

THE TOOLS FOR THE JOB: TEACHING WITH TECHNOLOGY

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1 INTRODUCTION

In 1994, as part of its 2-campus Estates strategy, LMU established a plan to build a Learning Centre (Integrated Library, computing, and audio visual and media production services), and five lecture theatres within a listed building. At that time, the Beckett Park Campus had no lecture theatres or large teaching spaces, yet within two years was planned to be the major site of the University in terms of numbers of students.

The creation of the lecture theatres faced a particular problem: providing appropriate accommodation and modern technology whilst retaining the features of the original Edwardian architecture.

1.1 BECKETT PARK CAMPUS

The Beckett Park Campus is located in the Headingley area of Leeds approximately three miles north of the Calverley Street site. The parkland Campus comprises of some 40 buildings. The land was acquired from Lord Grimthorpe in 1908 by the Leeds Board of Education. Between 1910 and 1915 a series of college buildings were built to create the first purpose built teacher education college in the country. All the original buildings are of a classical 'Wrenaissance' design, and they are now Grade II listed. In 1914 the buildings were requisitioned by the War Office for use as a hospital. In 1939 the War Office again requisitioned the site with the intention of using it as a hospital, because the large number of anticipated casualties did not materialise it was used as a training centre for the Royal Army Medical Corps. In 1978 the Great Hall, the largest building on the site was damaged by fire and the entire roof and floor were destroyed. When the work was completed it was renamed the James Graham Hall after the Director of Education who was responsible for the building of the original college, last year saw the completion of a multi million pound Learning Support Centre in the building, with an extended book collection, additional tutorial rooms and on-line facilities.

As part of the Estate Strategy three of the former halls of residence at Beckett Park have been converted solely for the use of teaching, and last summer saw the completion of a further two halls Leighton and Bronte. The conversion of the remaining halls remains an option and will depend largely on funding.

The Campus houses the majority of the University's indoor teaching and recreational sports facilities, and all of the indoor sports teaching provision. The Regional Gymnastics Centre was constructed in 1989 to meet both the needs of the University and gymnasts from the community. The campus offers other excellent sporting facilities including swimming pool, dance studio, squash courts, gymnasiums and an outdoor running track. University Sport has been successful in securing a lottery grant which will be used to extend the sports pavilion and construct synthetic turf pitches. December saw the £2m refurbishment of the refectory with a variety of cuisine available. The refectory has been designed to appeal directly to students and the decoration and fittings reflect their tastes.

The faculties represented at Beckett Park include Information and Engineering Systems, Cultural and Education Studies, Leeds Business School and also the Centre for Language Studies.

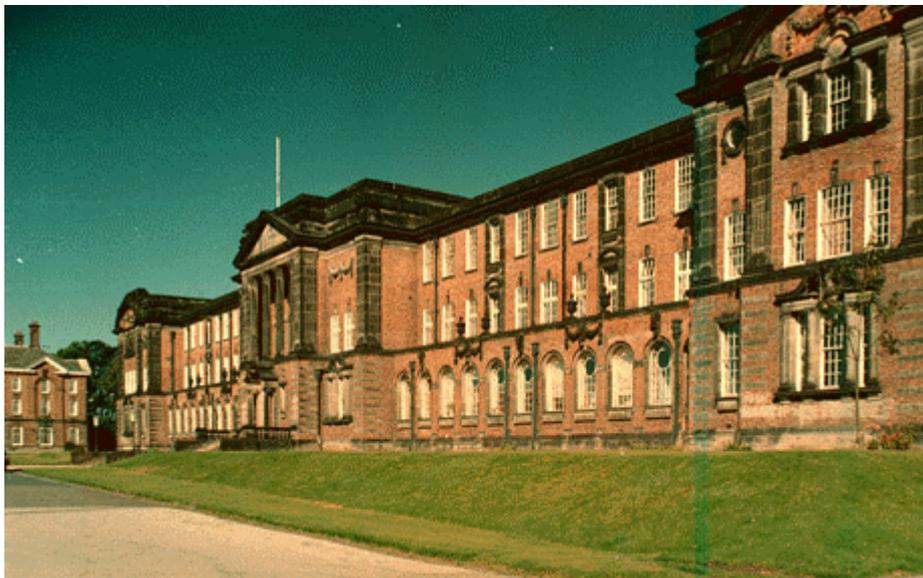
2 Preparation and Construction

2.1 BACKGROUND

The [James Graham Building](#) was constructed in 1910 and was built with two interior courtyards. In the 1960s, the western courtyard was filled in at ground floor level to extend the site library. The eastern courtyard was retained and landscaped to create an ecological garden - both for its aesthetics and for its use as a research resource.

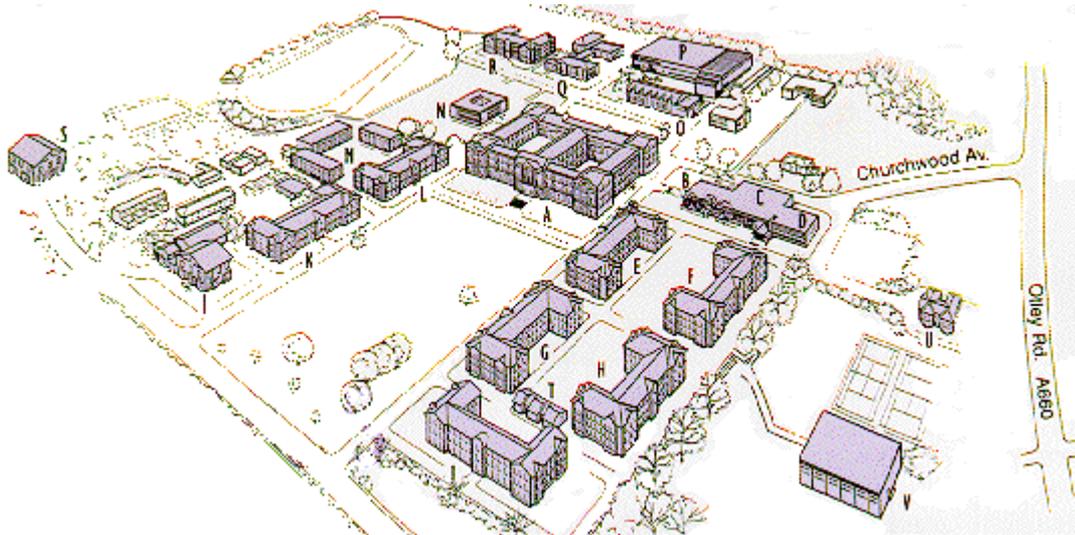


This eastern courtyard was identified as the only suitable space for conversion into a lecture theatre 'complex'. Luckily, by this time, the academic department that had used the garden had moved to another site and no longer required this resource.



The University had some experience at building lecture theatres as some had been provided a few years previously at the city centre site.

BECKETT PARK CAMPUS



The James Graham building is located in the centre labeled A.

2.2 CONSULTATION

Experience with building the three new lecture theatres on the city campus had made it clear that it was necessary to plan the technology support at the earliest possible stage. The University had, within its Learning Support Services Division, expertise and experience at handling major audio-visual installations - though this particular project taxed that experience to the limit, because of its unique factors.

Project Partners

The project involved a partnership between the University [Estates Division](#), Learning Support Services, the [architects](#) (email link), the city planners, the funding bodies and a [commercial AV provider](#) with the Estates Division forming the prime link between the external design team and 'the University'.

CONSULTATION WITH THE LOCAL AUTHORITY

At the time of design, the building was not listed (though it has been since). However, both to satisfy the planners rightful concerns and our own sense of architectural integrity, the work was not to be visible from the exterior of the building. The final scheme involved extensive consultation with the local authority in terms of how it affected the existing building and how much of the original architectural features could be retained. (Those who see the final result are normally quite impressed!)

Means of Escape

Naturally, a major concern of the project was that of means of escape. The lecture theatres were to be designed to seat a large number of students - but, in the worst possible case, the same number could be waiting 'outside' ready for the next 'changeover'. This was without the occupants of the other rooms surrounding the quadrangle and in the adjacent Learning Centre.

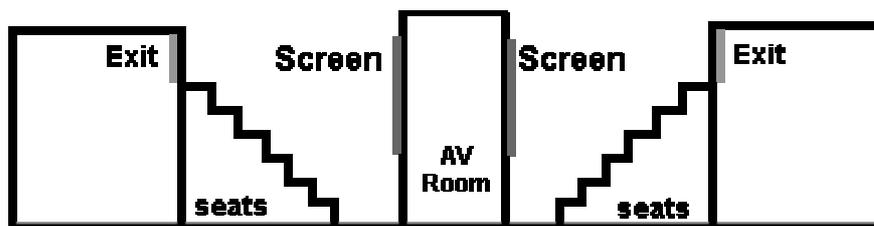
We knew that the circulation and safety of such large numbers was a difficult logistical problem to solve, and this also involved a lot of meetings with the local authority building control officers and the fire safety officer.

2.3 PLANNING

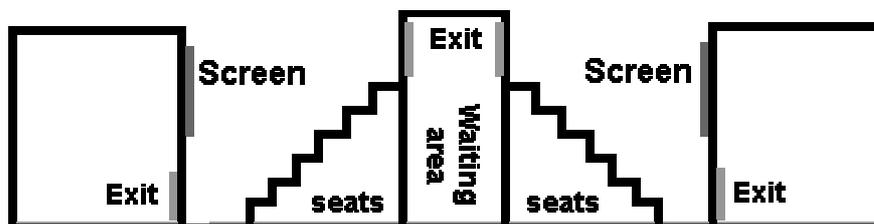
As ever, we started by thinking BIG - in terms of the student numbers we wanted to support. Our initial number of seats would have resulted in two storey lecture theatres and this proved to be both a technical and financial non-starter. As ever, we soon moved to a pragmatic, and affordable, single storey solution.

Planning- the support technology

From the start the intention was to provide a high level of technology within the lecture theatres - especially in terms of audio-visual facilities and computer networking. To support this technology, the first designs had a central 'core' for technical services.



Unfortunately, in terms of making the best use of available space - and coping with the very high circulation numbers - this did not prove to be practical. The concentration of equipment was also considered to increase the risk of fire.



This cross-section shows the final solution - a raised gallery in the centre which forms a waiting area in which students can congregate before the lectures. After lectures, students exit at ground floor level. Those awaiting the next lecture then filter in from the top. This 'one-way system' ensures rapid change-overs between lectures and maximises teaching time.

For external access to the building and to help improve circulation, a separate, dedicated entrance was created on the eastern side of the James Graham Building.

This solution to the circulation problem of course, causes problems for the [technical services](#). The central raised gallery means that the projection/support rooms are situated at the periphery of the complex. Since the entire complex is supported by only one full-time technician, this is less than ideal.

Planning - Audio-Visual Support Careful research was carried out to ensure that the main screens for lecture presentations were large enough to ensure legibility over a whole range of projected images.

We re-inforced this research with some practical tests of our own - we had to ensure our large investment would really work. Tests were carried out with a variety of projectors in existing theatres to determine suitable screen sizes. (One simple test involved the projection of an 80x40 character display being adjusted until it became legible from the 'back' of the theatre.)

As a result, we arrived at designs for the 'front of house' - the white-boards, projection screens and OHP screens.

The restrictions imposed by the confined area of the quadrangle meant that all of the lecture theatres had to be the same depth. This meant that capacities (designed in the range 90 to 230) had to be arranged by varying widths. In a less constrained design, the width and depth may vary, so in smaller theatres the back rows is usually not as far away from the screen as in a larger theatre. Thus the size of the screen could be smaller and cost less.

Part of the research (and subsequent tendering) process was to find a supplier that could fill the required screen size within the depth constraints. Presentation Projects in Maidenhead produced



a suitable system using large, front-silvered mirrors to bend the light path to increase distance and enable the image to fill the screen. Image quality loss in projecting the image onto the (very high quality) mirror, and reflecting it onto the screen is negligible - an effective, but expensive solution.

The same space constraints that resulted in variable width theatres also imposed restrictions on the space available for the projection/support rooms. This meant that to keep the numbers of seats as high as possible, there remained only a maximum of 2.1 metres available between the back-

projection screen and the rear wall.

Each projection room had to be set up differently, to cope with architectural features such as pillars and doors. Where absolutely necessary, these were moved but for reasons of economy, where these could be accommodated, they were! Similarly, in some projection rooms the projection equipment had to be positioned at an 'unnatural' height. Fortunately most technical adjustments to the video projector can be made by remote control.

Planning- Financial restrictions

No-one will be surprised to hear that the funding available at the time meant that some compromises had to be made in equipping the theatres. It was decided that only two theatres would initially be equipped with ALL the intended rear projection equipment to the highest specification levels; the three remaining theatres would be provided with a base level but would have the infrastructure necessary to allow for upgrading at a later stage. (Since the complex was opened, one of these theatres has been upgraded.)

Planning- Access for people with disabilities

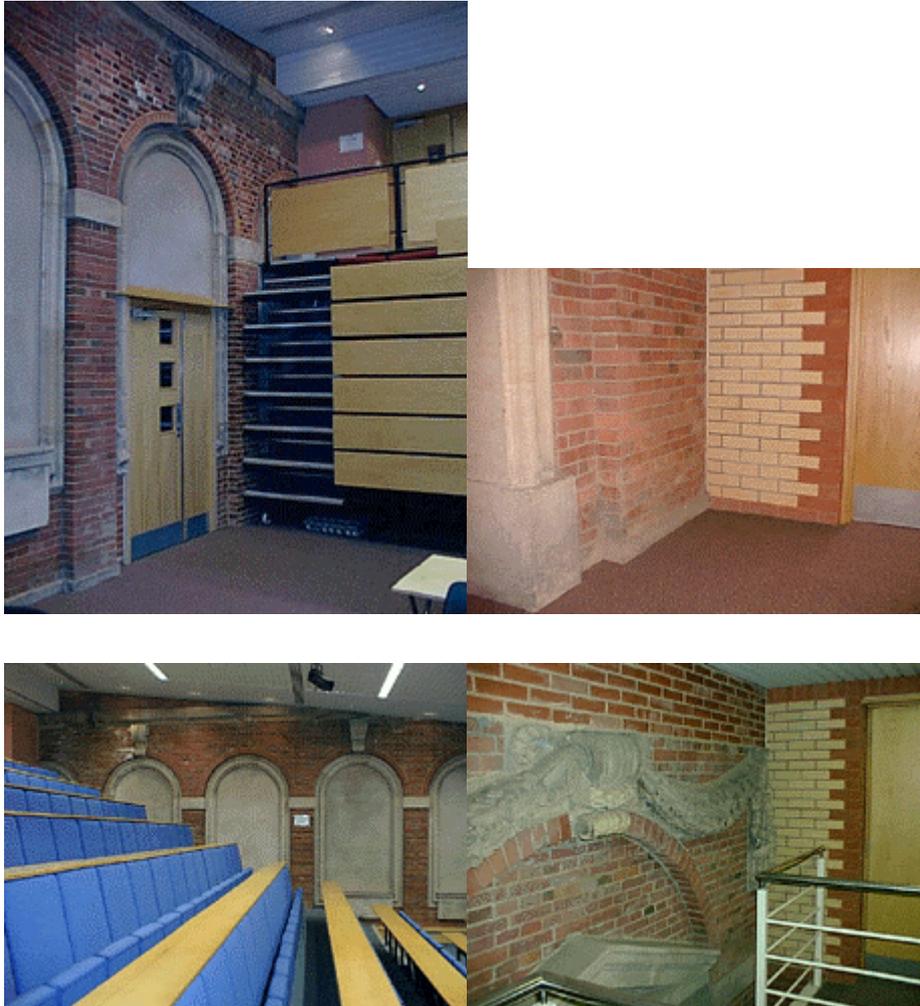
The University takes seriously its responsibilities to people with disabilities. The eastern entrance to the building, dedicated to the lecture theatres, was designed with an entrance ramp. This was particularly important since the main entrance to the James Graham Building has a number of steps.

The ramp gives good access to the whole building and has parking facilities close by. New toilet facilities for people with disabilities were incorporated in the scheme. It would be extremely difficult to provide wheelchair access to the raised gallery for wheelchair users to gain entry from the top of the theatre (and this would provide internal difficulties) and so dedicated wheelchair positions were planned on the first row at ground floor level with access through the normal 'exit' doors.

2.4 DESIGNING

Designing- Preserving the James Graham Building

One of the most positive aspects of the project was that significant additional space was provided within an existing building, and that, in the process, almost all the main architectural features were retained. In fact, many of the main features have been positively incorporated into the lecture theatres.



Designing- a user-friendly environment

The theatres were designed to counteract the intimidating effect of being in a large room, sometimes with over 200 people. The spaces were designed to be as natural as possible, and to appear as 'low-tech' as possible. They are aesthetically very clean and the front row of seats is very close to the lecturer. This was deliberate to create a sense of being part of the event that is taking place rather than merely observing a lecturer grappling with complex equipment.

Designing- Aesthetics



The use of colour was an important aspect of the design, as the theatres are large spaces that must function in such a way that the occupants are focused on the lecture or presentation. The basic colour scheme was taken from the weathered brickwork of the existing building. The material for the seating (type of material and colour) was also chosen to reflect the warmth of these existing walls.

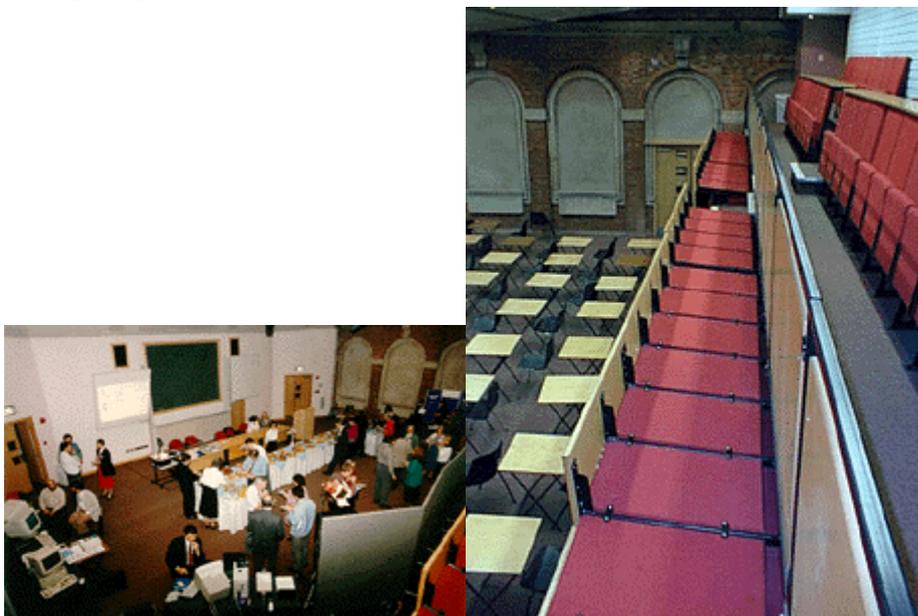
Designing- Ventilation

Ventilation handling plant is important in creating an effective learning environment. The area above the gallery was extended upwards to house the plant room. This formed an economical solution. Centrally located, it is a very efficient way of housing all the air handling plant, which filters and regularly changes the air. As there are no outside walls to the lecture theatres, running costs are low. A particular feature is that from the control panel within the theatre, the lecturer, upon seeing a flagging audience, can hit a button to give a 'fresh air boost' and revive them!

Designing- Sound insulation

Since the complex can be compared to a multiscreen cinema complex, adequate sound insulation between the theatres was an important design criterion.

Designing- Flexibility



As part of the scheme, a flexible space was required, which could be used not only for lectures, but also for exhibitions (and even examinations!). One of the lecture theatres (the imaginatively-named Lecture Theatre B) which normally seats 250 people was furnished with retractable seating, which provides this multi-purpose space. (When retracted, the writing surfaces in front of the seating form a wooden fascia on the back wall.)

This open space has since been used for a variety of events such as exhibitions, buffets, examinations and 'functions'. This facility greatly increases the appeal to outside organisations that are now regular users of the complex. The seats also part-retract, so that a suitable space can be created for 'theatrical performances'. Of course, this arrangement also has its [disadvantages](#).

Retractable seating can cause its own problems in terms of means of escape and access. Research was carried out in other institutions to find a product that was easy to use (to retract) but was also stable, robust and quiet (non-creaking).

2.5 CONSULTATION – AGAIN

The final configuration of the whole complex and the individual lecture theatres was developed in consultation with the Deans of Faculties, and the designs/sketches were approved by the University's Academic Board.

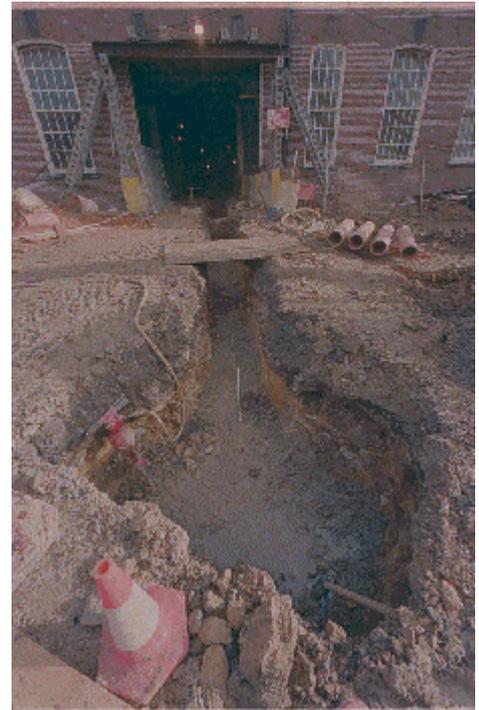
Such a process is thorough but not rapid. Tender specifications were based on function rather than make and model of equipment to avoid 'obsolescence'.

2.6 THE BUILDING WORK (Building within a LEARNING ENVIRONMENT)



Building work had to be carried out in such a way that there was minimum disruption to the university. During the construction it was, as far as possible, 'business as usual' and elaborate precautions were made to keep noise and dust away from students and staff.

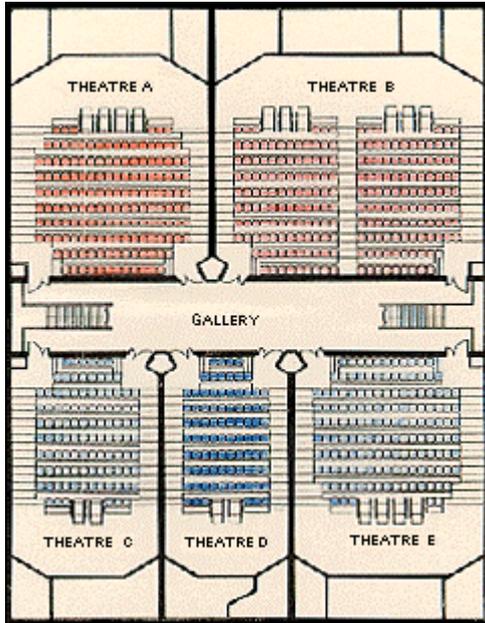
The major logistical problem was bringing in materials and heavy plant where an existing building encircled the entire site - which remained occupied by students. The contractors were given strict guidelines about levels of noise at particular times of day and the week. They were required, as part of the specification, to use noise suppression devices. To facilitate access to 'the site', the ground floor eastern entrance became part of the works, and a hole in the wall large enough for most plant was created with access via a temporary ramp. Most materials could be brought through that entrance, but all the steel work and roofing sheets, and the bigger plant had to be lifted over the top by a large crane. For reasons of health and safety, this could only be carried out between the hours of 8pm and 8am.



3 Technical Specification

3.1 WHAT DO WE HAVE AS A RESULT? – The AV in detail

The five lecture theatres offer a total of 746 seats in various configurations :



Lecture theatre A: seating 164

Lecture theatre B: seating 230

Lecture theatre C seating 108

Lecture theatre D: seating 90

Lecture theatre E: seating 154

Within the fully specified theatres (B, C, and E), AV/IT provision consists of:

Lecturer control

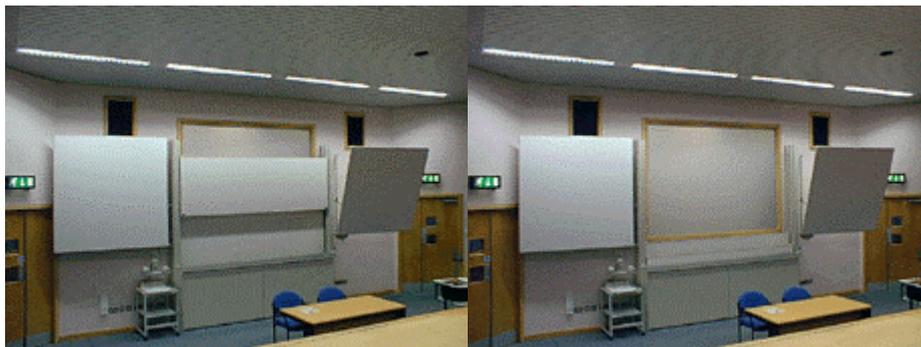
There are two identical control panels to enable the lecture to be conducted in as flexible way as possible. One is located in the lectern, the other in a front-of-house desk. The control panel shows with an LED, which function is selected. In addition there is an infra red remote control device to control PC and video projection which can be used by more dynamic, wandering lecturers. This is used in conjunction with a radio microphone. (Since the theatres have been in use, this remote control operation has been equally as popular as the fixed option.)



In the projection/support room, there is yet another duplicate of the main control panel (so a lecturer's wrong decision, or hesitation, in pressing the appropriate button can be overridden by the technician if necessary).

Guillotine magnetic whiteboard

When the theatres first opened, many staff relied on simple OHP and whiteboard presentations. However, many lectures are now PC-based with the OHP and the white boards used as a supplement to a PC presentation. The (dry-marker) white boards are also magnetic to add additional flexibility.



White board in the up and down positions

OHP screen and slide projection screen

The OHP screens are solid and are designed to tilt and swivel - to provide images, which are not distorted. The power output points for the OHPs were carefully located, to encourage positioning of the projector in the correct place to enable the screen is filled with the image. Brightness of the image is ensured by using 400w OHPs.

There are two OHP screens that form 'ears' at the front of the theatre - one on the left, and one on the right of the whiteboards. This is to cater for lecturers who are left or right handed, who can choose the side of the theatre they prefer to present from. The lectern can also be transferred to the 'other' side of the theatre and plugged in.

In the rear projection theatres, 35mm slide projectors are housed in the projection room alongside the video/data projector and use the same mirror, and the same projection surface as the data and video projector, so the image quality of



transparencies benefits from the same high quality projection.

In theatres A and D (unfortunately, not yet fully configured), which don't have built in rear projection, there is a central screen, but projection equipment must be positioned in the body of the theatre.

Lectern and microphones

The specification for the lectern microphones demanded a good resistance to table noise and a broad pick up range, in order to pick up the voice of (ill-disciplined!) lecturers who happen to move off centre whilst they are talking.

Voice reinforcement system

This ensures that the lecturer's voice is audible, and that the induction loop system is operating. The voice reinforcement system is switched on at all time. This helps the lecturer sound as natural as possible, in keeping with the concept of concealing as much technology as possible.

'Graded' speakers were installed in the ceiling (unlike in a simple public address system) to add more volume at the back than at the front, creating a balanced sound throughout the theatre.

The architects contributed to the required 'natural' audio effect by acoustically modelling the space, to minimise sound reflections. This is most noticeable in the gentle curve of the wall above the back row up to the ceiling.

Tie clip radio microphones

Provision was made for lecturers who find it very difficult to remain 'pinned' to a lectern, and prefer to pace around. Radio-microphones can be used in conjunction with the remote control panel.

Sound system for video and PC audio

This system is totally separate from the voice reinforcement system and is a more conventional public address system. (The video sound source must be as close to the pictures as possible, so that lip-synchronisation is achieved. Therefore, speakers are located to the left and the right of the screen.)

For security reason, mock speaker cases are positioned in front of secure boxes, which contain the real ones.

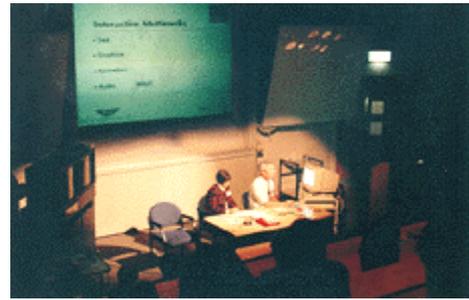
Induction loop system for hearing impaired

Loop systems work through a copper wire running round the room, through which an electric current is fed, creating a magnetic field. That magnetic field is there irrespective of walls and barriers between theatres. The system was designed very carefully, in consultation with a loop designer, to prevent magnetic information travelling from one theatre to another, in the same way as audible sound is transferred.

In theatre B (the one with retractable seats), there are two loops installed. One loop in the floor for when the seats are 'in situ', and one in the wall for when the seats are retracted. The metal framing of the seats shields the user from the magnetic signal coming from the floor, so that when all seats are in place only the induction loop from the wall is used. All loops are fed from both the Lectern microphone and the radio microphone.

Rear projection screen

In lecture theatres elsewhere where forward projection is used, video and data projectors are often suspended from the ceiling, at a set distance from the screen. Being 15-20 feet from the floor they are costly to maintain or adjust. Another feature of forward projection is that the areas of the image which need to be portrayed as black, can only ever be as black as allowed by the ambient light levels of the room. (In every lecture situation, a certain amount of ambient light is unavoidable.) This light reflects on the white surface of the screen reducing the contrast range, and therefore the quality of the image.



With rear projection facilities, this is reduced considerably by blacking the walls in the projection room, ensuring that all the lighting on the back of the screen is provided by the projector. This allows more ambient light in the lecture room without causing the same reduction in the image contrast range, ensuring that the lecturer can be more comfortably and intimately lit, without relying on unflattering under-lighting from the lectern light. In each theatre there are spotlights on the lecturer which are shuttered to stop light spilling over onto the screens. Adequate light can also be provided for the audience to take notes without difficulty. Providing an integrated set of services is much easier to achieve with rear projection. It also means that much of the technology can be hidden in the projection/support room out of sight of the audience.

Transparency projection

The slide projectors use the same mirror, and the same projection surface as the data and video projector, so the image quality of transparencies benefits from the same high quality projection.

The projectors are fitted with zoom lenses, so there is the option of completely filling the screen with a 35mm slide, providing a stunning high quality image.

VHS and S-VHS playback system controlled from Lectern or desk

If the lecturer intends to use video as part of their presentation, they provide the videotape to the technician before the lecture for loading in the video player. However, the lecturer retains full control over play, fast-forward, shuttle, etc from the control panel on the lectern or the table at the front of the theatre.

(Some institutions have a 'letter-box' in the wall of the theatre through which the lecturer can insert the video tape into a player. In our case, security of equipment won over access. This means that the tape cannot be loaded or changed by the lecturer – multiple videos must be compiled onto a single cassette.)

ISDN for video conferencing

At the planning stage, ISDN was seen as a means of 'future-proofing', along with the installation of telephone and data network points. The theatres were therefore designed with video conferencing in mind. The video projection equipment can be used to display the remote end of the video conference.

Linking theatres

At the moment two of the theatres (B and E) can be (simply) linked together. This means that large conferences can be accommodated, and the presentations can be displayed on the screen and questions

from the audience in both lecture theatres can be answered by the speaker situated in one of the lecture theatre - the answers obviously being heard in both theatres.

CRT projection from PC to Workstation resolutions

When the theatres were being designed, standard PC resolution was VGA (640x480 pixels). This has since been superseded by XGA and Super VGA. Anticipating such development, projectors were specified which were flexible enough to accommodate a variety of resolutions.

Multimedia PC

It was important to keep the connections from the PCs to the projection equipment simple. To avoid confusion and complication in setup during the stressful pre-lecture period, connection is by one single ten-pin connector into a floor or wall plate. Lecturers' individual laptops and other PCs can be used with the same connector.

Network socket

This allows lecturers to access files on a remote file-server (internal or external to the university). This is used significantly for WWW access.

Ceiling mounted video cameras to record lectures at the push of a button

One of the ways of expanding access to 'standard' lectures is to provide them on video. This can be time consuming and intrusive - as camera and cables (and cameraman) have to be set up within the theatre. This problem has been solved by having cameras built into the fabric of the theatre, resulting in a convenient system, whereby the lecturer can simply ask the technician to record a particular lecture, and the presence of the camera can almost be forgotten. Sound from student contributions within the audience can even be recorded through an array of nine flat, covert, white Pressure Zone Microphones in the ceiling.



There are two cameras, which can be moved around by remote control. One camera is set to a wide angle to give a wide scene-setting shot of the room, and the other a closer shot of the lecturer. The technician can operate a vision mixer to change between these cameras and also a third Visualiser overhead camera for showing close-ups of materials

Built in 'Visualiser'

This is an overhead camera, set aside specifically for showing models, leaflets, images from books etc rear projected in the same way as data and video. This camera is fixed over the desk, and can be zoomed in to show detail.

Call Technician intercom system

The AV technician is contactable by the 'Call Technician' system (based on nurse-call systems), which is situated at the front of house, in the body of the theatre, and has links to every projection room and the technician workshop.

Indicator lamps are installed outside each theatre which attract the attention of the technician even if in the corridor.



4 Learning Environment in Use



4.1 TIMETABLING

The theatres are allocated to Faculties on the basis of their fte student numbers. A number of slots (essentially evenings and weekends) are kept free for other users. Three faculties primarily use the facility: Information & Engineering Studies, Cultural and Education Studies and Leeds Business School. Each faculty has a coordinator who is responsible for their timetabling. The faculties are then able to sublet time in the schedule to other departments.

Lectures are intended to finish five minutes before the hour with the next one starting at five past - this gives technical staff time to prepare.

4.2 SUPPORT STAFF

The lecture theatre complex is presently supported by one AV technician working on a 'buddy' or 'pairing' system in case of absences, (leave or sickness). Other AV technicians have been trained and are nominated as 1st and 2nd backup for such eventuality.

The technician's main job is to provide support to lecturers who are using the technology available. Background tasks include the general maintenance of equipment and the theatres themselves, contacting external contractors for repair work which cannot be carried out internally. The AV equipment is the subject of a technical service telephone line and a maintenance contract (giving on-site service within 24 hours).

4.3 TRAINING

The firm that installed the equipment ran a training course for technical staff. Learning Support Services organised 'walk-in' training days for teaching staff. Staff valued the opportunity to experiment with the equipment in an empty theatre - especially as many lecturers were rather intimidated by the control panels.

For those staff who missed this 'walk-in' training, and for new staff, the technician offered (and continues to offer) a conducted tour to show them the facilities and help them to gain confidence with the operation of the equipment. The majority of staff, once familiar with the equipment, are very keen to use it.

In addition to the specific training related to the use of the theatres, the university runs courses on software, presentation techniques, and sources of electronic information. (In addition there is a comprehensive set of support material in the library).

4.4 USAGE

% use of Equipment for January 1998

Theatre	OHP	Whiteboard	Sound Re.	Video Projection	Data Projection
A	80	90	40	NA	NA
B	95	80	60	35	60
C	95	80	30	20	65
D	90	80	25	NA	NA
E	90	90	60	40	85

4.5 USER FEEDBACK

User feedback AV/IT

Perhaps surprisingly, staff normally use the equipment in the way that was intended (though there have been some developments that reflect wider advances in presentation techniques). The fact that most lecturers now use a PC has created an increase in demand for IT facilities. When the theatres first opened, there was one PC moved around all 5 theatres. This has increased to 4 used extensively for PC based teaching, access to the Internet and for video conferencing.

(Very few people use 35mm transparencies, unless the subject specifically requires the highest image quality available - such as architecture and medical courses).

Most people use Microsoft PowerPoint, with a few using Toolbook. The specific requirements and specialties of different faculties are reflected in the usage of the theatres. The faculty of Information & Engineering Studies tends to be at the forefront of the use of technology in presentations, and staff use 'true' multimedia presentations very regularly.

Easy access to a variety of presentation techniques has encouraged staff to use them - and presentation styles have varied and improved significantly. (Many staff have spoken of a sharp rise in ratings for their lectures when they began to use the new theatres!)

4.6 BOUQUETS & BRICKBATS

The following quotes from staff reflect real satisfaction and occasional frustration :

"It was great to find myself no longer handwriting OHP slides, or even photocopying them onto acetate. I could go with a floppy disc in my back pocket and do the presentation. Now I don't even need a floppy disc, because I can attach to the network and retrieve all my material."

"Its a waste of a resource just to give slick looking PowerPoint presentations. It could and should, be used more for video conferencing, and for networking between lecture theatres to lecture to large numbers".

"It encourages people to use technology if it is already there and set up"

"I'm using it slightly less than I used to. The problems I've had are that I'm not particularly technical, and when you're going to give a lecture, you're inevitably a little bit hyped up anyway, and so if you're also having to deal with equipment, then sometimes you gauge it wrongly."

"It wasn't so much using the software, we were already familiar with that, it was the specifics of what the theatres will do. Like getting the right light button. Even now, you can hit the wrong light button - the students like that!"

"So I think that my plea is that the machinery should be the same in every room, for the benefit of those less confident with equipment. My plea is for consistency even down to the laptops"

"Since installation most lecturers have found the intercom system indispensable - although some staff still prefer to go and find the technician in person."

"One drawback is that demands for assistance tend to come 'on the hour' when there is a changeover in every theatre. This means that the technician is stretched during the time that their service is required most."

"I have used the intercom in the past, not regularly, but when you've got 200 students waiting for a lecture, then it's significant. It doesn't happen often but it's so important to have that facility. I suppose it would be better if the button was on the desk. I always say, 'Big Mac and fries please.'"

"You pressed one button, and several things happened at once. That took a bit of believing, but once they got used to the fact that it did happen, then they became very confident in it."

"It's good that the PC just does plug in, and then literally one button brings the screen on. And also when you finish, one button turns it all off again".

User feedback Design and architecture

"It's a comfortable area for students, much better than packing them in."

"The way the lecture theatres are structured does not really lend themselves to student interaction or small group sessions. In the course of the standard lecture, for example you might want to just put a problem up, and let students talk among themselves, for five or ten minutes and then reconvene. The lecture theatres do not really facilitate this kind of flexibility in teaching."

"Partly due to the timetabling system- if you want to chat with the students afterwards to pick up any questions, it's out in the corridor. What would be good is an area, like a seminar room. which could be an overspill for 15 minutes after the lecture. "

"The students do enjoy it. I think it could be a good aid to learning. I think a course could be run for those of us have been using it at one level, to bring us up to another level of using it."

"I think it's very good that all the technology is hidden and unobtrusive, it's as transparent to the user as possible."

The circulation which was an important aspect of the design- enter from the back- leave through the front is not always adhered to. Students instinctively go out the same way as they came in. This creates a significant health and safety problem unless clear signage and reminders from staff are in place. The stairs along the rake are clearly not designed to be wide enough for students going up and down at the same time.

"Even at the front row you're not craning your neck to look at the screen. And there's enough writing room, they're not cramped up."

"You can lead lectures in an ideal space. There is no comparison between that and the other teaching rooms in the university."

User feedback- External clients

"We've got the advanced motorists, and the RAC coming up in the next few weekends, and they are people who've used it a lot before and they are well pleased with it. There are also large medical conferences held in the summer"

User feedback- Porters and cleaning staff

It takes three porters about forty minutes to pull out/ push in the retractable seats. From the point of view of staff time, this is quite a costly exercise. An electrically operated device could have shortened the process considerably.

The design of the theatre seating seems to have created a situation where students can conceal and leave behind litter in the rows, eating and drinking in the lecture rooms, despite signs prohibiting this. This causes mounting debris in the theatre, as there is no timetabled cleaning between lectures. Therefore, every effort has been made to deter users from leaving behind litter.

One issue is of over-crowding. Porters have been asked for extra chairs when a theatre has been booked which is too small for the audience. Extra loose seating would be a contravention of the health and safety regulations.