

UK HIGHER EDUCATION SPACE MANAGEMENT PROJECT

REVIEW OF PRACTICE REPORT



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Executive summary

Report structure

1. This study is one of a series of projects carried out as part of the UK Space Management Project (SMP) under the direction of the UK HE Space Management Group (SMG). The executive summary outlines why this research was undertaken, what was learned and how we can use these insights to ensure that the SMP delivers real value to the UK higher education sector. The study considers five key factors for successful space management, and findings on each are summarised in this section.

2. The body of the report expands on the research, showing questions asked, results and analysis. Throughout are opinions, comments and case studies provided by participants.

Taking stock

3. This study gives an overview of how UK higher education institutions (HEIs) currently manage their space. It is based on responses from 140 HEIs to the first sector-wide survey of space management practice in the UK. The SMP aims to build on existing best practice and previous work rather than trying to reinvent the wheel, and therefore incorporates data from other sources in its results, chiefly the annual Estate Management Statistics data produced by IPD and GVA Grimley. The survey results have given the SMP a sound basis for assessing whether its outputs are fully aligned with the needs of the HE sector.

The rationale

4. The research set out to see to what extent published good practice recommendations on managing space are being followed. Published recommendations considered were the National Audit Office's (NAO's) report, 'The Management of Space in Higher Education Institutions in Wales' and the accompanying Good Practice Guide (1996), Education and Learning Wales' (ELWa's) Space Management Report (2002) and the Newcastle Guidance on Space Management (2002). These sources stress that key factors for successful space management are:

- leadership
- objectives
- information
- communication
- practical tools.

5. This study also assessed whether use of practical space management tools – specifically space charging, space standards and central timetabling – is correlated with improved space performance.

Findings

6. Some core components from published good practice are in place among most institutions. Among the respondents:

- 70 per cent of HEIs have a 'space management champion' – an individual at a senior level acting as an advocate for space management
- just over half (54 per cent) have space management objectives or targets, and 69 per cent use performance indicators to manage space
- over 60 per cent state that they have the space data needed for space management in terms of a computerised database, room sizes, capacities, functions, identification by user and number of teaching workplaces
- almost 80 per cent of HEI respondents collect data on space utilisation
- 29 per cent of HEIs have space charging
- 86 per cent have some computerised centralised timetabling with 12 per cent timetabling all their teaching space.

7. There are also some gaps and perceived constraints to effective space management:

- specific and measurable targets are rarely found
- since the management information needed is often dispersed within the institution, it is difficult to get an overview and the necessary detail for effective space management
- there remain gaps in data, particularly about room capacities, function, identification by user, workplaces and functional suitability
- data collected, from utilisation surveys for example, are not always integrated into space management policy or decisions
- the absence of sector-wide and up-to-date space standards or norms is repeatedly highlighted as a problem
- communication of space management guidelines, policies and so on is sporadic, and users are not often involved in space management policy
- cultural issues concerning ownership of space, resistance to change and lack of trust remain barriers to implementing change.

What does this mean for space management and the SMP?

8. In phase one of the SMP some of the weaknesses began to be addressed.

- Two reports are to be published on the cost of the estate and benchmarking the size of the estate. There is also an interactive tool on the SMG web-site to enable HEIs to calculate the total annualised cost of the estate and to benchmark its size.
- Cultural issues, regarding space management in HEIs are being addressed by the SMP through a proactive communications approach that is centred on engaging the key decision-makers early on, soliciting their feedback, building understanding, and ultimately gaining their buy-in by providing

support for adopting and implementing the recommendations of the SMP. The SMP communications plan includes provision of communications support to the sector in its efforts to adopt its recommendations.

Key success factors

9. Adoption of the five key success factors listed in paragraph 4 varies between institutions. Here we outline the main findings for each factor.

Leadership

10. A high proportion of institutions responding to the survey (70 per cent) have a space management champion, often at very senior level, and around half have a space management committee or group and a space management strategy or policy. However, some champions are more active than others. The responses suggest that the prominence of space management issues is significantly affected by the commitment of key individuals, and that therefore its prominence may diminish or increase with changes in senior staff.

11. With such a high proportion of space management champions cited by respondents, high scores on the other key success factors might be expected. We feel that the role of space management champion needs better definition.

Objectives

12. Just over half of the respondents (54 per cent) say that they have space management objectives or targets, and 69 per cent use performance indicators to manage space. Space utilisation of general purpose space is the most common objective. Few of the objectives, targets and indicators given by HEIs are specific and measurable. The link between space management and academic and financial planning is patchy and inconsistent.

13. For space management to be effective, objectives need to be linked to overall institutional resource planning and management, and be better quantified. They must also be specific, and be relevant not only to general purpose teaching space but to specialist space, research, office and support space.

Information

14. Over 60 per cent of institutions state that they have the space data needed for space management in terms of a computerised database, room sizes, capacities, functions, identification by user and number of teaching workplaces. But gaps in the data remain:

- 36 per cent have some or no data on room sizes by capacity
- 16 per cent have some or no data on room function
- 18 per cent have some or no data on room user
- 30 per cent have some or no data on the number of teaching workplaces
- there is substantially less information about functional suitability, with 48 per cent having no functional suitability data and 29 per cent having some.

15. Institutions without space data will find it difficult to manage space to maximum effect, because they will not know the baseline from which they are operating in terms of what the space is used for, what its capacity is, who is using it and how intensively it is being used. The lack of functional suitability data makes it difficult, both at individual institutional level and at the sector level, to assess the impact of space management tools on the quality of space. Full, up-to-date and accurate data are needed to underpin space management policy and practice.

16. Ease of access for space managers to student record data varies between HEIs, but does not appear to be routinely available or used by HEIs in managing space.

17. Almost 80 per cent of HEI respondents collect data on space utilisation. Most of these institutions carry out surveys regularly. General purpose teaching space is the most common type of space surveyed, but this may be limited to pooled rooms. General purpose teaching space is a relatively small proportion of the total estate. It was found to comprise some 59 per cent of core teaching in the EMS 2004 institutional report and 15 per cent of total net internal non-residential area.

18. Specialist teaching space is the next most common category of space surveyed, with just over half of all respondents reporting that they survey at least some specialist teaching space. Other types of space are surveyed much less frequently, for example teaching/research offices are surveyed by 16 per cent of respondents and support offices by 11 per cent. Office space comprises some 21 per cent of total net internal non-residential area as reported in the 2004 EMS institutional report.

19. Most HEIs report that space utilisation results are used to manage and allocate space or feed into the timetabling system. However, there is no common or systematic method of linking the data collected to the amount and type of space needed for HE activities. Without this link, we feel that the information collected has limited use in planning the estate.

Communication

20. Space management guidelines are not routinely provided to users, and users are only sometimes involved in developing space management policy. Participants in the telephone survey identified cultural issues about space ownership and occupation as being one of the main barriers to more efficient space use. They also identified transparency of the space management process and leading by example as being among the main ways of getting buy-in from users.

21. These results are a cause for concern given the high percentage of HEIs that have space management champions. It would suggest that space management champions need more support in communicating with their local audiences.

Practical tools

22. The review of space management tools focused on space charging, space standards and central timetabling.

Space charging

23. Statistical analysis has found a correlation between space charging and the size of the HE estate. On average, and allowing for a range of external drivers affecting institutional size, HEIs that charge for space have 12 per cent less net non-residential space than those that do not charge for space. The findings support the NAO's conclusions and recommendations on the role of space charging in promoting efficient use of space.

24. There is wide variation in space charges operated by HEIs. The median flat rate is £126 per m². Most respondents include operating costs and maintenance costs in the charge. Fewer include depreciation or the cost of capital.

25. As the parallel SMP study on the cost of the HE estate concluded, institutions would need to include operating costs, maintenance and depreciation if they were to recover the cost needed to have a sustainable estate, that is, one that is fit for purpose, in good condition and kept that way. HEIs would also need to include the opportunity cost of capital (the financial opportunities forgone by investing in the estate) if they were to have a space charge that recovered the total estate cost. Similar issues are being considered as part of work done by HEIs on the Transparent Approach to Costing (TRAC) and it would be beneficial to have greater convergence than at present between space charges levied by institutions and the cost of providing and maintaining a fit-for-purpose estate.

Space standards

26. The survey provided examples of different practice in the application of space standards between HEIs but it did not yield a large enough sample to test – across the sector – whether the use of more stringent space standards (that is a smaller area for a given activity) is correlated with less space overall.

27. The survey found that some HEIs have developed their own standards or norms, and that 45 per cent of respondents continue to use University Grants Committee (UGC) or Polytechnics and Colleges Funding Council (PCFC) space norms and/or space weightings. Some HEIs have made their own modifications. None of the norms has been updated since 1990, and the space standards underpinning them date from before that. Weightings only provide relativities in terms of space needs and not the actual area required for an activity.

28. Space standards are a key variable affecting space need assessments, and the study highlights that up-to-date and easily accessible information on space standards for HE activities is a missing link in the range of space management tools available to HEIs. This is an important issue to be addressed in phase two of the project.

Central timetabling

29. Statistical analysis of HEIs that use central timetabling found that the size of the estate is not linked to having central timetabling per se, but to how much space is included in the system. Where HEIs timetable all their teaching space (both general purpose and specialist), there is a clear correlation with space performance. On average, HEIs with 100 per cent of teaching space centrally timetabled have 17 per cent less space than those that do not. The findings support the NAO's recommendation that there is scope for institutions to achieve significant improvements in the efficiency of space use by increasing central control of teaching accommodation.

30. Institutions participating in the case studies highlighted the following key factors for a successful timetabling system that makes efficient use of space:

- top level support
- expertise and effective resourcing of the timetabling unit
- a clear policy for staff
- access to core student record data
- a detailed knowledge of the HEI's rooms and facilities.

Moving forward

31. Phase two of the SMP will address constraints and gaps identified in the survey. At the end of this phase, we aim to provide a complete set of guidelines and support tools that can be incorporated into space planning and management, as follows:

- a. **Assessing the impact of design on space efficiency.** Research is under way to determine how design can maximise efficient and effective use of space. It is assessing a series of projects in terms of their versatility, cost in use, image and attractiveness, and spatial plan efficiency. It is also looking at how behavioural and cultural issues associated with innovative design can influence space performance.
- b. **Reviewing other space management methods.** Phase one concentrated on the effect of space charging, space standards and centralised timetabling. The focus of this research was on whether different methods could make a useful contribution. Other methods being investigated include the model developed by the Learning and Skills Council and examples from international HE experience.
- c. **Reviewing good practice in utilisation surveys.** This will build on the results of the survey data to integrate utilisation data with policy and practice in space planning and management. It will also explore how utilisation levels can be measured and planned in space other than general purpose teaching accommodation, by looking at, for example, specialist space and offices.
- d. **Considering the feasibility of updated space norms.** Space standards and norms were highlighted as a key issue by many survey respondents. Views were mixed on their appropriateness, but for a substantial number

of HEIs the lack of a common up-to-date source of sector-wide guidance left many individual institutions developing their own systems. This research area will consider the feasibility and desirability of providing updated norms for the sector.

- e. **Identifying learning and teaching impacts on space use.** Change is an integral part of life for HEIs. The project will look at how changes in pedagogy and other HE activities are likely to have an impact on space needs, and how space management may need to adapt and respond.
- f. **Case studies.** Research here will give detailed examples of HEIs' space management policies and practices and will concentrate on both the strategic and practical aspects of implementation.

Introduction

Scope of the study

32. The purpose of this study was to review HEIs' space management practices and assess whether there is a correlation between use of space management tools and improved space performance. The brief focused on the role of three space management tools in particular:

- space charging
- space standards
- central timetabling.

33. This study is one of a series of research projects carried out as part of the UK Space Management Project (SMP) under the direction of the UK HE Space Management Group (SMG). The SMG is supported by the four UK funding bodies for higher education: HEFCE, SHEFC, HEFCW and DEL.

The Space Management Project

Phase one

- Reviewing existing space management practice
- Modelling the size of the HE estate
- Assessing the total cost of the HE estate

Phase two

- Assessing the impact of design on space efficiency
- Reviewing other space management methods
- Reviewing good practice in utilisation surveys
- Considering the feasibility of updated space norms
- Identifying learning and teaching impacts on space use
- Case studies

Significance of space management

34. Property costs are usually the second highest cost after salaries for organisations, both in HE and other sectors. The estate is a core component of HE infrastructure. The cost of providing and maintaining a sustainable estate is high. It needs to cover operating costs, maintenance, and provision for periodic upgrading and eventual replacement.

35. The separate report on 'The cost of space' (provided in phase one of the SMP) has estimated that on average the sustainable estate provision using 2002-03 EMS data is £147.40 per m² for the non-residential estate. When allowance is made for the opportunity cost of capital tied up in the estate, the total cost is estimated at £192.50 per m². At this level of cost, space needs to be used effectively. Space management is a key factor in delivering an estate of the appropriate size and quality for an HEI's activities.

Existing studies and recommendations

36. Space management is not a new topic. There has been a series of reports and studies both in the UK and in other countries. A selection of these is listed in Annex A, and here we describe three key studies from the UK to give an overview of the issues and to set the framework for the evaluation of current practice in HEIs.

37. All three reports stress that there are critical factors for effective space management:

- leadership
- objectives
- information
- communication
- practical tools.

National Audit Office study

38. Work done by the NAO in the mid-1990s raised the profile of space management across the sector.

39. The NAO looked at space management in the wake of recognition by the Government's Public Accounts Committee of the need for institutions to maximise the potential of their existing space. In 1996, the NAO published a report, 'The Management of Space in Higher Education Institutions in Wales', and an accompanying good practice guide on space management. Given the scale of institutional expenditure on the estate, the NAO stated that the provision, servicing and maintenance of space and the way in which an institution manages its space are key factors in the efficient application of the resources at its disposal.

'Effective space management can reduce the overall running costs of the estate, and ensure more intensive use of existing accommodation, so reducing the need to provide additional space. It can also facilitate a better match between the space available and the institution's requirements.' (NAO 1996)

40. The NAO recommended a framework for good practice in space management combining structure, information and techniques.

NAO framework for good practice in space management

Space management structure:

- a space management committee led by a member of the senior management team and including academic representation
- clearly defined objectives about what space management measures are designed to achieve
- clear responsibilities for implementing change and managing space
- arrangements for the effective communication of space management policies to users
- arrangements for feedback from users
- a review of outcomes.

Information:

An up-to-date and comprehensive database of information about the estate and the extent to which it is used (including space utilisation surveys).

Space management techniques:

An integrated package of space management measures which offer incentives and impose penalties in order to achieve the optimum allocation and distribution of space.

Specifically:

- central control and computerised timetabling
- space charging
- space planning and remodelling.

41. The NAO's view was that all institutions could benefit from applying this broad framework, while recognising that individual institutions would need to decide what particular strategies and techniques were appropriate for their own circumstances.

ELWa Good Practice Guide

42. ELWa published a good practice guide on space management in 2002.

Space Management – A Good Practice Guide (ELWa 2002): Key means of improvement

‘Develop a clear vision of where the institution wants to be and have effective leadership to achieve this. This requires someone to take up the challenge and lead on it. They also need to have the complete picture, and need to be supported by a Space Management Committee or equivalent – which has the appropriate resource, support and prestige.

Proactive management of space by all needs to happen. This requires the academic community to understand fully the benefits to be gained from effective space management.

Sort out databases, communication and committee structures.

Identify real current and future space needs on a proactive rather than a reactive basis. This needs to be on a bottom-up basis – i.e. derived from what each course/student does.’

Newcastle report

43. In 2002, the University of Newcastle upon Tyne reported its findings on space management in higher education. The project was supported by HEFCE and aimed to produce space management guidelines for the HE sector, which would raise the status of space management on institutional agendas. The guidelines incorporated a series of principles, set out below.

Newcastle space management principles

- The strategic size of the estate must be identified. This is the estate size which the institution’s income will be able to support allowing for running costs, maintenance and a programme of updating the estate to keep it fit for purpose.
- Effectiveness of space is as important as efficiency. New standards for space use and working practices should be introduced in consultation with users, on the basis of evidence rather than speculation as to the balance between efficiency and effectiveness.
- The larger the proportion of teaching rooms subject to pooling and central timetabling, the greater the resulting efficiencies that can result from the system.
- Significant efficiencies will only result if the total teaching room capacity is related to the total need for taught student hours. Efficiency will not result where there is substantial spare capacity.

- Improvements in the efficiency and effectiveness of space cannot be managed without compelling analysis of its utilisation, disseminated to all levels of the institution.
- Utilisation rates 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.
- Space standards should be tailored to the mission of an individual institution, reflecting its operating style, and projecting its chosen image to all stakeholders.
- Space standards should encourage progress towards efficiency goals based on an institution's strategic target estate size. They are, however, only one of several available space management tools, not a prerequisite for efficient and effective space use.
- Space charging should create an incentive to users to employ space efficiently by clearly showing them the cost of their space and charging them for it.
- Charging will not drive efficiency if the charge per m² is so low that it is easily affordable. The system must therefore be calibrated to achieve the target estate size.
- Performance indicators measuring ratios of space:student, space:staff and financial data:space should be used to compare the space use of different departments, faculties or research groups to their performances and to each other.
- Universities should rethink their use of space in the light of new working practices.
- Space management should make all university staff aware that space is an expensive resource. The benefits from changes in space management policy and processes can be maximised by a programme of change management designed to engage staff commitment to efficient and effective space use.

Study method

44. The research in this study set out to give an overview of space management practices across the sector, to see how far published good practice recommendations are already in place, and to find out if there is evidence that using space management tools is linked to improved space performance.
45. The study included a review of existing advice on space management, surveys of current practice, and statistical analysis of the effect of space management tools.
46. The estate management statistics (EMS) collected annually by the UK Funding Councils were the main source of data on the size and characteristics of the HE estate.
47. There were two surveys. Questions were structured to avoid duplication of data collected through the EMS project.
- a. A questionnaire asking for information about current space management practice was sent by e-mail to 166 institutions in December 2003. Responses were received between December 2003 and April 2004. There were 140 returns – a response rate of 84 per cent.
 - b. In addition, 22 HEIs took part in a telephone survey in December 2003 and January 2004. Institutions participating in the telephone survey comprised 15 universities and seven colleges, including three small specialist institutions. Sixteen institutions were in England, one in Northern Ireland, three in Scotland and two in Wales. The telephone survey gave the opportunity to explore space management issues in more depth, particularly issues relating to barriers to success, incentives for effective space management and objectives for the future.
48. The combined survey results provide a sector-wide source of information on current space management practice across the UK. Follow-up discussions took place to find examples of good practice and to provide case studies for inclusion in the report.
49. Part of the brief for the study was to find out if there is a correlation between use of space management tools (space charging, space standards and centralised computerised timetabling) and improved space performance. This assessment was made as part of the analysis of the drivers that determine the size of the HE estate. The model used was:

$$\text{Size of the estate}_j = f(Z_i, V_i)$$

Where ‘Size of the estate_j’ is the size of a range of space categories, ‘Z_i’ are the external drivers, and ‘V_i’ are the space management variables.

50. This model was estimated cross-sectionally, by ordinary least squares.
51. The model included an assessment of a wide range of external drivers. A full discussion of these and their effect on estate size is contained in the companion SMP report, ‘Drivers of the size of the higher education estate’. This enabled the effect of the space management variables to be assessed across institutions, having first controlled for the range of drivers, such as income, number and type of students, location and age of the estate.

Current space management practice: survey results

52. The results summarised in this section are from the e-mail and telephone surveys. Where comments were made in the telephone survey, they are identified as such. All other results are from the e-mail survey.

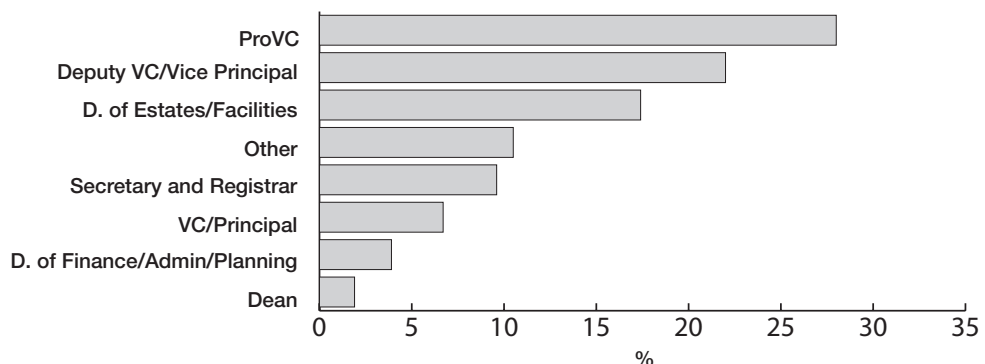
Leadership

Senior management commitment

53. Space issues appear to have high visibility for senior management within HEIs, with 70 per cent of respondents saying that they have a space management champion at top institutional level.

54. Fifty per cent of institutions have a space management champion at the level of pro-vice chancellor or deputy vice chancellor/principal (see Figure 1). Directors of estates/facilities make up the next main group, with just over 17 per cent. In just under 7 per cent of the institutions the vice-chancellor/principal is identified as the space management champion.

Figure 1 What position does the space management champion hold?



55. Forty-nine per cent of institutions have a space management committee or group. In just over half of these (55 per cent), the committee or group is chaired by the space management champion.

56. In the telephone survey, institutions were asked if there was top-level support for space management. Some respondents said yes unequivocally, with one noting that it was raised as a question against everything. Another noted that there used to be support, but it no longer existed.

57. In 38 per cent of the responses the most senior manager responsible for space management is the director of estates or facilities management. The other most frequently cited positions are secretary/registrar (10 per cent), vice-principal (10 per cent), space manager (9 per cent) and pro-vice chancellor (8 per cent).

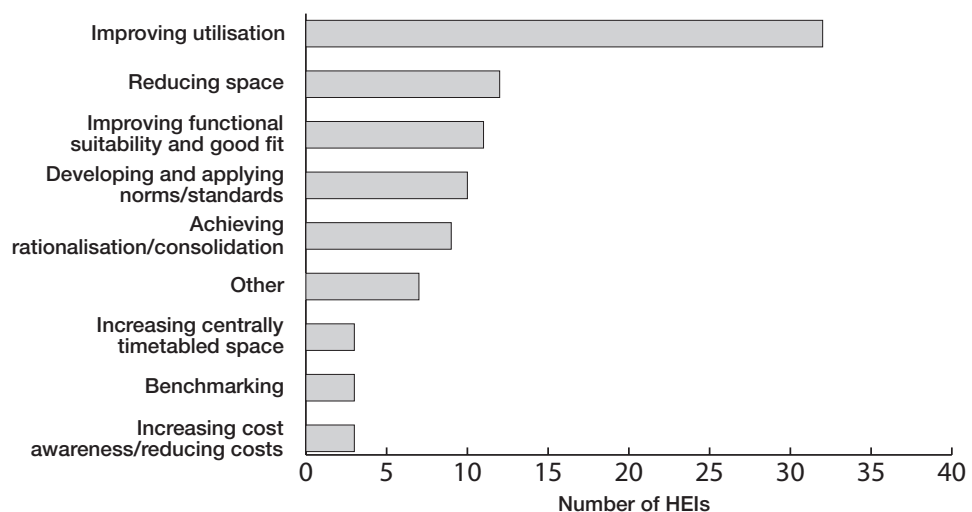
58. Around half (49 per cent) of respondents have a space management policy or strategy. Several institutions that do not have a policy are in the process of developing one or reviewing the need for one.

59. The telephone survey explored whether space management was linked with academic and financial planning. Responses were mixed. They ranged from comments that there were no links or that they were vague or tenuous, through to statements that the link was fundamental. In other cases it was apparent that the link had been created by a specific event, such as the introduction of devolved budgets at one institution and, in another, by the need to cut costs and vacate space.

Objectives

60. Fifty-four per cent of respondents have objectives and targets. A summary of the main subjects of these is shown in the chart below.

Figure 2 **Range of objectives and targets**



61. Institutions' objectives and targets often cover more than one subject:

'The institution's overall objective is to ensure we provide well-used high quality accommodation and that poorly used space is identified and either reconfigured to accommodate areas of growth or disposed of altogether. The intention is to concentrate finite financial resources in the upkeep and development of as small a physical estate as possible without compromising academic activities.'

62. **Improving space utilisation** is the most frequently mentioned subject for objectives and targets. Very few specific targets were given.

63. The responses which focused on **reducing space** were more specific. They included:

- 'reduce space by 11,000 m²'
- 'reduce overall size of the estate by 15 per cent based on 2001 figures'
- 'space per full-time equivalent (FTE) to reduce from 11.8 m² per FTE to 9 m² by 2007-08'
- 'target of attempting to reduce overall area by 10 per cent'.

64. Examples of other objectives and targets are:

Rationalisation/consolidation

'The main objective is to consolidate all teaching activities on one site. This has been partially achieved over the past three years from eight sites to two with no major effect on the student experience and without extending the existing buildings.'

'Remodelling of existing spaces has allowed increased efficiency in the use of space.'

'To ensure the most effective use of space. To ensure laboratories and related services are co-located. Wherever possible to ensure research units are located in co-terminus space.'

'[To] optimise the use of space on the remaining three campuses, having rationalised from five during the 2001-02 academic session.'

Improving functional suitability and good fit

'[To] rationalise the use of space to reduce poorly configured space, bad fit and percentage balance.'

'Building in increased flexibility in the design of buildings.'

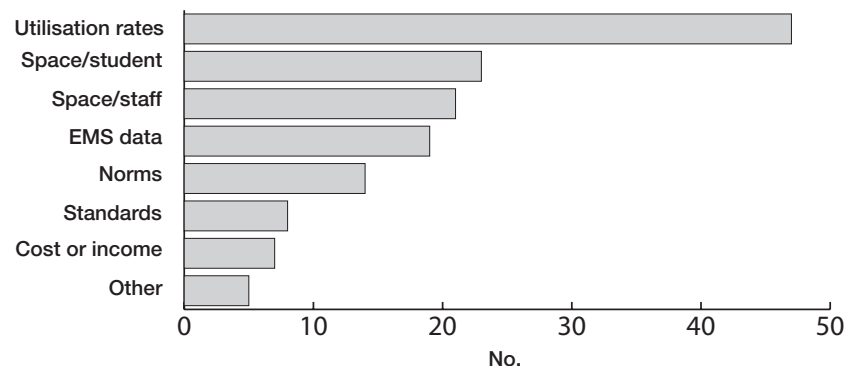
Norms and standards

'Targets are set for departments/centres to be within +/- 5 per cent of the space to which they are entitled based on the university's own norms, which are reviewed annually and adjusted accordingly.'

'Developing space norms for office space.'

65. When institutions were asked if they use performance indicators to manage space, 69 per cent said yes. The range of indicators is shown in Figure 3. Some institutions mentioned more than one subject.

Figure 3 **Range of indicators**



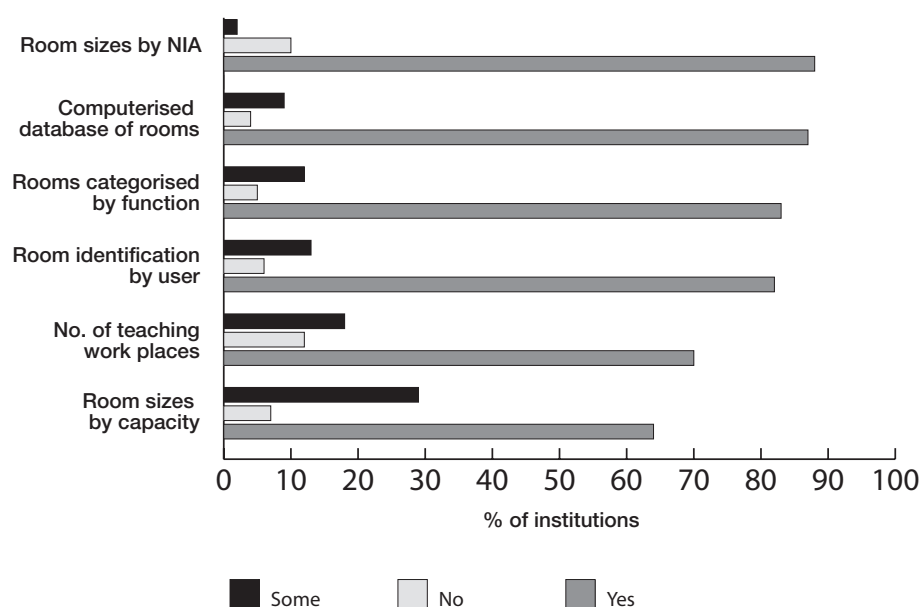
66. Utilisation rates are the most frequently cited indicator. Analysis of responses indicates that the focus is on the utilisation of general purpose teaching space, especially centrally managed rooms.

67. In general, the objective-setting process suffers in that objectives are not very specific, time-bound or quantifiable, making measurement of achievement difficult.

Information

68. Over 80 per cent of institutions confirmed that they have a computerised database of rooms, room sizes by net internal area, categorisation of rooms (e.g. teaching, research or support) and identification of room by user (e.g. by occupying faculty, department or unit). Fewer institutions had room sizes by capacity or a record of the number of teaching workplaces.

Figure 4 **Space management data held by institutions**



69. There is less information about functional suitability. Twenty-three per cent of institutions state that their records include an assessment of the functional suitability of each room, 48 per cent said they did not, and 29 per cent said that they had some room-by-room information.

70. Around 55 per cent of HEIs use EMS data to inform space management decisions. When institutions were asked if they use EMS to benchmark performance, 65 per cent said that they did.

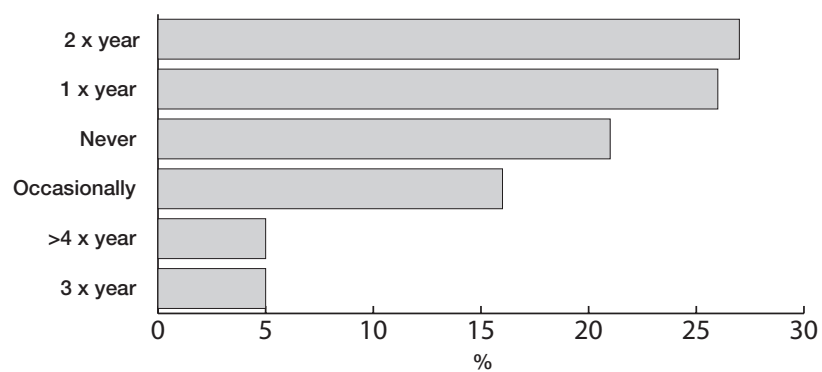
71. The most popular use of EMS is for peer group comparison. Key indicators and ratios are assessed for space management purposes. The most frequently mentioned are space per student FTE, office space per staff FTE, and the frequency and occupancy rates associated with the use of teaching space.

72. Cost benchmarking of total property costs is highlighted. In terms of individual cost components, maintenance costs are the most frequently mentioned benchmark.

73. The statistics are also used by a number of institutions as part of the decision-making process for estate strategies and, less often, for space management strategies. Some institutions use the statistics at a macro level to assess space needs.

74. Space utilisation surveys are carried out by 79 per cent of respondents. Fifty-three per cent of respondents do surveys at least once or twice a year. Ten per cent carry them out three or more times a year, and 16 per cent do them on an ad hoc basis or every few years.

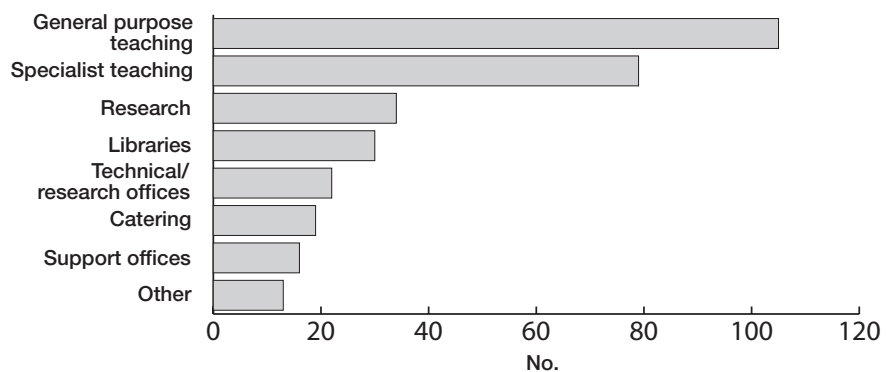
Figure 5 **Frequency of utilisation surveys**



75. Most surveys cover Monday to Friday inclusive. The most popular time period covered is 0900-1700 (51 per cent) followed by 0900-1800 (29 per cent). Some 14 per cent of HEIs survey at least a 12-hour period, usually 0900-2100.

76. General purpose teaching space is the most common type of space to be surveyed, especially pooled rooms, followed by a least some specialist teaching space. Research space, libraries and catering areas are surveyed less often. 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.

Figure 6 **Types of space covered by utilisation surveys**



77. Where HEIs carry out surveys, 86 per cent say that the results are used to manage space. Seventy-eight per cent of HEIs that carry out surveys compare bookings with observed use of rooms, and 45 per cent state that they have space utilisation targets.

Using survey results to manage space

Timetabling and room booking. Informing scheduling and decisions on the length of the timetabled day; smoothing utilisation through timetabling; checking on overbooking; fining systems where rooms are centrally booked and not used.

‘Schools are fined for not using booked rooms, with the money collected spent on improving classrooms.’

‘Feedback on non-use of booked accommodation [is] given to faculties and schools by modules. [A] scale of fines [was] adopted to promote a culture of releasing space not needed.’

Space allocation. Results used to moderate requests for space; reallocating under-used space for other purposes; dealing with requests for additional space.

Refurbishing and remodelling. Improving fitness for purpose including audio-visual provision; remodelling under-used rooms to get appropriate capacities; identifying rooms which are not suitable any more.

Strategic planning. Identifying needs and trends; using the database for planning course developments; informing decisions on future buildings; part of the project planning process.

The results of the surveys are often given to departments and faculties to promote a better understanding of how space is used and encourage more effective utilisation. But this is difficult for some institutions. For example:

‘Results are used to demonstrate daily and weekly fluctuations in demand for rooms. However, this has had little effect on established patterns of room use – cultural issues.’

‘[We] don’t have a target frequency. Blocks on progress are staff preference and [the] need to raise timetabling to a higher level.’

78. Based on 17 responses from HEIs in the telephone survey, access to base data of 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 specialist space is needed and what group sizes will occupy the space.

Communication

79. Most HEIs (65 per cent) do not issue space management guidelines to users; 22 per cent do. The remainder provide some information or advice. For example, some institutions give space management advice when requested by departments or provide guidelines in particular circumstances, such as when new space is planned.

80. In terms of involvement in developing space management policy, participants in the telephone survey made a range of comments:

'Don't have a policy at the moment.'

'Not per se – only if there's a specific project.'

'Still a long way to go.'

'Not really.'

'Whole financial viability has led to schools being more co-operative.'

'Now through the resource allocation model, users are much more involved.'

'Yes, through the deans.'

'Yes, via the registrar.'

'Recent development – the space allocation group now includes schools/departments but non-academic departments are not included.'

81. Institutions taking part in the telephone survey view cultural issues and functional suitability as the principal barriers to more efficient use of space, as the following comments illustrate.

Cultural barriers

'Problems with territoriality.'

'Culture and ethos make it difficult to use tools such as central timetabling.'

'Strength of the divisions.'

'Reluctance to share offices.'

'Assumption of [the] right to a certain size of office.'

'Custom and practice in terms of when and where things happen.'

'People don't like change.'

'Things have always been done like this, but it's easier with new staff.'

Functional suitability barriers

'Condition and environmental quality e.g. ventilation.'

'[We] have older buildings which are not very flexible.'

'Quality of the space is as important as the amount.'

'Physical barriers due to existing configuration.'

'Configuration of space makes flexibility difficult.'

82. Other barriers include the fact that in specialist institutions many rooms are only suitable for a small range of uses. Also, compromises have to be made to teach at times when students will attend and, that if space is not paid for, it ‘doesn’t matter’.

83. Institutions in the telephone survey highlighted cost awareness, improved quality and transparency of process as the main incentives to getting buy-in to space management methods.

Comments on incentives

‘Primarily cost – this is the biggest motivator.’

‘Financial – devolution of cost.’

‘[We] have brought home the space problem, but don’t think they have any idea about the full cost – TRAC should help.’

‘Cost is better than soft incentives.’

‘Needs to be transparent and have a payback for users.’

‘Showing how well it can be done – leading from the top e.g. the vice-chancellor is in open plan.’

‘Quality for recruitment and retention.’

‘Quality – could have less but of a better quality.’

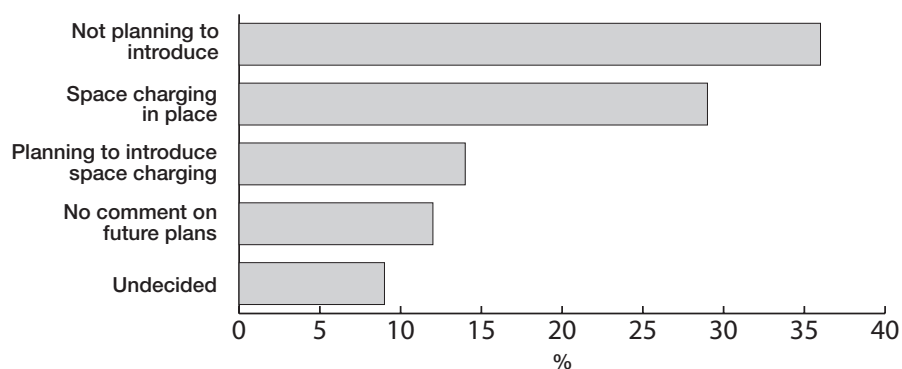
Space management tools

Space charging

84. Twenty-nine per cent of institutions have space charging. This proportion is similar to the findings of the EMS project.

85. Fourteen per cent of HEIs are planning to introduce charging, and 9 per cent are undecided. The large majority of the remainder are not planning to introduce it.

Figure 7 **HEIs’ plans for space charging**

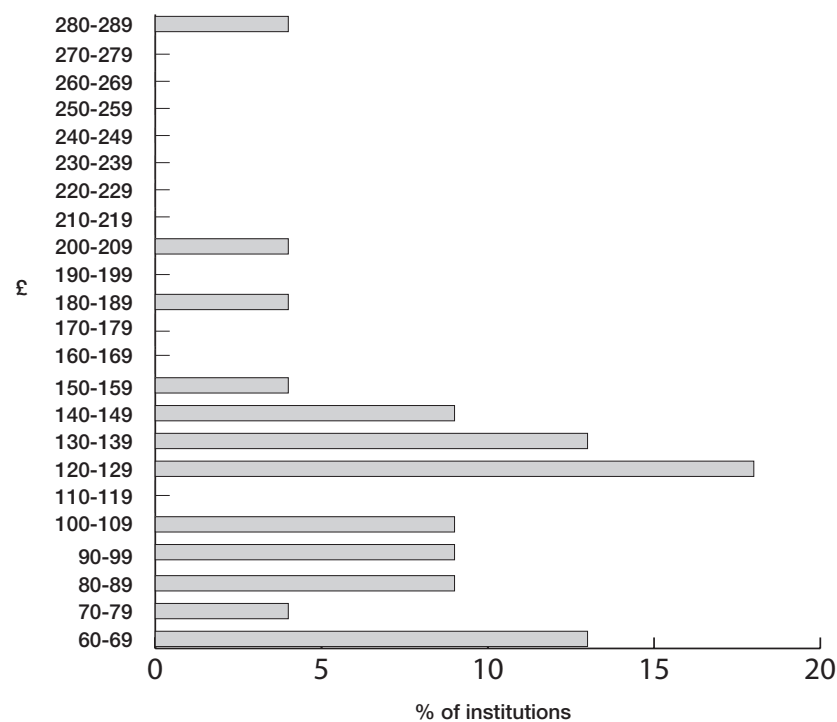


86. Of the HEIs with space charging, 63 per cent are pre-1992 universities, 27 per cent are post-1992 universities, and 10 per cent are colleges. Just over half of these HEIs operate space charging within a devolved resource allocation system. Where institutions have decided not to introduce charging and have given information on the type of institutional budgetary system in place, most of them (90 per cent) currently top-slice estate costs.

87. Sixty-nine per cent of institutions surveyed said that they had a flat rate space charge.

88. Where HEI respondents reported a flat rate charge, the charge per m² ranges from under £60 to just under £300. The median is £126 per m².

Figure 8 **Flat rate space charge per m² per annum 2003-04**



89. In terms of data on the operating costs of different types of space, 17 HEIs in the telephone survey responded. One said that yes the data are available, as a result of the introduction of a new system. The other 16 did not have data. Although it would be possible for some to get building-by-building data, many buildings have a mix of uses. In a few cases (the examples given were libraries and research use) respondents thought it might be available. The overall view was that the data are not generally available and that it would take a lot of work to get it. Comments included: ‘not sure about the added value’, and ‘it would be a financial nightmare with no benefit’.

90. Ten HEIs gave details of their variable charges. Most of the variation relates to differential utilities and maintenance costs. Two examples are shown here.

Example 1 Variable space charges per m² per annum 2003-04

Space type 1	£90	Basic office space with normal loads, would apply to workrooms, non-ventilated lecture rooms etc
Space type 2	£100	Ventilated areas – i.e. computer rooms, ventilated lecture rooms, library, basic laboratory space, or space with moderately high electrical demand
Space type 3	£110	Air-conditioned space
Space type 4	£150	Laboratory space with fume cupboard(s) Laboratory space with high water demand Laboratory space with high electrical demand
Space type 5	£160	Laboratory space with fume cupboard(s) and high water demand Laboratory space with fume cupboard(s) and high electrical demand
Space type 6	£170	Laboratory space with fume cupboard(s) and high water/electrical demand

Example 2 Variable space charges per m² per annum 2003-04

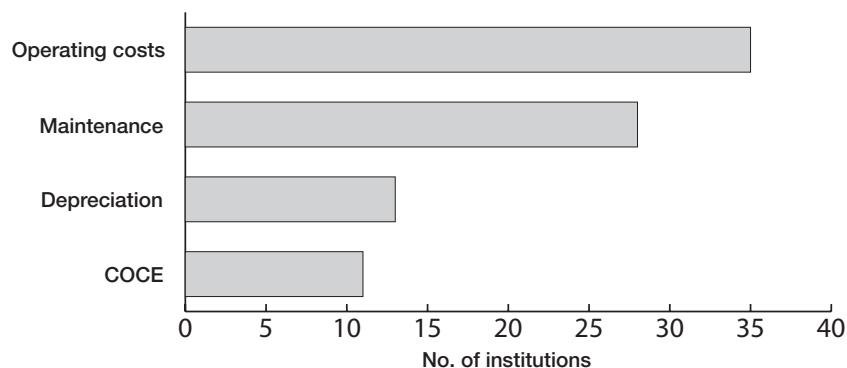
Space type 1	£14	Unheated, unserviced space
Space type 2	£70	Office, teaching, library
Space type 3	£139	Lightly serviced labs and ancillary space
Space type 4	£209	Highly serviced research and other environmentally controlled space

91. The Newcastle report (see paragraph 43) recommended that the space charge should cover:

- annual operating costs
- maintenance to keep the estate's condition to the original specification
- depreciation – the long-term cost of planned renewal and upgrading the estate to maintain fitness for purpose
- cost of capital employed (COCE).

92. HEIs report that their space charges include the following:

Figure 9 **Space charge components**



93. There is no correlation from the survey results between institutions which include all four cost components in their charge and high costs per m². A complicating factor is whether, and how, institutions choose to charge for non-departmental space, such as pooled rooms, libraries and administrative space.

94. Most HEIs that charge for space update the charge annually.

Space charging case study 1 – meeting a strategic objective

Faced with the need to reduce costs by around 2 per cent, one university took the decision to use a gross income model to identify the net financial contribution of each academic school. Part of the model included charging users for the full cost of space. The charge was initially set at £200 per m² to cover operating costs, maintenance, depreciation and cost of capital. It was applied on a flat rate basis across the net internal area occupied.

There was a transition period to enable schools and departments to assess the resource implications and consider what changes, if any, to make. It was apparent that those with the largest net deficit were in the academic schools with most specialist space, which had been subject to significant changes in the breadth of provision and teaching volume. Space provision had not been reduced in line with need.

The model was introduced at a time when student numbers and research activity were increasing overall, but some subjects had lower growth, or were in decline, particularly in some areas of science and the built environment. Before implementing budget reductions based on the outcome of the gross income model, academic schools were given the opportunity to examine their space needs and release dedicated space. The value of space given up was used to lower the required budget reductions for the academic schools concerned.

The university had recently prepared an estate strategy and was aware of the comparative performance of buildings in terms of functional suitability, utilisation rates, backlog maintenance and compliance works. One building with a net area of around 7,600 m² performed very poorly. It was mainly single storey, occupying a large footprint on a campus with an otherwise high density of development where land was at a premium. The deep plan building had teaching rooms with poor environmental conditions, no natural light in some rooms, cramped mezzanine areas and narrow staircases. It also had one of the highest backlog repair requirements per m² across the estate. This building was used partly as pooled teaching and computing space, and partly by schools with large areas of specialist space in workshops and laboratories.

The HEI took the decision that it was strategically desirable to see how much space could be released in the building, plan for its phased demolition and allow for some replacement with new, high quality flexible space. It concluded that it would be feasible to work towards a first phase demolition of nearly 3,500 m². The school with the most specialist space in the building proposed to reduce its overall space holding by 1,700 m² from 5,800 m². The planned introduction of the gross income model was one of the prime catalysts for delivering the strategy.

Question: Would the university have been able to achieve the same objectives without space charging?

Answer: Yes, but it would have required much more management time, direction and input. The school which agreed to release most space would probably have had more resentment about giving up a resource which was in effect free. This way, the school identified what it wanted to give up and so was happier with the outcome.

Space charging case study 2 – rethinking the space charge

The HEI in this case study is in a high cost, city centre location. It has used space charging since the mid-1990s. Operating and maintenance costs are charged to schools based on the area occupied, with some weightings by the type of space (weighting of 1 for offices, 0.5 for laboratories and 0.25 for basement and equipment-dominated space). The average space charge before weightings are applied is around £185 per m². Some schools have additional costs: paying full rent on leased space and carrying all or part of the financing cost where new/improved space has been provided. This has led to major differences in space costs borne by schools.

The university is now rethinking the basis for the space charge in the light of these differences and its introduction of a costing and pricing strategy where space costs are a key component. It states:

‘Space represents a major investment by the university and at the present time only part of that investment is being recovered. In addition, there are no mechanisms in place to encourage the efficient use of space.... There is a need to recognise that each year a value is consumed by using the estate to provide academic services, and if we are to be a sustainable institution we need to recover that cost from income.’

Objectives of charging

Against this background, the HEI defines the primary objectives of space charging as:

- to recover the capital costs of space in an equitable manner from school income and capital grants to ensure the estate can be properly maintained and is fit for purpose – in other words that it is sustainable
- to improve the awareness of space costs and highlight that space is not a free good
- to help promote financially sound decision making.

Allocation model

The HEI is considering recovering the following costs:

- capital building costs to cover new and replacement building costs – where the university does not own the buildings the cost will take the form of an annual rental charge
- long-term maintenance requirements
- financing costs for internal/external loan arrangements
- annual running costs, including maintenance, management, utilities, cleaning and security
- financing costs and capital recovery may be required in respect of land purchases.

Potential impact of this approach

The HEI has assessed that if this approach were adopted, it could generate an average space charge of £259 per m² – the increase is a function of the cost of capital. The standard rate could still be adjusted to where space is affected by location, funding or a lower specification. Initial calculations by the university indicate that space charging on this basis could generate additional space overheads of £4.9 million compared with current forecasts. However, some schools would be in deficit so a phased approach to the capital component is proposed during a transitional period.

Next steps

The university is planning to make a decision on the way forward in the next few months, and as part of this will reconcile the approach outlined here with the TRAC steps for allocating space costs.

95. The main reasons against space charging given by HEIs which do not do it or plan to introduce it are:

- bureaucracy and administration
- costs outweigh benefits
- not supported in principle
- limited effect in the long term
- divisive
- already have good space management systems in place
- not appropriate for a small institution.

Comments from HEIs which have decided against space charging

'Too complicated. Too many difficulties with overcrowded estate to achieve any benefit – there is very little variance in space allocation between schools/departments.'

'Feedback from other institutions where it has been implemented, included:

- *limited perceived benefit after initial implementation*
- *difficult and costly to administer*
- *space released is of low quality/in isolated locations and not easily used by others.'*

'Space charging may be introduced from the financial transparency and management point of view but not from a space management one ... We prefer a pro-active space management system that identifies where shortfalls and over-provision are and puts in place an action plan to address them.'

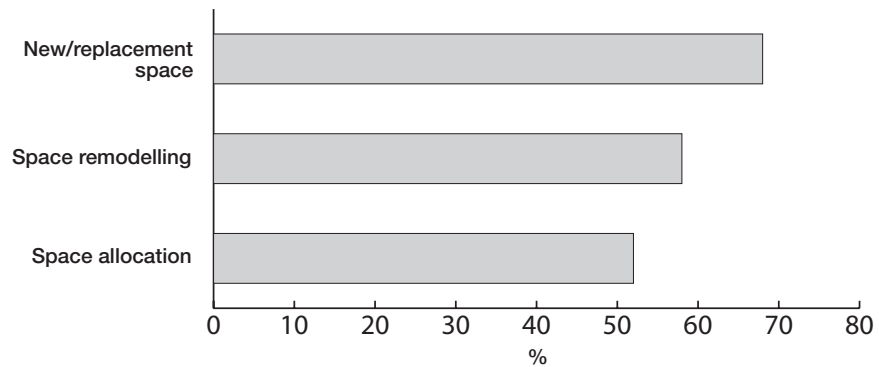
'Space needs of departments are largely determined by areas needed to accommodate technical facilities such as kilns, foundries and furnaces. There is very little flexibility for departments to modify their expenditure on space.'

Space norms and standards

96. The space management survey set out to find out how far space norms and standards are currently used by HEIs.

97. Seventy-eight per cent of respondents use space norms for allocating space, remodelling space and/or planning new or replacement space. More use them for planning new space than allocating or remodelling existing buildings.

Figure 10 **Use of space norms/standards**

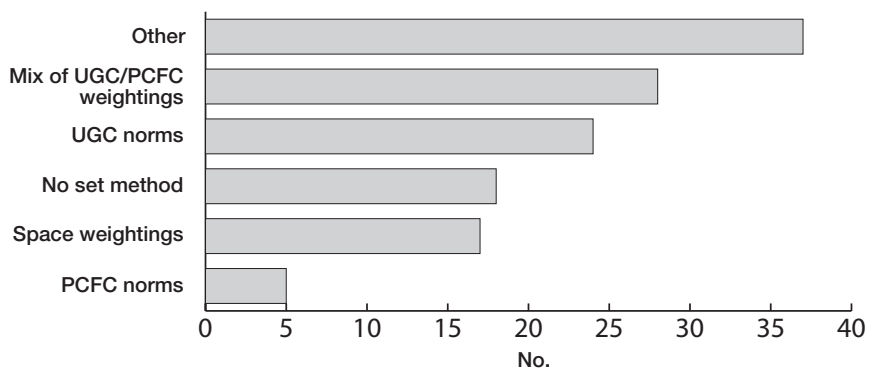


98. HEIs were asked about the types of standards and norms in use. Three specific methods were included in the list of options. These were:

- UGC norms – set out in the University Grant Committee’s ‘Notes on Control and Guidance for University Building Projects’ (last major update in 1987)
- PCFC norms – produced by the Polytechnics and Colleges Funding Council in the ‘Guidance on Estate Management’ in 1990
- space weightings – produced for the UK Funding Councils in 1995 and based on the concept of relative requirements for different academic subjects.

99. HEIs were also asked if they used a mix of these three, had no set method or used other norms/standards.

Figure 11 **Types of norms/standards in use**



100. Forty-five per cent of respondents use UGC norms and/or PCFC norms, space weightings or a mix of the three. Some HEIs have made their own modifications to the norms. Both the UGC norms and space weightings are used much more often than PCFC norms. Thirteen per cent of respondents use no set method.

101. Twenty-seven per cent of respondents use other methods as well as or instead of these three. Institutions that use other methods frequently do this

in conjunction with norms or weightings. Where sources were given for these, the most common were standards or norms which were developed by the institutions themselves, advice from consultants, external sources, such as Wellcome Laboratory Guidelines, and Department of Education and Science (DES) design notes.

102. Institutions were asked if they made adjustments to the standards/norms in use. Thirty-four per cent of respondents that use them said yes. Most of the examples given were reductions.

Comments on norms used

'[We use] PCFC norms with a reduction in the general and specialist elements of each norm by 50 per cent and 30 per cent respectively, with the exception of one school that primarily uses specialist teaching space for course delivery.'

'UGC norms are adjusted to the institutional staff:student ratios. Results of norms are examined for a band of -10 per cent to -30 per cent of adjusted UGC norms, with -20 per cent as a performance target.'

'[We] devised [our] own space reference areas based on UGC standard area per workplace but take account of hours of instruction given to undergraduates.'

103. Forty-seven per cent of respondents use space standards. Where information was given on the standards being used most relate to office areas.

Examples of standards used

'Management offices 20 m², other single offices 9 m², other office space 7.5 m².'

'Professors and heads of schools 20 m², other academic staff 15 m², support staff 8 m².'

'10 m² for non-academic and administrative staff and a standard computing area of 3.5 m².'

'[We] use a planning norm for office space of around 6-8 m².'

'[We have a] policy of providing not more than 10 m² per FTE staff in new and replacement space.'

'Offices 7 m² and laboratories 3 m² per workplace.'

104. As part of the telephone survey, respondents were asked for their views on space norms for the sector. More comments were positive than negative, but caution was expressed about the feasibility of sector-wide norms and the problems of keeping them up to date.

Some HEI comments on space norms

'[We] have used weightings.'

'Trying to decide on space norms is difficult and they need to be kept up to date.'

'[We] had norms 10 years ago – now [we] don't have anything.'

'Yes, new ones would be useful – [we] have used weightings.'

'Yes, for the sector in general but [I] don't think it would be much use in specialist institutions.'

'[A] good starting point – [to] set [a] benchmark for the sector.'

'...think [it's] feasible – although what is right for one may be wrong for another.'

'[I] think they still have some use.'

'In the past there's been focus on people per square metre instead of productivity.'

'Don't believe in them.'

'[It] assumes a given set of actions – norms for research would be more use.'

'Charging needs targets to deliver change.'

'Use – but as a guide only – [a] way of benchmarking.'

'Think [there's a] need to establish norms eg for staff and to have examples of good practice.'

'[It's] useful to be able to benchmark but [there's the] problem of learning and teaching changing quickly.'

Central timetabling

105. From the responses received, 86 per cent of institutions have central computerised timetabling of at least some of their teaching space.

106. Two case studies are included here. In one, the introduction of a computerised central system was highlighted by the HEI as being the key to improvements in its space management, and is now being used to deliver its strategy of campus rationalisation. In the other case study, the HEI has used central timetabling of most of its teaching space to improve utilisation.

Timetabling case study 1 – space planning

One HEI has a strategy to cut its campuses from nine to four. It has around 15,000 FTE students with large numbers of part-time, international and mature students. There are also many part-time staff. It wants to get as much stability in the timetable as possible to help students and part-time staff to plan their other commitments.

Timetabling used to be done by individual schools. Ten years ago, the university adopted a big bang solution by buying a computerised timetabling package and scheduling all teaching except for some art and design courses. Apart from some studios and workshops, all specialist space is timetabled, including computing rooms and laboratories. The timetabled day on most campuses is 0930 to 2130. The institution is thinking about timetabling space at the weekends because booked frequency is now running at 89 per cent, which gives very little leeway for any changes or ad hoc bookings.

The HEI has used its timetabling software to plan space needs as part of the process of campus rationalisation. It is currently consolidating two campuses. One is being sold, and the other – using ‘what if’ scenarios to understand the loading placed on any individual classroom/facility – remodelled to accommodate the combined uses. It timetables students into seminar groups to ensure room capacities are not breached. As part of the process, there will be a net reduction of approximately 11,000 m².

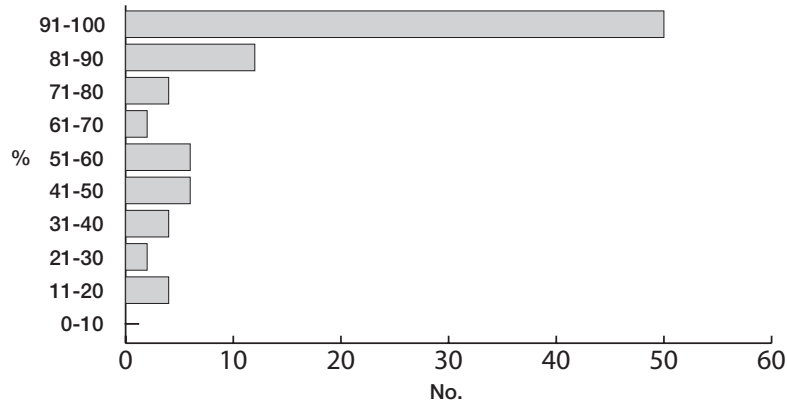
But although the total area occupied by the HEI will reduce, it is not thought that there will be an equivalent saving in annual costs. The institution is losing poor quality space with high backlog repair liabilities. It recognises that for the retained estate to be sustainable, there needs to be increased spending per m² on maintenance.

Timetabling case study 2 – achieving high utilisation rates

One HEI uses its timetabling system to aim for high utilisation rates of teaching space. It has a target frequency rate for teaching space of 85 per cent between 0900 and 1700 and a target of 65 per cent between 1700 and 2100. Its overall utilisation target is 50 per cent. It has just under 2 m² of academic area per FTE student. The timetabling system includes all general purpose space and 80 per cent of specialist teaching space. All the specialist space will be included from 2004-05.

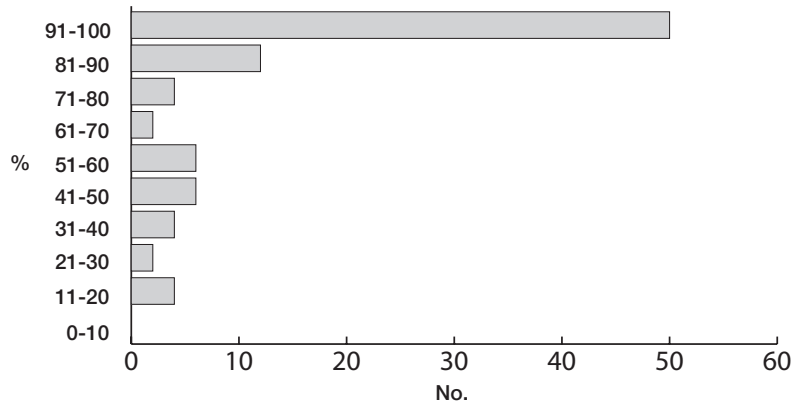
The HEI has an FTE population of just over 13,000 with a lot of part-time and mature students. It tries to be flexible to accommodate their requirements. Staff are given little choice of times or locations for teaching. The timetabling unit is, in its own words, ‘very prescriptive’. It knows from student records how much time and space modules need in each faculty. All teaching activity is recorded and the timetabling unit targets back-to-back activities throughout the day. The timetablers have a strong management position with full support and backing from the vice-chancellor. The system is transparent for staff and students, and the HEI has worked hard to build confidence in the system for users.

Figure 12 **What proportion of general purpose teaching space is centrally timetabled?**



107. Over half of the respondents have 90-100 per cent of their general purpose space centrally timetabled. Forty-five institutions stated that they have 100 per cent of their general purpose teaching space centrally timetabled.

Figure 13 **What proportion of specialist purpose teaching space is centrally timetabled?**



108. Fewer institutions timetable specialist teaching space, but 18 HEIs stated that all their specialist space is centrally timetabled. These institutions are also centrally timetabling 100 per cent of their general purpose space.

109. Twelve per cent of HEIs centrally timetable all teaching space.

110. Follow-up discussions indicated that for some institutions there had been clearly identifiable benefits from using systems that included all their teaching space.

Timetabling case study – maximising frequency rates

One HEI has centrally timetabled all its teaching space for the past two years. It has around 80 teaching rooms. Most are used for general purpose teaching. Staff responsible for timetabling are part of the Learning and Teaching Unit. The timetable is built up with direct access to the academic record. The institution has its timetabling policy available on the web which sets out very clear guidelines for staff on:

- the teaching day and week
- constraints on teaching availability
- timetable construction
- teaching rooms
- requests for timetable changes
- adherence to the published timetable
- cancelled courses and room bookings.

The HEI surveyed utilisation in all teaching rooms in December 2003. The scheduled room frequency rate for all teaching rooms between 0900 and 1700 was 88 per cent and the scheduled room occupancy rate was 75 per cent, giving a scheduled utilisation rate of 67 per cent. This was an increase of 17 per cent over the previous survey week 12 months earlier.

The survey results revealed lower actual utilisation. Average observed frequency in the week of the survey was 75 per cent, with average seat occupancy of 43 per cent, and an observed utilisation rate of 32 per cent. The HEI identified the number of activities booked but not taking place as a key issue for action. The lower occupancy rates of the larger teaching rooms also highlighted the mismatch between room capacities and teaching needs. As a result it has carried out a comprehensive review of teaching room size, suitability and equipment requirements.

The HEI is considering how learning and teaching, and estates strategies can develop together, but even at this stage it has found that the full use of timetabling across all teaching space has maximised the planned use of space and enabled it to vacate rented premises off-site.

111. The length of the timetabled day varies across HEIs. Almost all operate a day from at least 0900 to 1700. Forty-six per cent have at least a 12-hour timetabled day, usually 0900 to 2100. A few have longer days, such as 0700 to 2200. These are often specialist institutions, for example those teaching music or drama.

112. Eleven per cent of respondents are considering changes to the timetabled day. These include extending undergraduate teaching into the evening, starting earlier (0800 or 0830) and some weekend teaching. Eighteen per cent of HEIs have plans to increase the amount of space in the central timetabling system.

113. Five HEIs in the telephone survey identified barriers to the effectiveness of central timetabling:

'Staff are the barrier – they have their own personalised systems.'

'People won't use it for fear of losing control and it's too complicated.'

'People put in preferences for rooms. They overestimate the group size but there is a problem because of the flexibility of choice once the semester starts.'

'People want to teach at the same time (1000 to 1500).'

'[The] functional suitability of the teaching space [is a barrier].'

114. In terms of the flexibility that users have in booking preferred times and locations, seven HEIs in the telephone survey gave comments including:

'Users might have a preference but they get what is available.'

'1000 to 1500 is preferred, but we place onus on timetablers in faculties to get effectiveness – [it] works well.'

'Block-booking is an inefficiency in the system – [we are] talking about fixing.'

'Yes, users have flexibility, but how to achieve a cultural change? [We] want to look at this and optimise the use of space.'

115. HEIs made a range of other comments outside of the survey structure. Some related to their own experience or what they had found helpful. Others related to issues where the individual HEIs would like more guidance.

Other comments on space management

'Research on the use of office space by academics would be helpful, considering reasons for perceived need for individual offices, what the barriers are to shared occupation and open plan space and how these could be overcome. It would be interesting to analyse the advantages/disadvantages of different types of space (individual offices, shared and open plan) and do some form of option appraisal both financial and non-financial to determine the costs and benefits of different occupation modes.'

'As a small specialist institution there is not the same need for complex management and charging systems.'

'Recently installed software [is] to be used to aid space management. [The] system has a space information database with a graphical interface to display information. [It has been] proposed that it will be accessible via the internet across the university to improve transparency of data.'

'We have developed a number of analysis spreadsheets to assist with space planning. They combine student data (numbers and module choices) with course delivery information to identify the room need for a given specialist area, general purpose teaching or potential for the university as a whole. Student numbers, the length of the working day, class sizes and target frequency of use are all variables. These allow the spreadsheet to model increases in student numbers, changes to teaching practice, expansion or contraction of resources, or a combination of all three.'

'As an institution with a low space:student ratio, we work hard to make [the] best use of space and to continually improve our efficiency. Quality of space should also be a consideration and categorised to reflect the sector position, for information and appropriate action.'

'[We] would welcome guidance on the costs of research space and how to manage teaching patterns when staff are heavily involved in research...also, [guidance on] how to have better management of administrative space.'

'[It is our] intention to set up a space management group which will examine the usefulness of norms.'

'Many people are hoping for a simplistic formulaic answer such as norms or charging. These are not adequate for the problems faced. Nor is extensive data gathering to feed into formulae, as institutional standards and missions are so different. The affordable estate size is actually very simple to calculate as a percentage of institutional income that is affordable applied to a rate/m².'

'[It is] important that HEFCE embark on a review of the norms not as an allocation tool but more of a technique in developing space requirements. It will always be for institutions to be responsible for space and it will always be a management decision. We should not allow poor management to be an excuse not to update what was a very valuable tool in the management of a large institution. The amount of time and effort put in by all universities independently on this subject is large and a very inefficient use of resource. The worst outcome of not having examples of space requirement for different subject groups is that small institutes are not learning or improving their processes and many rely on external bodies who do not necessarily have the tools or understanding themselves.'

'Space management requires resources in terms of staff time and computer systems back-up that proved to be difficult to provide on top of other property management responsibilities. However, the value of doing so is clear and is therefore pursued.'

Impact of space management tools

116. The statistical model described earlier (paragraph 49) was used to assess whether there is a correlation between using space management tools and having improved space performance. The model enabled the impact of the space management variables to be considered in addition to the effect of the external drivers affecting the size of the estate.

117. The tools analysed were space charging, space standards and central timetabling. Hypotheses about the effect of each were tested using EMS data, the SMP space categories contained in Annex B, and the results of the e-mail survey.

What is the effect of space charging?

118. When the NAO reported on its study of space management in HEIs in Wales in 1996, it concluded that institutions should give full consideration to introducing appropriate space charging systems to secure improvements in space utilisation:

‘Charging academic departments directly for the cost of space which they occupy can encourage the efficient use of space by promoting awareness among users of the cost of accommodation and by devolving accountability for achieving efficiencies in space use to users of accommodation. Different charging systems can apply within different budgetary structures.

‘Experience in other organisations suggests that departments will often require an incentive before they will release space to central control or accept central timetabling.

‘Space charging provides the most effective incentive.’

119. Of the 29 per cent of HEIs that use space charging, some have had systems in place for a number of years while others have introduced charging only recently. Other institutions once had charging but have now abandoned it as a space management method. Nor is space charging done on a uniform basis across the sector. The level of charges varies, and there are different ways of accounting for space that is not part of an income-generating unit.

120. Against this background, four hypotheses were tested, with the following results:

- a. **Hypothesis: an HEI with space charging has less space.** It was found that institutions that charge for space have less space than those that do not. On average, they have 12 per cent less space. Space was defined here as total non-residential area, and the data used were the institutional returns as part of the EMS project.
- b. **Hypothesis: an HEI with space charging has less academic space.** It was found that institutions with space charging have less academic space than those that do not, but the effect varied between the three categories of space. Space charging had a statistically significant effect on both the core teaching and research space, but not on teaching offices. Academic space was defined as core teaching, teaching offices and research space as reported in EMS.

- c. **Hypothesis: the higher an HEI's space charge, the smaller its total floor space.** Using the data on space charges returned in the e-mail survey, there was no significant correlation between the scale of the space charge and the size of the estate.
- d. **Hypothesis: the longer an HEI has used space charging, the smaller the total area held.** It was found that that the longer a space charge has been in place, the smaller the size of estate relative to other institutions with space charging.

Space charging – space management good practice principles

121. Effective space charging can have wide benefits through:

- making the cost of using space transparent
- helping to overcome a culture of seeing space as a free good
- encouraging close examination of how much space is actually needed
- providing an incentive to reduce direct costs by reducing space occupied
- enabling faculties/departments to take responsibility and make their own decisions about how much space is needed and affordable
- enabling rooms released to be used for other purposes.

122. It is often easiest to see these benefits where there is strong top-level support for the system, and where space charging is an integral part of a resource allocation system using a devolved cost and income model. However, there can be criticisms that space charging is time consuming and an additional administrative burden which is divisive and a distraction from core academic activity.

123. Problems such as these tend to be minimised where the following practice is in place.

Calculating the charge

124. The closer the charge is to the real cost of space, the better.

125. The companion report, 'The cost of space', can help HEIs to define the real cost of having an estate that is fit for purpose and in good condition, as an annualised cost per m² of net internal non-residential space.

126. The space charge could be based on the sustainable estate provision or it could be based on the total estate provision. The sustainable provision includes actual recorded operating costs, the cost of maintenance to keep the estate in good condition, and depreciation costs to allow for periodic refits and replacement. The total estate provision also includes the opportunity cost of capital. The latter could be used as the basis of the charge where it is the objective to encourage efficient use of capital resources and an awareness of the opportunity costs of occupying buildings.

127. The charge needs to be reviewed regularly, at least annually, in line with updating the sustainable or total estate costs of the space.

128. Charges can be applied on an average flat rate basis or on a variable basis to reflect type of space, age and condition. In general, there are benefits in avoiding over-complication. If variable charges are used, they need to be based as far as possible on the actual costs of occupying different types of space. But this can be difficult given that few HEIs currently have such detailed data.

Floor space data

129. Full and accurate data on floor space provide the basis for the attribution of space costs. The data include area, function and user updated on at least an annual basis and agreed with the faculty/department that will pay the charge. Discounts may be applied to areas to be charged for to allow for bad fit space, for example in mezzanines with poor head height or in listed buildings.

Standard of facilities

130. An agreed standard of facilities provides clarity about what faculties/departments can expect for the charge they pay. In effect, it is a service level agreement.

Levying the charge

131. The charge is usually levied at the unit level of faculties/departments. It is applied to both faculty/department space and to central space.

132. The charge for pooled or shared accommodation can be levied in several ways, such as on the basis of agreed percentages between the users or the actual time used. Charges may be variable, with premium rates for the most popular times. Whichever method is chosen, it needs to be applied on a clear and consistent basis.

133. The space costs of non income-earning departments can be re-allocated using drivers, such as student load, total income or space occupied, but in all cases the costs need to be published. Indirect costs are hidden costs, and the space costs of support functions need to be transparent and available to all staff.

Communication and consultation

134. Effective communication includes issuing guidelines to staff on:

- what constitutes faculty/departmental space, pooled/shared accommodation and support space
- how the charge is calculated and applied, including charges for pooled or shared accommodation and support space
- what standard of facilities/services are to be provided
- details of the space costs of non income-earning support functions and how these are reallocated
- the circumstances in which modifications can be made to the charge levied, for example whether it is line with the way other changes are made to faculty/departmental budgets. If there are any exceptional circumstances the criteria for these should be specified

- how faculties/departments can give up space or request additional accommodation and what the effect will be on the space charge
- what is the basis on which space can be relinquished and excluded from the charge, and whether faculties/departments will continue to be charged if space relinquished remains vacant
- guidance on how disputes are to be resolved
- what the consequences are of incurring a deficit on the space charge.

What effect do the space standards used by HEIs have?

135. The NAO proposed that institutions should develop a space model which compares possible future space requirements with the current distribution of space. While noting that norms had been used to good effect by HEIs as a starting point for assessing how space should be allocated between users, they ‘are now widely perceived as being outdated and not reflecting current patterns of teaching activities’ (NAO). The report said little about the role of space standards in assessing space need.

136. But the Newcastle study concluded that while space standards are time and resource consuming to assemble and agree, their transparency and fairness appeal to users. It found:

‘At some collaborating universities tight space standards contribute to high efficiency, although the resulting effectiveness of the space would be considered unacceptable at other HEIs. Elsewhere, space standards are extremely generous, arguably perpetuating space inefficiency.’

137. EMS data are used to calculate a series of ratios, such as the amount of non-residential space or academic space per FTE student, and office area per FTE staff member, but they do not include data on the space standards used by institutions. Nor did the e-mail survey yield many details of the actual space standards employed by HEIs. Follow-up discussions provided some insight into the effect of using the standards for particular projects, and there are examples of HEIs operating very different standards for similar activities, such as the area of office space allocated per member of staff.

138. The study sought to test the hypothesis that institutions with lower space standards (that is, less space per generic type of activity) have less total space. However, the survey did not provide a large enough sample with enough data on space standards to confirm whether this is the case across the sector.

What is the effect of central timetabling?

139. The NAO was clear in its recommendation:

‘There is scope for institutions to achieve significant improvements in the efficiency of space use by increasing central control of teaching accommodation. Specifically, institutions should consider using a computerised timetabling package.’

140. Data are provided through EMS on the amount of core teaching space that is centrally timetabled. The e-mail survey provided additional data on the amount of general purpose and specialist teaching space included in central systems and on other aspects of timetabling.

141. Four hypotheses were tested, with the following results.

- a. **Hypothesis: an HEI that uses central timetabling has less core teaching space.** This hypothesis focused on whether having any central timetabling at all had an effect on core teaching space. It included analysis of HEIs with widely differing proportions of centrally timetabled space. No statistically significant relationship was found. The fact that an institution has some central timetabling does not of itself have a significant effect on the amount of core teaching space.
- b. **Hypothesis: the greater the proportion of core teaching space that is centrally timetabled, the smaller the core teaching area.** The result was a clear and statistically significant correlation between increasing proportions of centrally timetabled core teaching space and an HEI having less core teaching space. Where institutions centrally timetable all their core teaching space, they were found on average to have 17 per cent less space than other HEIs. Thus, the critical factor is the amount of space included in the central timetabling system.
- c. **Hypothesis: the longer the timetabled day, the smaller the core teaching area.** There was no statistically significant effect.
- d. **Hypothesis: the longer that central timetabling has been in place, the smaller the core teaching area.** There was no statistically significant effect.

Timetabling – space management good practice principles

142. When a central timetabling system works well, there are wide benefits:

- improved course planning
- improved course delivery
- fewer clashes and more flexibility
- improved room booking process
- fewer shortages of rooms for teaching
- improved space planning for new/replacement and/or remodelled buildings
- clear scheduled utilisation data
- ability to model space needs where new courses are planned
- reduction in space needed, enabling rooms released to be used for other purposes
- flexibility in room layout and ability to alter it quickly to suit lectures or seminars.

143. The study showed, however, that even with high levels of space centrally timetabled, there can be problems with effective space management. Utilisation levels may still be low and there may be complaints about lack of availability of rooms, particularly at popular teaching times. Reasons for these problems include: too many constraints on staff availability to teach, poor quality and unpopularity of some teaching rooms, overbooking or block-booking rooms, and students and staff spending too much time travelling between teaching rooms. Students' availability and preferences for teaching times also have an impact.

144. Where central computerised timetabling works effectively, HEIs have most or all of the following good practice principles in place (demonstrated by the survey findings, and good practice guidelines from the NAO, the Newcastle report, Academic Institutions Management Services and Southern Universities Management Services).

Top-level support

145. Support from the highest level of institutional management is a critical success factor.

Organisation and resources

146. **Staff resources.** There needs to be a skilled timetabling team, with the seniority, knowledge, resources and experience to create trust in their abilities. They must be technically skilled and be good communicators with their academic colleagues. The team needs to have the resources to respond quickly and effectively to requests from users of the system.

147. **Location.** The timetabling function is often based in registry or estates offices. It can work effectively in either (or in other locations) where there is close co-ordination and communication between registry and estates. Both will need access to data collected by the other to get the best fit between teaching needs and space provision.

148. **Software.** For effective space management, systems need to be able to model 'best fit' and 'what if' scenarios to help plan for new course developments or increased levels of utilisation. The software should be linked to student, course and space records data.

149. **Room resources.** Maximising the space management benefits from timetabling will also entail keeping all teaching rooms to a satisfactory standard in relation to condition, accessibility, furniture and equipment.

150. There may be benefits in adopting a minimum acceptable standard for all teaching rooms.

Clear policy

151. A clear policy helps to set standards and reduce confusion and complaints. This could include establishing and agreeing principles on:

- specification of what constitutes the teaching day and week
- institutional policy on staff availability for teaching, subject to agreed constraints

- principles of timetable construction
- institutional priorities for allocating rooms
- location and zoning of teaching activities
- definition of turnaround time between timetabled events
- framework for requests for timetable change, the timescales for making requests, specification of reasons for automatic changes and procedure for addressing all other requests
- framework for notification of cancelled courses and room bookings
- framework for ad hoc requests
- framework for rapid resolution of any operational issues in the practical alteration of room layouts
- framework for any penalties for non-adherence to the policy.

Maximising scope

152. All teaching events and ad hoc events should be included, that is undergraduate, postgraduate, continuing education and short course needs for lectures, practicals and seminars. Conferencing activities may also be included.

153. The number of rooms under central control should be maximised, including specialist rooms.

Full and accurate data

154. An up-to-date database of room availability is needed, including location, function, layout, furniture, equipment, and capacity (for the predominant teaching mode).

155. Audits of utilisation will inform how actual use compares with scheduled use. They will allow monitoring for overbooking in terms of number of rooms booked, length of time rooms are booked and numbers of weeks bookings are scheduled for.

156. Requests for certain sizes of rooms can be cross-checked with enrolment data for numbers on particular courses or modules. Downloading the exact numbers enrolled on each course unit or module from the student database will inform the allocation of room sizes and enable reviews to be undertaken of the demand for and supply of teaching stock.

Communication and consultation

157. Effective communication is essential for central timetabling to work effectively and for staff to have confidence in the system. This includes:

- a. Allowing enough time for discussion and consultation over plans to introduce, extend or make other significant changes to the system.
- b. As part of this, the timetabling team needs to demonstrate and communicate the benefits of the system, and not solely in space management terms. Other benefits may include testing the feasibility of

strategic initiatives in course development, and improved curriculum delivery.

- c. Regular liaison is needed between timetablers and faculties/departments to understand the actual teaching needs for individual courses in terms of numbers of people, types of teaching activity and hours needed for each activity.
- d. Making sure faculties/departments are clear about what they must provide and by what date.
- e. Pooled space timetables should be generated if possible by March/April before the next academic year.
- f. Any local departmental timetables should be issued to a timetabling unit in a common format to enable common patterns of use to be identified.
- g. Making the timetable available on-screen to staff so that they can see what rooms have been booked and by whom and what rooms are available.
- h. Publishing the timetables for staff, groups, students and rooms on the web.
- i. Making utilisation survey results available and highlighting instances of booking and non-use of rooms.
- j. Aiming to build confidence in the system to reduce overbooking of rooms.
- k. In the case of persistent problems, considering the introduction of charging for time booked and size of room, or having penalties, such as fining for exceeding threshold percentages of non-use identified during surveys of actual use.
- l. Having a notice in teaching rooms with a schedule of what is provided in the room, the standard layout, and a contact point for help.
- m. Having the policy, contact points, and frequently asked questions available on the web for staff and students.

Developing performance indicators linking timetabling to space management

158. The aims of performance indicators may include:

- a. Maximising the percentage of all teaching rooms under central control.
- b. Maximising the scheduled frequency rate for room use over the core daytime timetabled week.
- c. Maximising the scheduled utilisation rate for room use over the core daytime timetabled week.
- d. Minimising the difference between the actual frequency rate for room use and the scheduled rate.
- e. Minimising the difference between the actual utilisation rate for room use and the scheduled rate.

Annex A

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Annex B

SMP space categories

Construction of space categories using 2004 EMS report

Space category	EMS data source
Total estate	Main EMS, variable D12-C1 (total net internal non-residential space)
Core teaching	Main EMS, variable D12-C3
Specialist teaching	SMG data, variable S3a
General purpose teaching	Main EMS, variable D12-C3 (core teaching space) – SMG data variable S3a
Teaching offices	Main EMS, variable D12-C4
Research	Main EMS, variable D12-C5 (research offices) + D12-C6 (core research)
Libraries/Learning resource centres	SMG data, variable S4 (library/learning centre space)
Other support	Main EMS, variable D12-C10 (total support space) – SMG data variable S4
Miscellaneous	Main EMS, variable D12-C11 (vacant non-residential space) + D12-C12 (other non-residential space)

Annex C

List of abbreviations

DEL	Department for Employment and Learning (in Northern Ireland)
DES	Department of Education and Science
ELWa	Education and Learning Wales
EMS	Estate Management Statistics
FTE	Full-time equivalent
HE	Higher education
HEI	Higher education institution
HEFCE	Higher Education Funding Council for England
HEFCW	Higher Education Funding Council for Wales
NAO	National Audit Office
PCFC	Polytechnics and Colleges Funding Council
SHEFC	Scottish Higher Education Funding Council
SMG	Space Management Group
SMP	Space Management Project
TRAC	Transparent Approach to Costing
UGC	University Grants Committee



Cyngor Cyllido Addysg
Uwch Cymru



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