristics of the estate, for instance:

- poor condition and functional suitability
- poor environmental quality
- split sites
- specialist spaces and equipment that have a limited range of uses
- accessibility and health and safety restrictions on space
- availability of audio-visual equipment and the layout of rooms.

3.3 Types of space

Some types of space are more difficult to measure in terms of frequency and occupancy levels than others. This is often the case with specialist space, particularly where it can only be used for one specific function. Some research areas, laboratories and studios may be occupied for limited periods of time, but house ‘work in progress’ that precludes other uses. Surveys of these types of space will often show low levels of utilisation in terms of occupancy by staff and students.

3.4 Availability of information

The SMP survey revealed that many space managers working centrally within HEIs may not know full details of room capacities and the number and type of workplaces, particularly in specialist areas or in non-centrally timetabled parts of the estate. They may not know real demand for space in terms of how many hours of what type of activity, or be involved at an early stage of developing strategic plans.

Based on 17 responses from HEIs to the telephone survey, access for managers to base data on contact hours and group sizes is mixed. Some do not have access. Some could have access but do not use the data. One respondent could get the data if necessary, but would need to go to four different sources. Others have partial information, such as for lecture theatres, but not for how many hours the specialist space is needed and what group sizes will occupy it. They may not know the number of workplaces available in different types of space. There is often even less information about how non-teaching areas are used. Without that information, it is very difficult to plan how much space is needed and to address the root causes of low utilisation.

3.5 Different interests and objectives

Space utilisation is a function of activities being undertaken by a wide range of people. While it may be in the interests of the overall financial health of an HEI to make efficient and effective use of space, that benefit may be remote to many users of space, including

academic staff, administrators and students. It might not be in everyone’s own immediate interests to promote higher utilisation and may even operate against them.

For example, institutions provide wide-ranging and flexible types of courses to attract students. Staff minimise risk by keeping options open on how many students may do which course, and may request facilities that would accommodate the maximum number. That overstates room requirements. Timetablers may over-provide hours for courses on the basis that it is worse to have too little than too much. The same applies to room allocation: there will be immediate and specific problems if there is not enough space, but not if too much is provided.

Elizabeth Shove, in her article ‘The black holes of space economics’, highlights the interdependent and sometimes conflicting interests of students, lecturers, timetablers, heads of departments, budget holders and administrators: ‘From this perspective, each has their own interest in space utilisation and each their own definition of effective space management.’

In these circumstances, overestimating the need for space is a rational response to uncertainty and a way of managing risk through the various stages of academic planning, recruitment, timetabling and room allocation. This is especially the case where space may still be viewed as a free good and in the absence of a plan to target low utilisation.

3.6 Timetabling and room allocation practices

Certain preferences and timetabling and room allocation practices contribute to low utilisation. They include:

- resistance to timetabling teaching sessions at the start and end of the day and on Friday afternoons
- basing room allocations on stated preferences rather than on the size and specification needed for a given activity

- requests for the use of several rooms at one time, even though not all of them will be needed
- requests for rooms for blocks of time that are longer than needed
- requests for rooms every week even when they might only be needed for part of a term or semester
- traditionally having lectures in the morning and practicals in the afternoon
- traditionally teaching at certain times, such as 1000 to 1200 on Tuesdays and Thursdays
- assumptions about what students want and when they want to attend.

Factors such as these lead to a bunching of demand and an overestimation of the amount of space needed, leaving areas under-used for substantial periods of the core week.

3.7 The gap between predicted and observed use

One reason that contributes to low rates of surveyed levels of utilisation is the gap between predicted and observed levels of use, both in terms of frequency and occupancy rates. The latter are heavily influenced by student choice and are in part outside HEIs' control. But the frequency rate is a factor which HEIs have more opportunity to address. To do that, data need to be readily available on what activities are scheduled and on what actually transpires. Without this information, it is hard to assess the scale of the difference and to take action to reduce it to get a better match between planned and actual use.

3.8 Perception and experience

A document issued by the Department of Education and Science in 1974 (DES Design Note 12) observed that empirical studies revealed that utilisation was far lower than was generally realised, but that even so, users of the buildings often felt that they were overcrowded. This is equally true over 30 years later.

It is possible to have complaints about lack of space at the same time as very low recorded levels of utilisation. It can arise when:

- a. Rooms are booked for much of the time, but a significant proportion of the activities do not take place, so people cannot book a room when they want one although rooms are lying empty.
- b. There are marked peaks of room use so at some times all the rooms are booked and there is unmet demand, but at others many rooms are empty. By definition most users will be there during the periods of intensive use and few people will see the empty rooms.
- c. There is a mismatch of group sizes and room sizes, or there are not enough rooms with the right equipment or of the right type, putting a disproportionate amount of pressure on part of the stock, while less popular rooms stay empty for much of the time.

If people's perceptions and experience run counter to the headline results from a utilisation survey, it can engender suspicion about the validity of the data collected and resistance to measures taken to increase levels.

3.9 Assessing space need

Space utilisation data are often used to inform decisions on space re-allocation and smoothing patterns of demand, and utilisation performance and targets feature in many estate strategies. However, for levels of utilisation to rise significantly there needs to be an increase in activity and/or a decrease in space. Space utilisation assessments are not always linked to the overall estate strategy for an HEI. The link is important to deliver significant change.

This issue of the strategic role of space utilisation is explored further in the next section.

4 The strategic role of utilisation

Many of the reasons why it can be difficult to increase utilisation are not just estates issues. Space utilisation is as much about people as about place. As well as refinements to methods of collecting and analysing utilisation data, space utilisation needs to be viewed in a broader context of how best to balance different interests and competing demands. One way is to look at utilisation as part of a balanced scorecard approach³ and to develop guidelines for its integration into strategic planning. The balanced scorecard approach to strategic management looks at ways of balancing the different perspectives within an organisation in terms of:

- the customer perspective
- the financial perspective
- the business (or internal HEI management) perspective

- the innovation and development perspective.

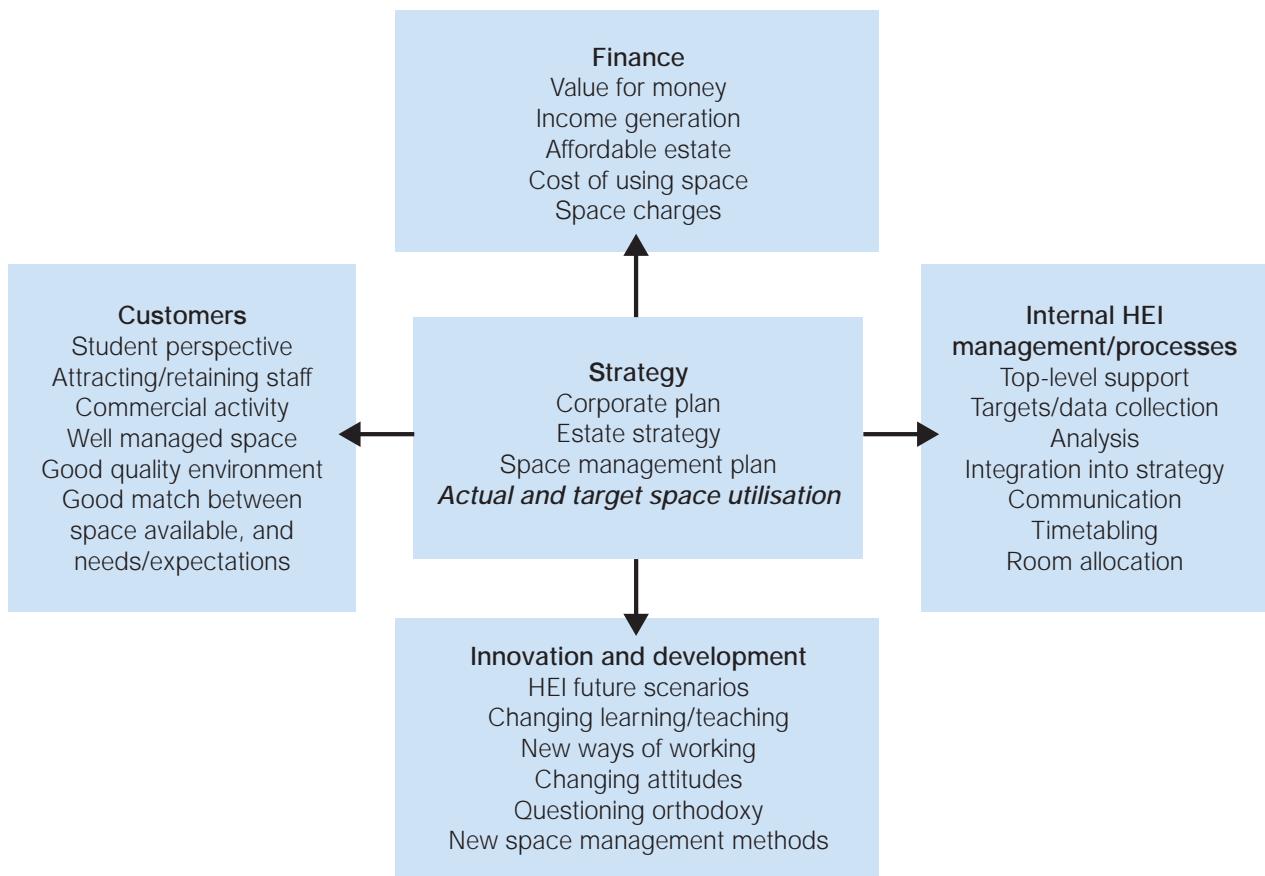
4.1 Utilisation and the balanced scorecard

Figure 3 sets out the key factors which have an impact on space utilisation.

4.2 Costs and benefits

The balanced scorecard demonstrates that utilisation is just one of many factors affecting the type and quantity of space to be provided. There is a balance between minimising costs and meeting the pedagogical and research needs of staff and the learning and recreational needs of students. The balance will vary between HEIs, but in making the decision, it is important to be aware of the opportunity costs of low levels of utilisation.

Figure 3: Key factors affecting space utilisation rates: a balanced scorecard approach



³ The balanced scorecard is an approach to strategic management developed by Robert Kaplan and David Norton of the Harvard Business School.

4.3 Opportunity costs of low utilisation

The SMG report ‘The cost of space’ assessed the cost of having an estate which is kept in good condition and fit for purpose. On average, across the sector the cost derived from 2003-04 data was:

- sustainable estate provision (operating costs, maintenance and depreciation) – £162.40 per m²
- total estate provision (sustainable estate provision plus an opportunity cost of capital) – £215.30 per m².

The SMG model is designed to help HEIs to assess what size of estate is affordable.

Calculations of what is affordable in turn need to be linked to what is needed. If space is not being used, is it needed and does it need to be funded? Could some of the resources that are being consumed by the estate be used by HEIs for other purposes? Space utilisation is a measure of whether and how space is being used. It is a strategically important space management issue.

As discussed in section 2 of this report, the median reported utilisation rate for teaching space in the EMS data for 2003-04 was 27 per cent. At this rate, out of the total available time in the standard teaching week, rooms were reported as being used for just over half the time, and when they were used they were just under half full. Nearly three-quarters of the available teaching workplace/hours were not in use across the week. The data reported in EMS are mostly based on a core week of Monday to Friday during term. If the analysis were extended to cover a longer working day or use outside term time, then the overall utilisation rate would fall.

For the 83 per cent of HEIs that provide core teaching space data, the total is some 3.38 million m². The estate is a valuable resource and one that is costly to sustain. Financial memoranda require HEIs to secure value for money in the use of their assets.

4.4 Inefficiency multiplier

The term inefficiency multiplier is used here to describe the amount of space provided at a given level of utilisation for every m² that is being used and occupied.

The effect varies at different levels of utilisation. For example, in the 2003-04 EMS data reported median of 27 per cent utilisation, 3.7 m² were being provided for every m² being used. At a low level of utilisation, say 10 per cent, the amount of space provided for every m² in use rises to 10 m². Conversely, at a much higher level of utilisation, say 40 per cent, the amount of space falls to 2.5 m².

Table 4 shows the effect of the inefficiency multiplier at different levels of utilisation.

Table 4: The multiplier: linking utilisation rates and space provision

Utilisation rate %	Total m ² provided for each m ² in use
5	20.0
10	10.0
15	6.7
20	5.0
23	4.3
25	4.0
27*	3.7
30	3.3
35	2.9
40	2.5
45	2.2
50	2.0
55	1.8
60	1.7
70	1.4
80	1.3
90	1.1
100	1.0

* EMS reported sector median (data 2003-04)

Table 4 demonstrates that the relationship between utilisation rates and space provided for every m² being occupied is non-linear. From a

baseline of very low utilisation, an increase of 5 per cent in the utilisation rate has a much greater impact on the amount of space being provided than a similar increase from a much higher starting point. Thus, by moving from 5 per cent to 10 per cent the amount of space provided for every m² in use would reduce by 10 m²; whereas going from, say, 40 per cent to 45 per cent would generate a much smaller reduction of 0.3 m². When utilisation rates are low, even small increases can have a significant impact on the amount of space being provided.

4.5 The multiplier and cost of space

The inefficiency multiplier can also be used to calculate the opportunity cost of different levels of utilisation. Table 5 builds on the information above, to link the amount of space being provided at a given utilisation rate with its cost, based on the average sustainable and total estate provisions as given in the September 2005 version of the SMG model.

At the EMS reported sector median of 27 per cent utilisation, 3.7 m² is being provided for every m² in use. At this rate, the sustainable estate provision for every m² in use is £601 and the total estate provision is £797.

It is clear that very low levels of utilisation are especially costly. It is also apparent that, at low levels, even a relatively small percentage increase in utilisation makes a big difference to cost. For example, going from 5 per cent to 10 per cent would reduce the amount of space provided for each m² in use from 20 m² to 10 m², and the cost for each m² in use halves. Aggressive targeting of very low levels of utilisation can have a substantial impact on cost.

4.6 Estimation of cost of workplaces in use

The effect of the inefficiency multiplier on different types of space can also be assessed. The larger the area per workplace, the higher the cost. General purpose teaching rooms tend to have smaller areas per workplace than specialist spaces. Lecture theatres typically provide one seat per m², so the cost per workplace would be the same as set out in Table 5. In seminar rooms,

where area per workplace is, say 1.85 m², the cost per place rises accordingly as demonstrated in Table 6.

In specialist teaching spaces the total area provided per workplace in use will generally be higher, and so will the cost. An area of 3.5 m² per workplace in laboratories is used in Table 7 below. Low utilisation of large, specialist rooms is especially costly.

4.7 Estimation of cost of sector-wide core teaching space

All the estimations given so far relate to costs per m² or per workplace. A similar estimation can be made in relation to the amount of core teaching space in the sector. In the EMS 2003-04 data, HEIs had some 3.38 million m² of core teaching space, and a median utilisation rate of 27 per cent. Thus, 3.38 million m² were provided for some 911,000 m² in use. Estimation of the effect of lower or higher utilisation rates are illustrated in Table 8.

Table 8 shows how the total amount of space needed varies according to different utilisation rates and what the effect is on sector-wide sustainable and total estate provisions for core teaching space.

4.8 Summary

- Taking a balanced scorecard approach to utilisation demonstrates that it is just one factor affecting the amount and type of space provided.
- In assessing the balance between the costs and benefits of seeking to increase utilisation, it is important to be aware of the opportunity costs of low utilisation.
- The inefficiency multiplier describes the amount of space provided at a given level of utilisation for every m² that is being used and occupied.
- It can be used to calculate the opportunity cost of low utilisation.

Table 5: The inefficiency multiplier: linking utilisation rates, space provision and cost of space

Utilisation rate %	Total m ² provided for each m ² in use	Sustainable estate provision for each m ² in use (£)	Total estate provision for each m ² in use (£)
5	20.0	3,248	4,306
10	10.0	1,624	2,153
15	6.7	1,083	1,435
20	5.0	812	1,077
23	4.3	706	936
25	4.0	650	861
27*	3.7	601	797
30	3.3	541	718
35	2.9	464	615
40	2.5	406	538
45	2.2	361	478
50	2.0	325	431
55	1.8	295	391
60	1.7	271	359
70	1.4	232	308
80	1.3	203	269
90	1.1	180	239
100	1.0	162	215

* EMS reported sector median (data 2003-04)

Table 6: Estimated cost per seminar workplace at different rates of utilisation

Utilisation rate %	Total m ² provided for each m ² in use	Area per workplace (m ²)	Sustainable provision for each workplace in use (£)	Total estate provision for each workplace in use (£)
5	20.0	1.85	6,009	7,966
10	10.0	1.85	3,004	3,983
15	6.7	1.85	2,003	2,655
20	5.0	1.85	1,502	1,992
23	4.3	1.85	1,306	1,732
25	4.0	1.85	1,202	1,593
27*	3.7	1.85	1,113	1,475
30	3.3	1.85	1,001	1,328
35	2.9	1.85	858	1,138
40	2.5	1.85	751	996
45	2.2	1.85	668	885
50	2.0	1.85	601	797
55	1.8	1.85	546	724
60	1.7	1.85	501	664
70	1.4	1.85	429	569
80	1.3	1.85	376	498
90	1.1	1.85	334	443
100	1.0	1.85	300	398

* EMS reported sector median (data 2003-04)

Table 7: Estimated cost per workplace in laboratories at different utilisation rates

Utilisation rate %	Total m ² provided for each m ² in use	Area per workplace (m ²)	Sustainable provision for each workplace in use (£)	Total estate provision for each workplace in use (£)
5	20.0	3.5	11,368	15,071
10	10.0	3.5	5,684	7,536
15	6.7	3.5	3,789	5,024
20	5.0	3.5	2,842	3,768
23	4.3	3.5	2,471	3,276
25	4.0	3.5	2,274	3,014
27*	3.7	3.5	2,105	2,791
30	3.3	3.5	1,895	2,512
35	2.9	3.5	1,624	2,153
40	2.5	3.5	1,421	1,884
45	2.2	3.5	1,263	1,675
50	2.0	3.5	1,137	1,507
55	1.8	3.5	1,033	1,370
60	1.7	3.5	947	1,256
70	1.4	3.5	812	1,077
80	1.3	3.5	711	942
90	1.1	3.5	632	837
100	1.0	3.5	568	754

* EMS reported sector median (data 2003-04)

Table 8: Estimated cost for sector-wide core teaching space

Utilisation rate %	Total m ² provided for each m ² in use	Core teaching space in use	Sustainable estate provision for space in use (£)	Total estate provision for space in use (£)
5	20.0	911,382	2,960,168,736	3,924,410,892
10	10.0	911,382	1,480,084,368	1,962,205,446
15	6.7	911,382	986,722,912	1,308,136,964
20	5.0	911,382	740,042,184	981,102,723
23	4.3	911,382	643,514,943	853,132,803
25	4.0	911,382	592,033,747	784,882,178
27*	3.7	911,382	548,179,396	726,742,758
30	3.3	911,382	493,361,456	654,068,482
35	2.9	911,382	422,881,248	560,630,127
40	2.5	911,382	370,021,092	490,551,362
45	2.2	911,382	328,907,637	436,045,655
50	2.0	911,382	296,016,874	392,441,089
55	1.8	911,382	269,106,249	356,764,627
60	1.7	911,382	246,680,728	327,034,241
70	1.4	911,382	211,440,624	280,315,064
80	1.3	911,382	185,010,546	245,275,681
90	1.1	911,382	164,453,819	218,022,827
100	1.0	911,382	148,008,437	196,220,545

* EMS reported sector median (data 2003-04)

5 Guidelines for a strategic approach to utilisation

These guidelines are not intended to supersede existing good practice advice on space utilisation. They aim to extend that guidance to assist HEIs in taking a strategic approach to utilisation, to analyse performance and to integrate utilisation assessments with other space management measures. They discuss ways of:

- collecting the relevant range of data
- analysing the factors underpinning the findings and evaluating current performance
- calculating the inefficiency multiplier

- reviewing targets
- developing measures to optimise utilisation
- securing top-level support
- integrating with the estate strategy.

5.1 Collecting utilisation data

The essential starting point is to collect data to give a good understanding of current utilisation performance and the reasons for it. Data are needed both on actual utilisation and on predicted use. The following aspects need to be considered.

Type of space. If the assessment is limited to teaching space, that excludes large areas of the estate. It is therefore recommended that utilisation is measured in other spaces as well, such as offices, learning and study areas, and research space.

Workplace area. For thorough analysis, including calculation of the cost associated with the inefficiency multiplier, information is needed on how many study or workplaces there are in each type of space and what the areas are per place.

Coverage. Having comprehensive survey data may be ideal, but for many HEIs this may be impractical. The main objective is to get insight into levels and patterns of use, and therefore data collection need not be comprehensive, but can be done on the basis of a structured sample which is representative of types of space.

Data collection methods for surveys. The key criterion for data collection is accuracy.

Minimising disturbance is also important. Where headcounts are carried out, data may be recorded on paper or on hand-held computers. At the point of survey, there is little difference in time entailed. The biggest difference will stem from whether capacity is recorded on the basis of headcounts or estimates. Headcounts take longer, but are the preferred method in EMS, and estimates give less reliable data. Hand-held computers can reduce the time for inputting data by directly downloading the data into the analysis software, but there is an initial capital cost if large surveys are carried out on a regular basis.

Some HEIs are exploring other methods of data collection. Some use swipe card information to find out when rooms are used, but this does not provide reliable data about how many people are using them. Where webcams are installed in rooms, they can be a source of information on utilisation. That may cut down on the time needed to collect data, although the information obtained would still need to be entered into the analysis software. An alternative method of collecting data is for staff to make a record of use each hour (in effect a register).

Frequency of collection. The more often data are collected the better information will be on how space is being used. Each HEI will balance costs and benefits, but one week's data per year should be the minimum, and preferably at least two weeks to be reasonably representative.

The data may either relate to consecutive days, for example from Monday to Friday in a single week, or be collected on a rolling basis. If the rolling collection approach is taken, an HEI would need to make sure that it was equivalent to at least a week covering all hours.

Data on predicted use. Data on predicted use are also needed to enable a comparison to be made between how the space was planned to be used and actual use, and to assess the scale of the difference between the two.

5.2 Analysis and evaluation

Although the overall utilisation rate will give a broad indication of intensity of use, neither the headline rate nor the raw data will in themselves be enough to effect institutional change. To facilitate such change, HEIs need to be able to analyse and interrogate the data collected to see patterns of use across room types, capacities and at different times. For example, are there peaks of demand which are driving the overall supply of certain types of space? The range of analysis is likely to include:

- overall surveyed rates (frequency, occupancy and utilisation)
- calculations by day, hour, campus, building, room type, user and room capacity
- identification of rooms above or below specified frequency, occupancy or utilisation levels.

The actual patterns of use can then be compared with how the space was planned or timetabled to be used, to allow calculations of:

- scheduled use as a proportion of total time available
- observed use compared with timetabled use
- observed use which is not timetabled
- time not used and not timetabled.

This information will allow HEIs to plan scenarios to assess implications of withdrawing some rooms or buildings from use or of providing replacement/additional space.

The greater the size and complexity of assessments, the more likely it is that space utilisation software would be helpful; but whatever method is chosen, it is important that the data can be analysed interactively and easily. Without this level of analysis, many of the reasons behind low or very uneven utilisation are likely to remain hidden.

5.3 Calculating the inefficiency multiplier

The next step is to calculate the effect of the inefficiency multiplier for different types of space using the method set out in section 4.

Calculations may be done at the level of individual buildings, sites or institution-wide.

If the inefficiency multiplier is linked to the cost of space per m² or per workplace, this can help HEIs to gauge the opportunity cost of current levels of utilisation. It can also focus attention on where the greatest opportunity costs lie. This will be where utilisation rates are lowest, area per workplace is largest and the cost of space is highest.

The inefficiency multiplier approach shown in Tables 4-8 (section 4) can be populated with an HEI's own data on costs and workplace areas.

The SMP report the cost of space and the SMG model can be used to inform the sustainable estate provision and the total estate provision for the cost per m² of space in use.

It is also possible to use the inefficiency multiplier at this stage to consider what the effect would be of achieving higher or lower utilisation rates and having smaller or larger workplaces.

5.4 Reviewing targets

Many HEIs already use utilisation as a performance indicator and have their own targets for increasing utilisation rates.

Rather than setting targets in isolation, it is often best to do this in the context of what predicted frequency and occupancy rates are considered to

be feasible, achievable and desirable for different types of space. As such, they will need to balance preferred methods of learning, teaching and working, with encouraging efficiency in space use. One single target is unlikely to be appropriate to all types of space.

The space need indicator in the SMP report 'Review of space norms' can be used to help to define predicted rates and, if desired, to model the effect of different assumptions. The selected rates will then need to be moderated to some degree, to allow for the difference between what is predicted and what is found to be happening on the ground. Wherever possible, the gap between the two should be minimised, but occupancy rates in particular are likely to be lower than planned.

As an example, an HEI might conclude that the predicted utilisation of seminar rooms will be in the order of 60 per cent, based on scheduled frequency of use at 80 per cent over the core week and planned occupancy of 75 per cent. Even with efforts to keep actual use as close to predicted use as possible, there is likely to be some fall off between the two, say 7 per cent in frequency and 20 per cent in occupancy. This would result in a target of observed utilisation in seminar rooms of some 45 per cent. The same method can be used to generate targets for other types of space.

Actual utilisation can then be compared and monitored against target utilisation.

5.5 Developing measures to optimise utilisation

Measures to optimise utilisation may cover:

- matching timetabled and surveyed use
- smoothing patterns of use
- maximising the flexibility of room uses
- matching supply and demand for types of rooms
- linking to the institution's strategic objectives.

These are discussed in more detail below.

Matching timetabled and surveyed use. Measures to narrow the gap between timetabled and observed frequency of use include: tracking both timetabled and observed use; providing the results for discussion and analysis with faculties/departments; having penalties and incentives for faculties/departments to encourage improvements. For example, there could be fines for departments where there is a significant difference between scheduled and observed frequency of use.

Smoothing patterns of use. Measures can include using timetabling software to explore scenarios to smooth demand; differential charging for different times of the day or week aimed at addressing overcrowding at peak times and under-use at others. Premium rates are charged at peak times with discounts for the least popular.

Maximising the flexibility of room uses. Some rooms will only ever be suitable for a specific use, but if rooms are designed for flexibility where possible, they can be used by a wider range of users.

Matching supply and demand for types of rooms. Understanding real demand will give information on how far there is a mismatch between what people need and what space is available. Real demand can be identified by allocating rooms based on type of activity, technological and equipment requirements, and staff and student numbers rather than on user preference or precedent. Comparing the basis of the original requests with what was allocated will highlight surpluses and shortages. Demand may also be driven by the need for particular audio-visual facilities. Where provision can be standardised, this will make it easier to match group and room size.

Linking with strategic objectives. The analysis provides core data for assessing overall patterns of space demand and a basis for comparison with the amount and type of space available. Where HEIs wish to increase utilisation and do not have plans for major increases in activity, the

results of the analysis need to be linked at a strategic level to plans for rationalisation or space reduction, and to institution-wide space management tools, such as space charging and extending central timetabling.

5.6 Top-level support

Top-level support is a critical success factor. It is the responsibility of the space management champion to ensure:

- space utilisation information, planned and actual, is reported to the senior management team at least once a year
- space utilisation objectives and targets are included in, and form part of, the space management plan and the estate strategy
- utilisation targets are agreed by the senior management team
- measures to improve utilisation have direct support from the senior management team.

5.7 Integration with the estate strategy

The effect of the inefficiency multiplier demonstrates that space utilisation is a strategic factor. For levels of utilisation to rise significantly there needs to be an increase in activity and/or a decrease in space. These are core issues for the estate strategy. It is recommended that strategy formulation includes a cost benefit analysis of current performance, highlights key areas for action and sets out the key steps for delivering targets.

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Annex 1: Review of earlier utilisation guidance

Measuring space utilisation and aiming for improvements are not new topics in HE. This annex provides summary information on the main milestones in guidance both in relation to observed utilisation and the planned use of space.

Space norms

Space norms were originally based on assumptions about target frequency and occupancy rates. The PCFC norms used a planning frequency rate of 80 per cent and a planning occupancy rate of 80 per cent to generate a target utilisation rate of 64 per cent. The UGC norms used varying frequency and occupancy rates for different types of activities.

DES Design Notes

Design Note 12 published in 1974 by the Department of Education and Science noted that studies of utilisation date back at least as far as 1916 when the University of Iowa reported that it could only manage 30-50 per cent utilisation (although it is not clear if this was planned or observed). This note looked at ways of improving utilisation. It followed in the wake of concern about under-use of university space in Britain in the 1960s.

'The utilisation of teaching space in many universities, polytechnics and other institutions of higher education is lower than users either expect or would wish for.' (1974)

The Design Note concluded:

'Utilisation was... but a crude outward expression of these problems, and the measurement of utilisation and the mere setting of 'targets' would do little to help universities and polytechnics to achieve more effective use of space.'

It recommended that improvements could be achieved in part through management and in part through design. Management measures included placing as much accommodation in the common pool as possible for timetabling; classifying rooms by their size and facilities so that all potential

uses are revealed; examining timetable practice; and spreading scheduled activities as far as possible throughout the day, week, term and year to avoid unnecessary peaking.

The recommended methods of delivering improvements sound very familiar more than 30 years on.

National Audit Office 1996

The National Audit Office (NAO) space management study followed from the recognition by the Public Accounts Committee in 1995 that institutions needed to improve the utilisation of their existing space. The NAO commissioned utilisation surveys at three institutions and found the average utilisation rate was in the range of 19 per cent to 22 per cent.

In its report, the NAO recommended that institutions should consider:

- commissioning regular space utilisation surveys
- setting targets for improving utilisation rates as a whole in the light of the survey results, particularly those illustrating the mismatch between group size demand and room size supply
- agree departmental space utilisation targets which take account of the teaching delivery patterns of particular departments and which make allowance for the nature of the accommodation available to them, including bad fit
- analysing room use data, including that of information technology and other specialist rooms, to assess the scope for remodelling or changing the function of specific rooms.

The report noted:

'the National Audit Office's findings suggest that a figure of 50 per cent (for instance around 70 per cent frequency and 70 per cent occupancy) may prove to be a challenging target'.

Detailed advice on how to do surveys is contained in the NAO's 'Space Management in Higher Education: A Good Practice Guide'. This good practice guide is still the main source of advice followed by HEIs for utilisation surveys, and is the foundation of the definitions of utilisation used in the EMS returns.

Questions raised by the Public Accounts Committee following the NAO study led to a further report in March 1997. This concluded that the level of utilisation was unacceptably low and noted that a target of 30 per cent utilisation across Wales should be achievable over the next four years, with a longer-term goal of 40 per cent signalled. The report recommended that the Funding Council in Wales should encourage institutions to set themselves challenging targets to improve utilisation of space, and that it should monitor performance against those targets.

Around the same time, the Dearing Report noted that if utilisation could be raised to 35 per cent, which the Association of University Directors of Estates considered efficient, this would support a significant increase in numbers broadly within the present approach to the academic year.

HEFCW guidance 1999

The HEFCW guidance to assist the improved use of teaching space looked at matching demand and supply of teaching space by using target utilisation levels to establish space need using the following formula:

$$\frac{\text{Annual on-site daytime group hours}}{\text{Annual available room hours}} \times \frac{100}{\text{Target room frequency}}$$

A key variable in the formula is the target room frequency. The guidance noted that the target frequency to achieve a space utilisation level of 30 per cent is 55 per cent (assuming approximately the same level of seat occupancy). A later example uses 60 per cent to generate a target utilisation of 36 per cent. It recommends that the target space efficiency level is based on best practice within the institution or the performance of the most efficient comparator institutions within the sector. Space efficiency

levels associated with general purpose accommodation should be significantly higher than for specialist spaces, to reflect the fact that lecture theatres and classrooms can be used by a wider number of courses.

HEFCE 00/04 Estate strategies: a guide to good practice

The guide advises that it is beneficial to note existing space practices and utilisation levels, with aims and future requirements. The sample estate strategy given grades utilisation as good, fair or poor as follows:

- good is equal to or greater than a 35 per cent utilisation rate
- fair is a 25 per cent to 35 per cent utilisation rate
- poor is equal to or less than a 25 per cent utilisation rate.

ELWa Estate Management Manual 2001

The manual recommends utilisation surveys as part of a space management strategy. It advises institutions to set their own appropriate targets for utilisation:

'Each institution must set their own target rate in relation to their individual problems of bad fit. The target rate should improve each year.'

ELWa Good Practice Guide 2002

One of the recommendations in this guide was that HEIs should carry out full space utilisation surveys. These should cover all teaching space at a minimum, with consideration given to including all space.

It did not specify targets for utilisation, but its advice on how to calculate a space need profile identified target frequency of use as a key variable. The example given in the report uses a target frequency of 70 per cent for general teaching and 80 per cent for IT uses.

University of Newcastle upon Tyne Space

Management Report 2002

This report set out space utilisation principles for adoption by HEIs.

Principle: Improvements in the efficiency and effectiveness of space cannot be managed without compelling analysis of utilisation, disseminated to all levels of the institution.

It recommended that surveys should be carried out each year and institutions should identify the uses that constitute significant proportions of the estate in order to decide what types of space to survey. Frequency was identified as the most important factor.

Principle: Utilisation survey data should be reviewed annually in the light of frequency targets and action should be taken at senior management level to adjust the number of teaching rooms to progress towards the target frequency rate.

'Targets should relate to an assessment of the total number of teaching rooms the institution seeks to operate, as part of its total estate size. ...The preferred number of rooms should be identified by relating it to affordable operating cost, allowing for investment to rectify depreciation.'

Estate Management Statistics (EMS)

Although the EMS project provides HEIs with data rather than guidance, the annual report for 2004 comments that there are some key questions relating to space, condition and the use of data contained in the EMS that HEIs should ask themselves, including: is space utilisation being maximised?

