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Post-Occupation Evaluation Study Report

Teaching and Learning Building

March 2020

BUILDING UNDERSTANDING

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INTRODUCTION

This report aims to detail the strengths and the weaknesses of the Teaching and Learning Building development. It will put forward recommendations and highlight best practice and excellence that can be applied to future projects at the University of Nottingham.

OBJECTIVES AND METHODOLOGY

OBJECTIVES OF THIS POST-OCCUPATION EVALUATION

- To bring to light any key issues associated with the operation and management of the project during all phases of the development process
- To draw out stakeholder feedback concerning the design of the building and the experience of those who use the facility
- To facilitate a half-day workshop, to discuss and debate the key issues revealed through the primary research
- To analyse all output from the face-to-face depth interviews, telephone interviews, end user satisfaction survey and the workshop to provide a summary report with recommendations

SCOPE OF THE STUDY

Building Understanding sought feedback on the following aspects of the Teaching and Learning Building development:

- Overall satisfaction with the facility
- Design
- Construction
- Security
- Accessibility
- Lighting conditions: natural and artificial
- Data connectivity
- Operations and facilities issues

STUDY PARTICIPANTS AND METHODOLOGIES

The methodologies used in this evaluation are detailed below:

Face-to-face depth interviews with stakeholders

The study included depth face-to-face interviews of approximately one hour's duration with the following stakeholders:

- The capital projects manager
- The architect
- The project manager
- The contractor

Telephone interviews with stakeholders

Telephone interviews were conducted with individuals in the following roles:

Estates Office staff

- Senior engineer

- Domestic Services general manager

Consultants

- Three members of the consultant team

Key stakeholders

- Three key stakeholders involved in the development and ongoing use of the building

User satisfaction study

Researchers spent two days in the Teaching and Learning Building distributing questionnaires to building users. Questionnaires were completed by 521 building users over a period of two days. Respondents were drawn from the following groups: students (498 responses), academic staff (16 responses), non-academic staff (5 responses) and members of the public (2 responses).

The workshop

On 24th February 2020, a workshop took place involving 7 attendees from the various stakeholder groups. The workshop objectives were to:

- Discuss and debate the findings of the primary research
- Generate recommendations to be applied to future projects commissioned by the University of Nottingham
- Highlight nuggets of best practice and excellence revealed in the project that can be adopted and applied elsewhere.

The workshop commenced with a presentation, by Building Understanding, of the findings of the primary research. Attendees were then divided into breakout groups, with each group charged with assigning recommendations to specific points of feedback.

SAMPLE SIZES

It is important to emphasise that much of the quantitative statistics around the preconstruction, construction and post construction phases of the development of the building itself are based on very small samples with feedback gathered from a total of 12 respondents.

Feedback from the large-scale user satisfaction study focuses primarily on the building in operation from a user's perspective.

QUALITATIVE FEEDBACK

Quantitative satisfaction ratings were collected during the face-to-face, telephone interviews and the user satisfaction study. Respondents were asked to rate their satisfaction with various aspects of the project on a scale of 'zero' to 'ten', where 'one' represents 'very poor' and 'ten' represents 'excellent'.

Bar charts displaying the percentage split by rating are shown in the relevant areas of the report. It is very important to emphasise that for the stakeholder feedback concerning some elements of the project, such as those relating to preconstruction, construction and post

construction phases, quantitative results are drawn from very small samples and are therefore not statistically significant. Some respondents were only involved with specific aspects of the work and so their responses are limited to only that area. However, these results show at a glance the range of levels of satisfaction with the Teaching and Learning Building, with scores ranging from ‘two’ to ‘ten’.

PROJECT DATA

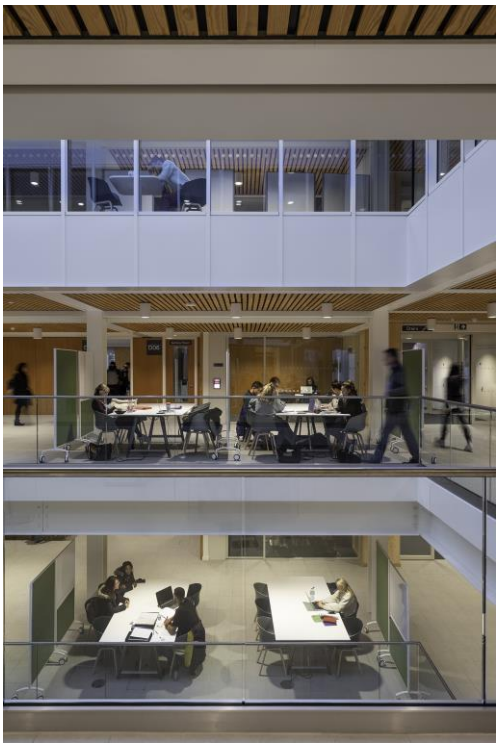
Name of facility:	**Teaching and Learning Building**
Location:	University Park, University of Nottingham
Gross area:	6282m^2
Number of storeys:	Five
Users of the facility:	• Students • Staff • Conferencing
Room types:	Study spaces, collaborative lecture theatre, seminar rooms, auditorium, performing arts space, meeting rooms, interactive teaching rooms
Start on site:	12 August, 2016
Date completed:	21 August 2018
Period on site:	106 weeks
Gross construction cost:	£23m
Funding:	University funding, with some HEFCE grants
Contract type:	JCT 2011 D&B contract

PROJECT BACKGROUND

Completed in August 2018, the Teaching and Learning Building (TLB), provides a hub both for study and teaching, on the University Park Campus.

The building was born out of a desire to enhance the experience of Nottingham University students, and to align with the University's Strategy 2020; the University's ambition for "Excellence in Education and student life". Central to this ambition is a learning environment that provides the opportunity for students to socialise, is in proximity to the library, as well as having teaching and learning spaces closely aligned. Other changes to existing spaces on campus, such as the refurbishment of the Portland Building, meant that there was a shortfall in teaching spaces on the University Park Campus. This project aimed to bring together teaching spaces and bridge this gap by creating a flagship, flexible well-designed space that is conducive to teaching, learning and study.

Aiming to be a beacon for modern learning practices, the 6282m2 facility includes a collaborative 300 seat lecture theatre, a performing arts space, teaching rooms of a variety of sizes, a social learning hub and individual study spaces. The building is designed to be in use for all year-round activities including revision, assessment periods, conferences and events.



THE BIG PICTURE

Overall, it is clear that the Teaching and Learning Building is a great success. The building is well used and highly regarded by the students, for whom it was designed, as well as by academic and non-academic staff members. The building provides a wealth of study spaces. Its quiet, light and bright atmosphere makes the building conducive to quiet study and seminar rooms and lecture theatres provide the facilities that the University needs.

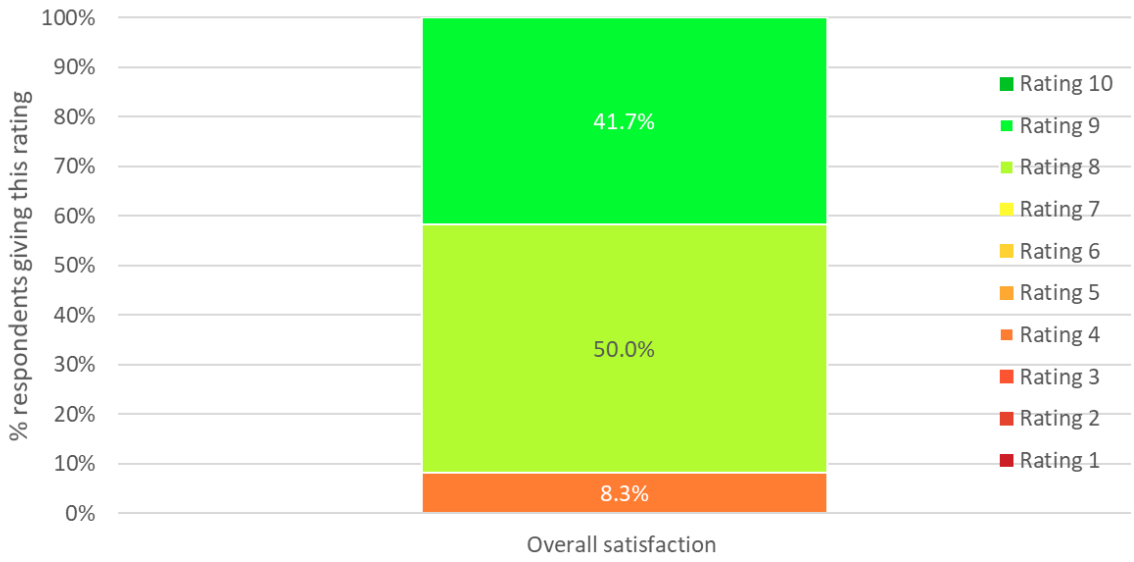
The stakeholders who were interviewed all feel that the Teaching and Learning Building achieved the University's vision, which was to "create an inspiring building which is a clear statement of excellence in education". Most respondents were satisfied with the building overall; the facilities it provides were highly valued and the popularity of the space was highlighted. The building has won three awards: The RIBA Regional (East Midlands) Award, The RIBA Sustainability Award and the RIBA National Award.

When asked about the most successful elements of the journey through the building's development, stakeholder engagement was a notable success. Respondents noted how the right people from across the University were consulted on the project, in order to ensure that it met the needs of those who would be using it the most, while ensuring that the original vision for the building was at the heart of the finished project.

Feedback from the large-scale user satisfaction study echoed this view, with students overwhelmingly positive about the experience of using the Teaching and Learning Building. Among those canvassed, there was an average satisfaction rating of 8.6; 'mostly satisfied'. Building users find the space conducive to study, and value it highly as a place to work and learn. Suggestions for improvement, focused on expanding the capacity in the building such as increasing the number of workstations, and providing a café.

However, the project was not without challenges. Most notably, delivery of the finished building was around eight months late. For key stakeholders within the process, there were communication issues between certain members of the project team and at times it was felt that there was a lack of a collaborative approach. Some elements of the original design were slightly 'watered down' or amended, in order to meet the target budget.

Fig 1: Overall satisfaction with the Teaching and Learning Building among key project stakeholders



QUALITATIVE FEEDBACK - THE DESIGN AND THE CONSTRUCTION PHASE

FEEDBACK RELATING TO THE BUDGET

Budget

According to one respondent, "*There was a cost issue for the project, pretty much for the entirety of its life so there were a series of value engineering exercises.*" Another interviewee noted that; "*The project had to navigate economic turbulence. That project is not alone on that.*" However, there was a sense from some respondents that the full implications of those decisions on the overall build programme, and any knock-on issues they might create, were not properly assessed at this stage. The workshop attendees noted that this was in fact a cost-cutting exercise, rather than true value engineering (V.E.)

One example of a decision made without a full appreciation of its implications was the replacement of the original raised floor, housing power and data, with screed. The effect this had on the weight of the overall structure had a significant impact on the amount of design time required to absorb this change and a subsequent effect on the programme.

"While the screed and the floor trunking has worked, I'm sure had we known what we known we would have approached that slightly differently. Or the saving that it generated might not have been the same number because of the difficulties it caused."

Other stakeholders felt that some of the more aspirational elements of the design approach were diluted and that environmental performance suffered as a result of this V.E. process. Innovative sustainable elements of the original design were removed such as a gas-fired heat pump. While building users wouldn't necessarily notice these, one interviewee noted*; "It could have been a more environmentally conscious result if we hadn't suffered those reductions."*

Recommendations:

- Acknowledge the need for honesty in each V.E. item. Assess whether this is truly V.E., or is it actually cost reduction?
- The implications of any V.E. items should be fully discussed and appreciated.
- The University to continue to adopt a more fluid budget on build projects, aligning the budget as the design progresses so that there is less of a disparity when it comes to a V.E. exercise, therefore, hopefully, less of a need.
- Explore the possibility of practical, collaborative workshops for V.E. programme management, with timelines. These would include discussions as to what implications of V.E. changes may be.
- Avoid changing any of the core consultant team halfway through the project, as this had a negative impact when important knowledge was lost.

FEEDBACK RELATED TO PROCUREMENT

This project was undertaken using a Design and Build Contract and a number of respondents questioned the use of this form of contract.

With the one-stage tender Design and Build (D&B) model, the University commissions the architect to develop the design, but then, on appointment, the architect is novated over to work for the contractor rather than the customer. This type of contract helps mitigate some of the risk to the University. This, for a number of respondents, was at the heart of the issues with this project. The architect feels that they were "*kept at arm's length*" by the contractor once the subcontractors had been appointed. They suggested one way to mitigate this in future projects would be to take the design to RIBA stage four, technical design, after which the contractor would be appointed.

Another respondent noted how 'jarring' the shift in emphasis is, part-way through the process, under this kind of contract. They noted; *"I think that the client, design team, construction team needs to be a much better integrated and aligned group of people, It's about people at the end of the day. There needs to be a bit more trust in the design team to deliver a properly coordinated, fully detailed design that can be the basis of a more traditional tender."*

One respondent noted in their response to the question about what they would do differently if they could turn back the clock, that they would *"like the University to review the way it procures buildings, rather than the single stage tender D&B model."* Another interviewee drew on their experience on other projects where a proportion of the design team was retained on the client side as a design monitoring and checking service. This respondent feels that any additional costs associated with this method were offset by a better end result for the project overall. Reflecting on some of the challenges on this project one University respondent noted that in retrospect, they would have retained the architect on the client side as an overseeing and checking architect working on their behalf, as this process has been used on other University projects successfully.

Recommendation:

- Review whether this form of procurement provides the best long-term value for the University

FEEDBACK RELATED TO THE DESIGN AND LAYOUT

The design

The overall design

A key element of the design of the building was that future adaptability has been built into it from the outset. By creating a series of 18 metre by 9 metre column-free spaces, the structural engineers created large volume areas that could be adapted going forward as University requirements shifted. The design, seen as innovative by a number of

respondents, also means that there are no structures in the way and the space maintains the light and airy feel that it set out to achieve. The building was seen as unusual in this regard by one respondent.

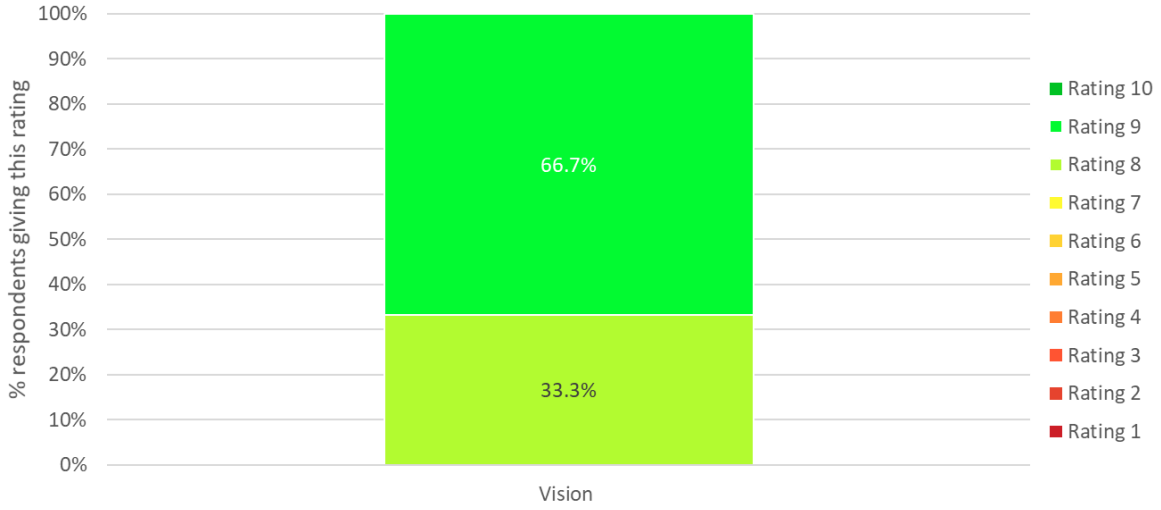
Elements of the M&E design were viewed as innovative by some respondents as the natural light and ventilation means that there are no overt M&E fixtures, making it almost 'invisible' through the design.

During the design period, a planned staircase through the central atrium area had to be removed because of design changes required to achieve planning permission. At a late stage, at the request of the Project Management Group (PMG), this was reinstated, and a separate contractor appointed to complete this. This over-ran the end of the build and altered the look and feel of the atrium area.

One respondent noted their pride in the way that elements of the design have been implemented; *"I think the way everything has been coordinated. Each element of floor tiling and the stack bonded blockwork the way it all marries in with the timber panelling. The ceiling panels and the setting out of those within the steelwork. The steelwork is massive, and I know that was part of the design intent of having a chunky frame."*

In terms of meeting original the vision, all respondents agreed that the Teaching and Learning Building has succeeded, rating this question either 'eight' or 'nine'. One respondent noted; *"In terms of meeting the vision of what it delivers for the University, it's massive. It really has become a significant part of the campus. It certainly provides everything we wanted it to provide and probably more."*

Fig 2 Overall satisfaction with how closely the TLB meets the project's original vision



Lecture theatres and seminar rooms

The lecture theatre is an area where there is a difference of opinion amongst the study participants. There had been discussions around a flexible and collaborative lecture theatre, however, the demand for capacity meant this was not delivered.

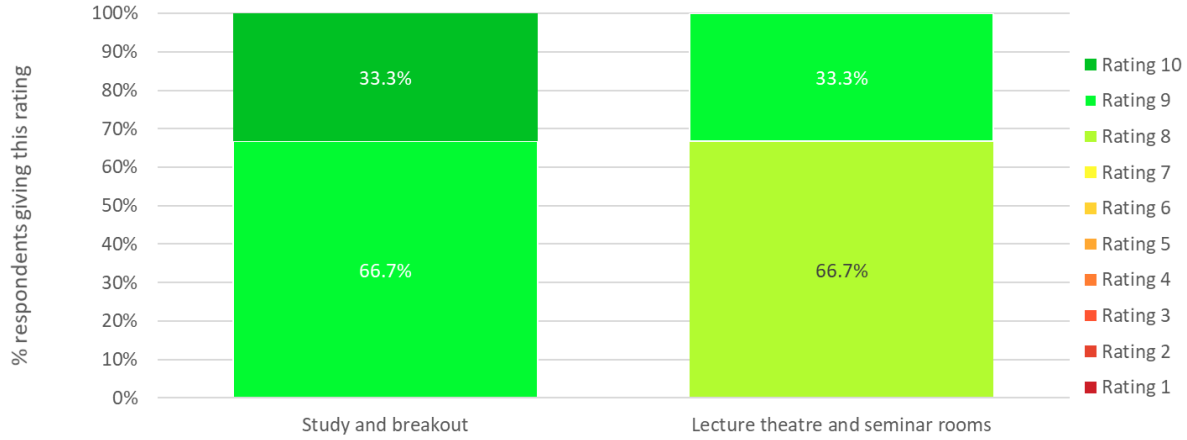
The Timetabling team had requested a larger lecture theatre, to hold 500 students, however, the lecture theatre now accommodates 300 and at times the theatre feels cramped, which to some seems at odds with the open and airy feel of the rest of the building. *"The tight space in the lecture theatre knocks everything out of whack. It's a massively spacious lovely*

building, where it's all flexible and all fantastic and then you squeeze into the lecture theatre." One respondent noted that windows that could be blacked out could have been a benefit in the lecture theatre. It is clear that there were differences of opinion about what the most successful lecture theatre would look like among University stakeholders. However, despite this, overall feedback from interviewees on lecture theatres and seminar rooms was positive, with them rated as 'eight' and 'nine'; 'mostly satisfied'.

Personal study and breakout areas

The physical spaces offered within the building are, in some respects seen as innovative, allowing for people to gather outside of the lecture theatres. There is a high level of satisfaction with these spaces among respondents as they rated them as 'totally', or 'mostly satisfied'. Spaces are well used by students. "Students are working in them all of the time, they are brilliant."

Fig 3 Satisfaction with the spaces in the Teaching and Learning Building



FEEDBACK RELATING TO RELATIONSHIPS, COMMUNICATION AND COLLABORATION

Consultation

This was an unusual project, in that there was no one, single building 'owner' for this building. Therefore, broad stakeholder input into the design of the Teaching and Learning Building was a key element of the project journey. This consultation was considered by many to have been a success.

There is a sense from those key stakeholders interviewed for this Post-Occupation Evaluation that they have had a hand in designing the spaces around the actual need, and that the consultation undertaken was successful in this regard, *"We have been able to design it around the need. When I came in, I was asked what size classrooms we needed, they had been designed on 60. I said, no you need 30s and they went away and changed it."*

It was clear, however, that for some respondents there was some tension between stakeholders wanting to be very innovative and others wanting to do very practical,

pragmatic things. For example, *"There was endless debate about 'we just want a 400-seat lecture theatre' and then other people saying, 'that's a dreadful way of teaching' we want a flexible lecture theatre."*

Relationships

There was mixed feedback throughout the interview process on the quality of relationships on this project.

For those who were connected to the project as advisors from within, the University, relationships worked well. For some, the relationships were successful because the right people, with the right knowledge were consulted within the project. The domestic services team, working directly in the building with the contractors, formed good relationships with the main contractor.

For those on the consultant project team itself, there was a more mixed response to the question concerning relationships. On the whole, relationships between the University and the consultants were seen as more successful than those with the contractor. The contractor was seen by some as having a somewhat adversarial style, and at the workshop the contractor acknowledged that at time relations were strained. This resulted in the University's project manager commenting; ; *"At times I felt a lot of my time in the role was about making sure that everyone else's relationships were still professional."* The University's project manager was considered to be successful in maintaining those relationships, being approachable and not fostering a blame culture. It was also noted at the workshop, that despite these challenges, 'everyone kept talking'.

Collaboration within the wider team

Collaboration was viewed similarly to relationships and communication by respondents.

Again, for those experts from within the University consulted on the project for their area of specialism, there was satisfaction with collaboration. One respondent noted *"Everyone was listened to. I think the openness helped"*

However, for some members of the project team, collaboration was rated lower, particularly in terms of the relationship between the contractor and the architect. For some, their experience on collaboration was markedly less positive following novation than it was before.

The contractor explained that they had had mixed experiences with collaboration on this project among members of the supply chain. However, the contractor found relations with the University remained positive and collaborative, which was the view of a number of respondents.

Recommendation:

- Use principals' meetings to raise issues and provide feedback on any problems that arise with regards to collaboration

Communication

"Last minute changes weren't brilliant, like the addition of a staircase. Possibly communication to academics. I didn't feel like there was enough. Within the project, communication within us was fab, but out into the wider community it wasn't brilliant."

There was a mix of feedback on communication. For one respondent, where involvement was lost at points in the project journey, key decisions were made which affected the project. They also experienced scenarios where there had been a mismatch in communication between them and the contractor - an example given was around the installation of the cabling for a lectern; *"I would say it was miscommunication. It was a misunderstanding, not deliberate."*

Other participants felt that, at times, communication could have been timelier about the things that were important to their area, one example was the Timetabling team who experienced delays in receiving room numbers, vital for them in order to plan room usage. The respondent also noted that communication with academic future users of the building could have been improved.

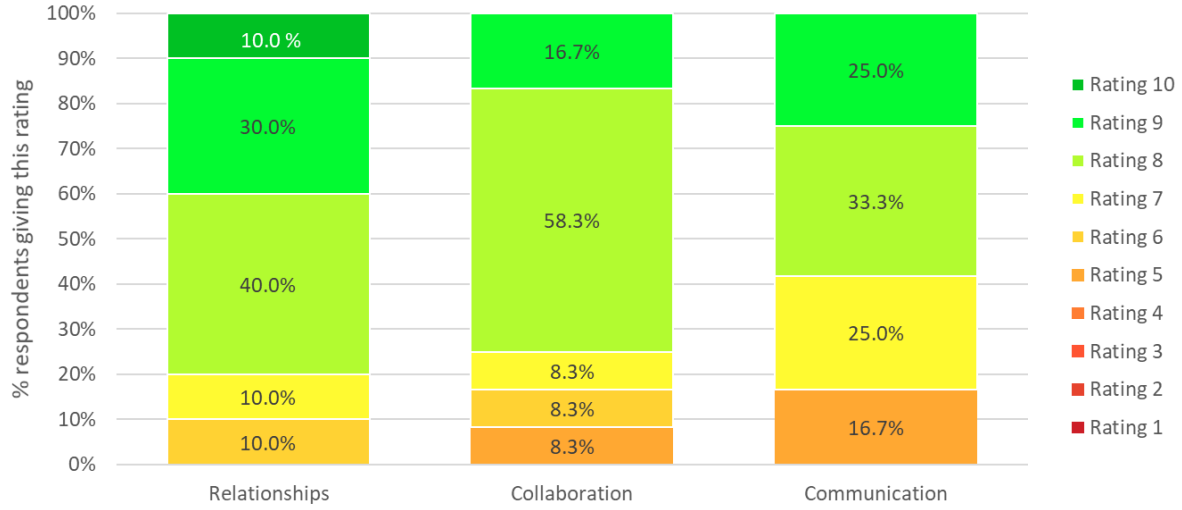
For members of the consultant team, feedback on communication with the contractor was more positive than communication with other members of the project team. However, this view was not shared by all. A number of University stakeholders experienced good communication with the contractor, such as those involved in organising furniture, and the domestic services team.

Clear communication with the PMG (Project Management Group) was a key learning for one respondent, in terms of ensuring that, going forward, the team are fully aware of any significant changes to the plan. In the case of this project, a lack of clarity with this group meant a removed staircase required reinstating at a late stage of the build. Workshop attendees noted that since this project PMGs have evolved, and the University now has new, clearer terms of reference for the PMG with a set agenda and more formal process.

Recommendation:

- Continue to work within the new terms of reference, fixed agenda, and fixed reporting protocol and highlight what is expected from members of PMG

Fig 4 Satisfaction with the relationships between members of the project team.



FEEDBACK RELATING TO MAIN CONTRACTOR AND SUPPLY CHAIN

The main contractor

There was another mixed response to the request for feedback on the main contractor.

For those who worked with the contractor in connection with their roles within the University, their feedback was that they were 'just satisfied'. One member of University staff noted that they valued the honesty of the contractor in terms of timings, which was crucial to the team concerned because this affected operations for them; *"I quite liked the honesty of the meetings. Previously in other places I have worked, we have had a lot of contractors telling us 'everything will be fine' and actually we had a lot of 'we need to look at some delays'. The honesty was really appreciated from my point of view, because I need to plan 18 months in advance."* For the Domestic Services, involved in preparing the building for opening, relationships with the contractor were good, with the finishing foreman singled out; *"I thought he put up with an awful lot of whinges."*

Feedback was far less positive from those in the wider consultant team, and two respondents rated their satisfaction as 'mostly dissatisfied'. Damages were levied on the contractor because of how late the project was. This was the first time this had happened in 11 years. Relations between the contractor and the cost consultant were strained. There was considered to be a lack of transparency with the contractor, which made *"things unnecessarily difficult regarding costs."* One participant commented that the slow pace at which costs were received affected decisions on variations. It was felt by the University that a rough figure would have enabled them to have made decisions, but there was too much focus on getting exact figures from subcontractors.

This was a design and build project, and it was perceived by members of the team that the contractor was reluctant to either accept the design itself or fully understand how to implement that design. At times, the design was not implemented in the way that the designer had specified, for example with the lecture theatre ceiling where the specified floating ceiling was not installed. There was a sense that decisions were taken to save

money and time, however, the ceiling required rebuilding, causing delays to the programme. *"The design is there, it's in place, the specification was in the documents, the architects had specified exactly what you should use, but because it was expensive, they wanted to use something else."* The idea of cost-cutting was not a view shared by the contractor who explained that there had been additional items added which hadn't been in the contract.

Relations were strained between members of the project team, and the contractor's approach at times was seen as adversarial rather than collaborative. Workshop attendees explained that a high point was reached in the tension between the contractors and other members of the team. Following this, a new team, put in place by the contractor towards the end of the project, did, for some, improve their levels of satisfaction and in their eyes, *"helped matters by removing a lot of the blockers."* It became more about getting the job completed.

Recommendations:

- Contractor to explore issue around slow responses to cost variations.
- University to explore whether, should a similar issue arise, they push the contractor to change the cost management team.

M&E Services

Feedback was, again, split into pre and post-novation, in relation to M&E. The M&E designers were rated positively by a number of respondents. *"They were very proactive and reactive when needed."* Pre-novation, the architect had a very good working relationship with the services engineer, sharing a focus on passive and sustainable design, from the start.

Post-novation, feedback for the mechanical and electrical subcontractors was more mixed. For one respondent, it was felt that the M&E subcontractors had adopted a contractual manner and another explained; *"They were a bit slow in getting drawings and it was like 'we need you to approve it now otherwise we can't do it."*

The main contractor also had a mixed experience with the subcontractors concerned, the electrical contractor performing significantly better than the mechanical subcontractor.

For those managing the operation of the building post-completion, there were concerns around the installation of the acoustic screens for the refrigeration panels, which make access and maintenance of the units very difficult, "*if almost impossible*." The respondent noted; *"I don't think there has been any real thought about that…It's a bit like 'we have been instructed to do this and it's not our problem' type of thinking."*

Recommendation:

- The issue of access to the refrigeration panels was being investigated by the University at the time of the workshop.

Supply chain

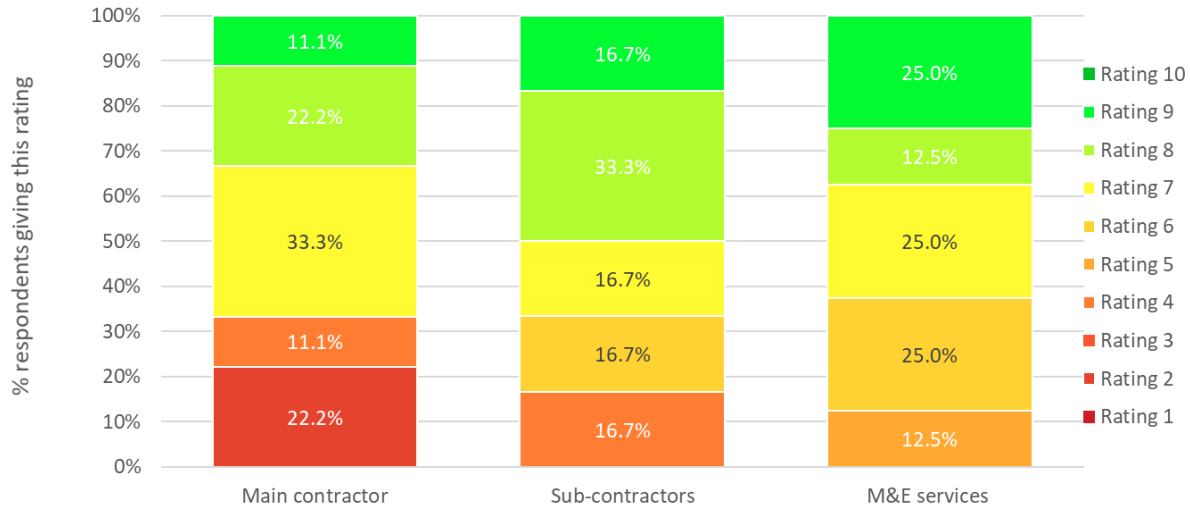
Among the small sample of respondents, the extensive supply chain involved in this project, understandably received mixed feedback. One respondent noted; *"We had some people who performed very well and some who performed appallingly."*

The furniture contractor was mentioned positively by a number of respondents, as an established supplier for the University. They were flexible in working within the unfinished space. However, for one respondent they lacked some creativity on this particular project in realising the vision for this space, which differed from that for other projects.

The contractor used for the staircase was also highlighted as good, working with the main contractor and the University to install the additional staircase as a separate package of work.

The intumescent painting contractors were highlighted as particularly poor in their work to fireproof the stairwells. They did not use the specified product and lacked robust paperwork in confirming the alternative product's suitability.

Fig 5 Satisfaction with the performance of the team involved in the Teaching and Learning Building



FEEDBACK RELATING TO PROGRAMME

This project was beset with delays and was handed over eight months late. The contracted completion date was January and it was handed over in August. Discovery of Japanese knotweed on site meant that site access had to be changed. This combined with an already challenging programme and issues with foundations made it challenging to maintain the programme.

According to respondents, during the development, despite the programme falling behind, the contractor reassured the team that they could make up the time, while other members of the project team felt this was not possible. *"Early on, I could see that they were falling quite significantly behind programme. the contractor kept denying it."* At one point the University worked on a solution with the contractor to help the contractor to accelerate the programme, saving around twelve weeks.

The contractor feels a longer programme would have helped, however, in retrospect not as long as the final delay, because they acknowledged that there were *"elements that we could have done better."*

FEEDBACK RELATING TO HANDOVER, COMMISSIONING AND DEFECTS

Several members of the project team had issues with the handover. One respondent referred to handover as 'fraught' due to the delays that had occurred, and another felt the building wasn't ready for handover, but was needed as conferences were booked. Another respondent referred to handover as 'pretty poor' and felt there wasn't much by way of walk-throughs and training.

For those who were connected with the timetabling of the building, notification of room numbers was released later than they would have hoped, and there was a lack of understanding of how important this information was for planning room allocations.

At handover, O&Ms were complete and delivered on time. Handovers from AV and IT suppliers, a significant element of the project, were rated far more positively by University staff members.

In terms of commissioning, for the teams involved in the maintenance of systems, there have been few ongoing issues. It was noted by one of those respondents closest to the project that "*we got there in the end*" but commissioning of systems had taken time to get right.

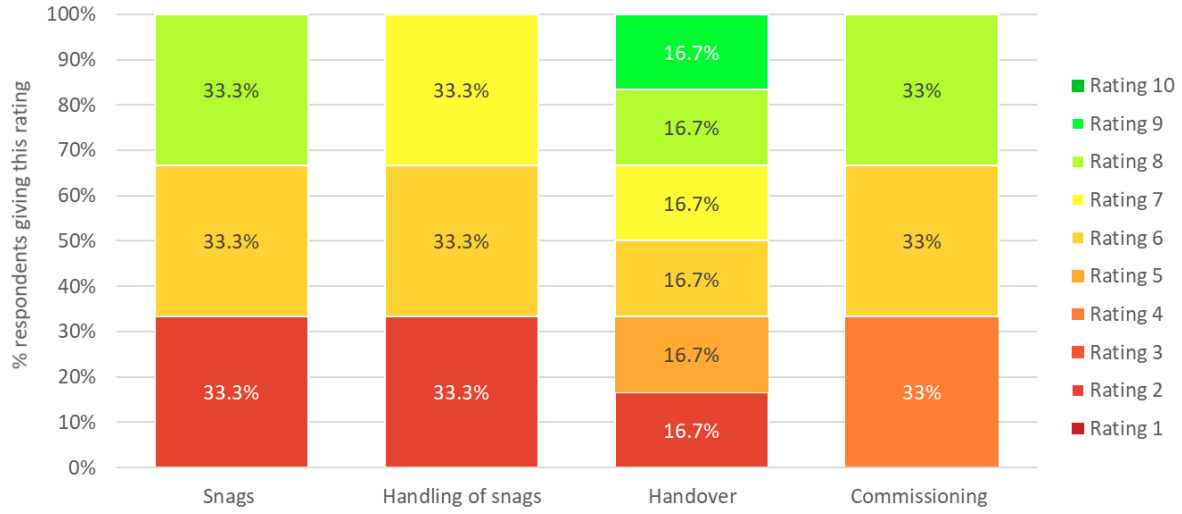
Resolution of snags

There were a significant number of snags and the contractor was rectifying those for over a year following completion. The University acknowledged that this could have been due to their rushing the contractor to complete the building for August. However, given how late the building was, they couldn't allow extra time without the building in operation for them to be rectified.

There was disappointment from the architect at the workshop that planned site quality walks, which were proposed as a way to head off problems on the project, were not enthusiastically taken up. Other attendees agreed that getting core team members together would have resolved issues and perhaps addressed any issues at an earlier point in the project journey.

One respondent to the questions on snags was totally dissatisfied, others were 'just satisfied'.

Fig 6 Satisfaction among key stakeholders with handover, commissioning, the level of snags and how they were handled.



Recommendation:

- Explore the instigation of formal and thorough site quality walks in order to address issues at the earliest opportunity.

POST-OCCUPATION - END USERS

INTRODUCTION

This part of the report, examining the building in occupation, is split into two separate chapters. This first section details the feedback received from users of the building. A User Satisfaction Study, conducted in April 2019, collected 521 responses. Most respondents were students, but feedback was also received from both academic and non-academic staff members as well as members of the public.

Later in this report, there is a separate section examining the feedback received from the key stakeholders canvased during the depth interview phase of the project, relating to the building in operation. Here, the sample sizes are much smaller, with twelve interviews being undertaken and a smaller subsection of the group feeding back on the building's performance in use.

FEEDBACK RELATING TO THE KEY SPACES IN THE TEACHING AND LEARNING BUILDING

Overall satisfaction with the rooms within the TLB was high, with average satisfaction ratings of between 8.3 and 8.8 for all respondents; mostly satisfied.

Average ratings among both staff and students across all of the different spaces was 'eight' or above, 'mostly satisfied', with one exception. Staff rated the lecture theatres slightly lower at 7.5, 'just satisfied'. Areas which attracted most feedback from users are:

Study spaces

By far, most of the comments received in response to this question were around the study areas, which is unsurprising given the popularity of the space among students for study. They were the most appreciated element of the building among users, with one student commenting: "*It has lots of different kinds of working spaces and tables and desks of all different shapes and sizes, which makes it suitable for everyone's preferences.*"

The comments largely highlighted that students would welcome increased capacity and availability; one student comments: *"[There are] not always enough study spaces*."

Seminar rooms

The comments relating to seminar rooms were also around capacity, the layout of the rooms and the flexibility of the space: "*Seminar rooms are sometimes too small or poorly set out for the interactivity needed.*"

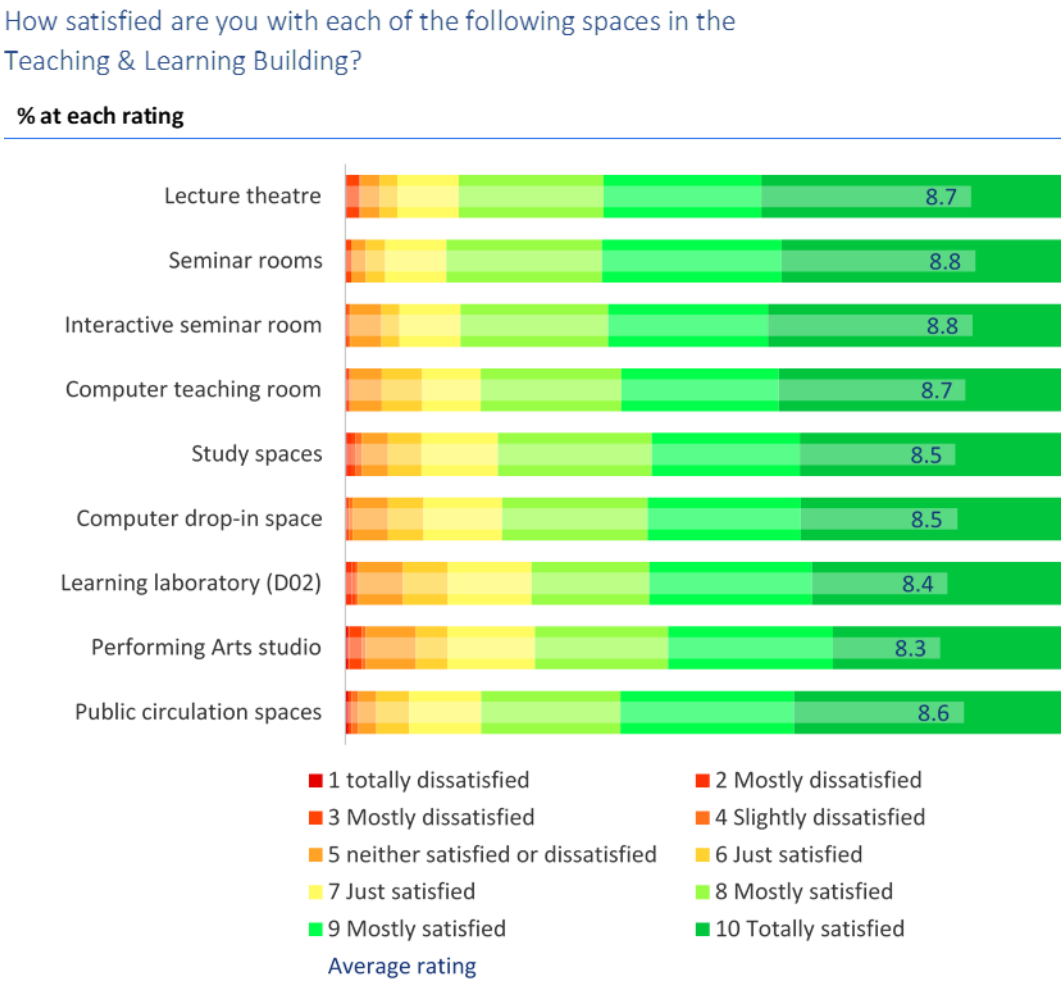
Public Circulation spaces

The few comments received about the public circulation spaces largely focused on availability and seating. One respondent requested "*more seated areas between lectures*."

Performing arts studio

The performing arts studio also received fifteen comments, primarily around the space being too cold.

Figure 7: Satisfaction among users as to key spaces within the Teaching and Learning Building



Feedback relating to the environment in the Teaching and Learning Building

The TLB clearly provides an environment that users find conducive to study, as the main theme among the comments related to the quality of the building's environment. The light and airy atmosphere and the spaciousness of the building were highlighted by respondents with feedback including: *"[It is] easy to work in - very light and airy and makes for a good working environment.*" and "*It is really spacious and, most importantly, many windows with light, which is perfect for studying*." The new and modern space and the quietness of the space were also valued by respondents: *"[An] incredibly modern building with open and well-equipped facilities. The quiet study area upstairs really helps me concentrate."*

Overall satisfaction across all aspects was, ‘mostly satisfied’. However, the following areas were those which elicited most feedback.

Temperature

Temperature was rated slightly lower than other areas; at 7.4 and attracted the most comments from respondents to this question. The most commonly mentioned issue was the cold temperature, but it was clear that there is a variation between areas, as others were considered too hot by some users. One respondent commented: “*Room temperature inconsistent (too warm/cold).”*

Food, drink and vending

Improving access to food and drink were the most common suggestions for additional features for the TLB. By far, the most frequently suggested additional feature was a café, and a typical response was, “*A café that sells drinks and sandwiches*.” At the workshop, it was confirmed that a café has now been opened in the building.

Respondents also requested more water dispensers in order to fill their own bottles more easily: “*Water fountains, not the drinking ones there at the minute, as you can’t fill a bottle easily*.” They also suggested more vending machines: “*A café/coffee machines maybe*.” Vending was rated as 7.9 by students, and much lower by staff at 6.1. Again, this elicited a number of comments with users keen to see an increase in the number of vending machines available in the building, a representative comment being: “*more vending machines on other floors.”*

Furniture and capacity

Comments from users showed they were keen to increase capacity with more tables and chairs: “*Some more chairs [would be appreciated] as it’s often very busy*.” Power points and print hubs also received a number of comments with users highlighting issues with faulty power sockets: “*Plenty of power points are available but unreliable”*. Furniture was another area which staff rated lower; 7.8 for staff versus 8.6 for students.

When asked about any issues or problems with the Teaching and Learning Building, furniture, was the most commented upon issue. While some of these were around the comfort and use of furniture, others related to the amount of furniture available, underlining, again, the popularity of the building: “*More seating areas because I've found myself looking for some when it's busy.”*

Highlighting again the popularity of the space, a common theme among suggested additional features was an increase in seating and study areas. A representative comment of “*more study space – extra tables/chairs on C, D, E floors.”*

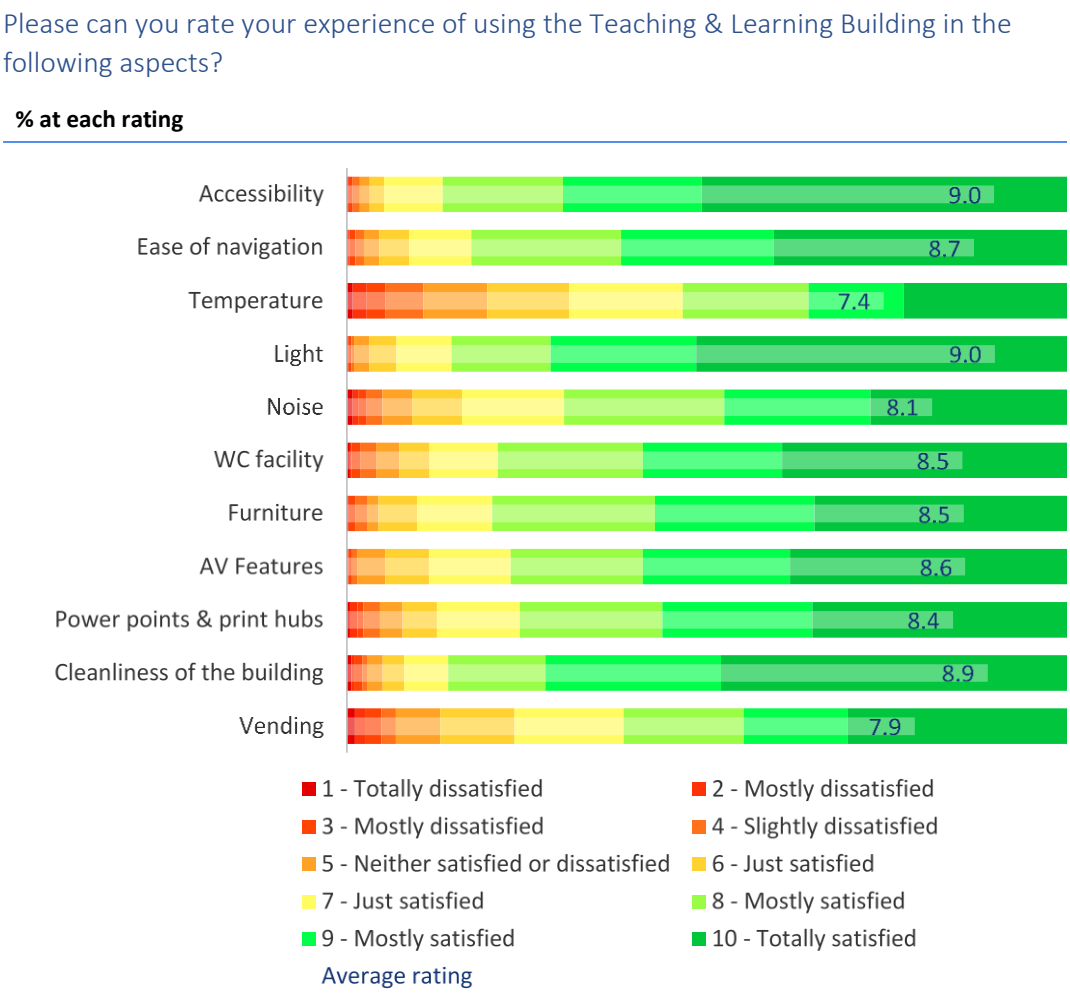
Reliability of technology

Issues with the reliability of technology was cited as a problem for a number of respondents, who had experienced plugs, charging points or whiteboards being out of order. For example, one respondent commented: “*Some of the charging points don't work*.”

Recommendations:

- Explore the feasibility of instigating a system for students to report any issues easily.
- Look into instigating proactive inspection and repair arrangement.

Figure 8: Satisfaction among users as to key elements of the Teaching and Learning Building

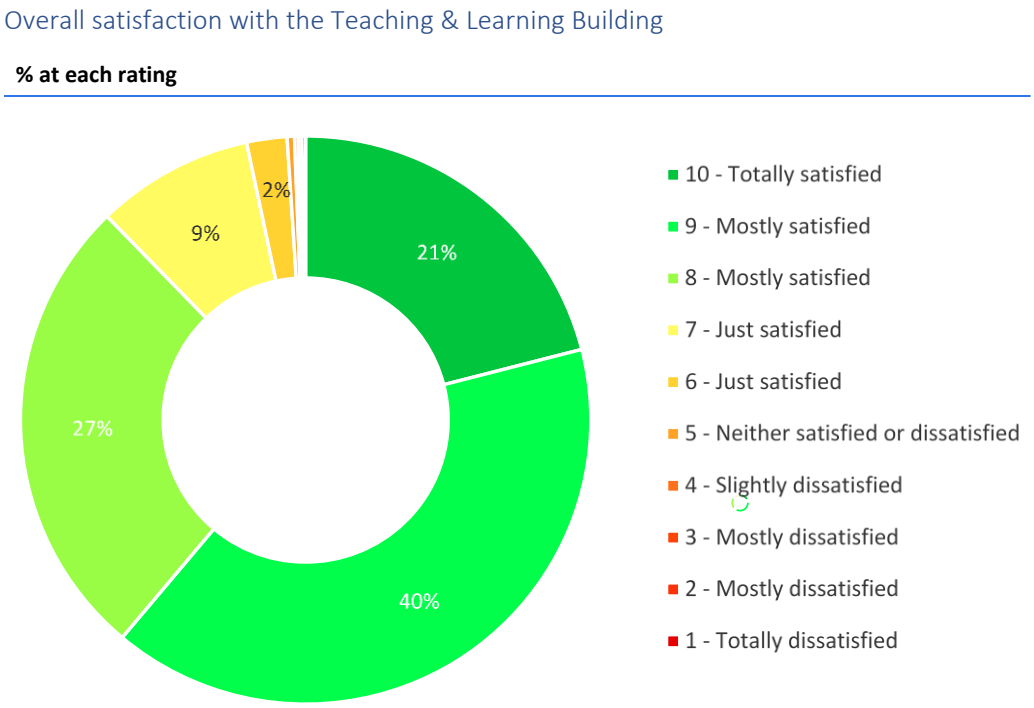


Overall satisfaction with the TLB

Overall satisfaction with the TLB among those canvassed was extremely high, with an average rating of 8.6; 'mostly satisfied'.

Staff were slightly less satisfied than students overall; students rated the space with 8.7 and staff gave an average rating of 7.6 (although it is worth noting that numbers of staff in the sample were extremely low).

Figure 9: Overall satisfaction with the Teaching and Learning Building



Overall, it was clear from speaking to respondents on the day, and analysing the feedback given, that most respondents highly valued the study space provided by the TLB. This is illustrated by the number of positive comments received compared to the negative remarks. This also tallies with the suggestions for improvement which were largely focused on a café, vending and access to water, presumably so users could spend longer in the space and not interrupt study time to leave in order to get refreshments. Another key improvement suggested by respondents was ‘more space to work’. Again, this is further indication of how popular the space is, particularly among students, and how well it meets the requirement for an effective study space of the users for whom it was developed.

POST-OCCUPATION - FEEDBACK FROM KEY STAKEHOLDERS

Feedback on the overall quality of the Teaching and Learning Building

The majority of respondents were 'mostly satisfied' with the overall quality of the Teaching and Learning Building, with one respondent rating they were 'totally satisfied'.

While mostly satisfied, some other participants noted a number of different 'wear and tear' and quality of finish issues. These included the toilets 'looking shabby', a decorative tree having died, the finish of wood laminate panelling on the stairs as well as side ceiling panels falling down.

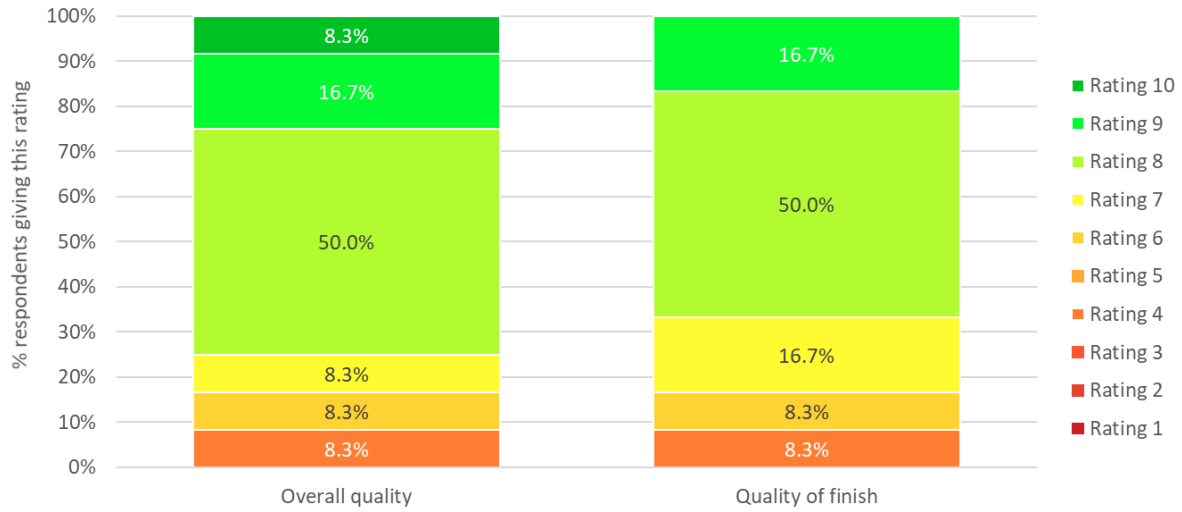
For those that were less satisfied, one found the number of staircases difficult "*I don't like the staircases, because I think it's a bit too white."* another respondent was concerned about what they saw as a lack of attention to detail in places.

Feedback on the quality of the interior finishes and workmanship

The majority of respondents were 'mostly satisfied' with the quality of finish in the Teaching and Learning Building. For those closest to the project, the attention to detail shown by the project manager and the architect helped ensure that finishes were of as high a standard as possible by ensuring that the contractor had followed the design. One example was "*pushing to make sure that little design things like the external paving lines up with the mullions."* For those less satisfied, who were perhaps closest to the project, there were elements where they feel there had been a lack of attention to detail, such as in painting on the steelwork or the veneer on the stairwell. One respondent summed it up as "*I wouldn't say it detracts from the success of the building but when you look at it through a designer's eye, you notice the bits and bobs."* During the workshop, attendees felt that where certain elements fell down, it was the lack of co-ordination of detail, such as that between tiling, external cladding, CLT, windows and rainscreen.

On workmanship, most respondents to this question, other than those very closest to the project, had not witnessed particularly good or poor workmanship. However, one respondent who was very aware of the finish, felt that at times, their input was crucial in achieving high standards. They shared the example of stacked bonded brickwork which required lime mortar, and they had needed to push the contractor to ensure this element of the project was delivered correctly. Timber panelling on the south side of building was described as a 'terrible' example of workmanship by one respondent and small details such as coat hooks glued rather than screwed into the back of doors was noted by another. Paving, however, was an example of good workmanship, as were the drama studios.

Fig 10 Satisfaction with the overall quality and the quality of the finish of the Teaching and Learning Building



Functionality

Most respondents are 'mostly satisfied' with the functionality of the Teaching and Learning Building, of the nine respondents to this question, five rated this as a 'nine', 'mostly satisfied.

The building is busy, demonstrating how well it is working for students, and has been built in line with the original intent for the building. One respondent noted how they were 'totally satisfied' with the functionality of the building because it had been designed around 'need'. *"Now we have double the occupancy because otherwise we would have empty space. Designing it around the need was key. I have seen so many buildings go up around universities that are designed around what the architect wants rather than what is actually needed."*

Flexibility

Respondents were again 'mostly satisfied' with the flexibility of the building, all rating this as 'eight' or 'nine'.

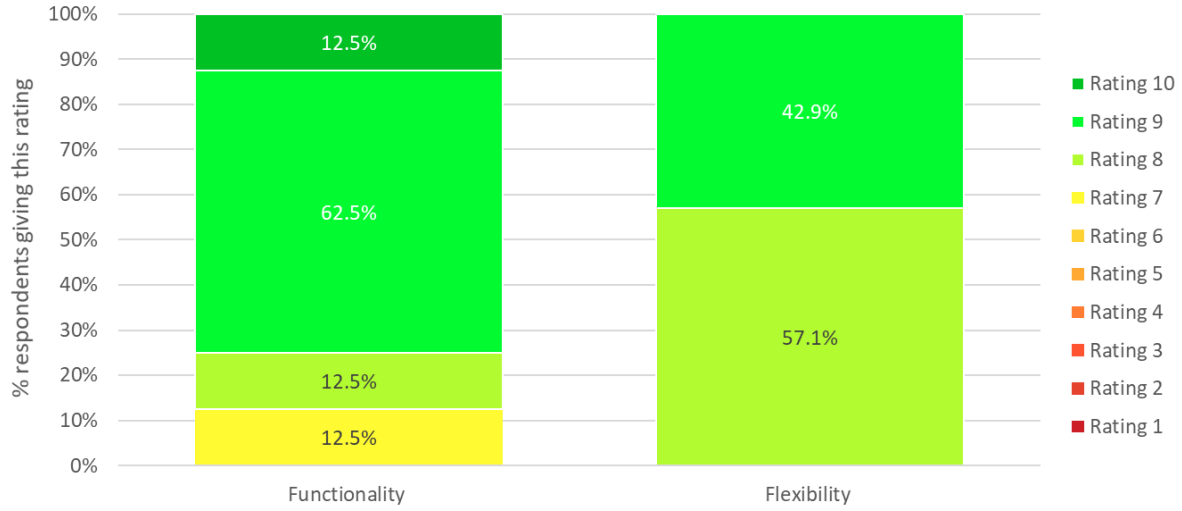
This building is designed not only to be able to be allow for flexibility in day-to-day use, but its structure is designed in such a way that it could be adapted, without significant structural work, to meet any future needs that the University has for teaching space. All the internal walls can be removed, and the space can be divided up in a variety of different ways without affecting the performance of the building.

The building clearly met the requirements of respondents in this regard; *"It was a key element, but you can't just move it overnight. It's still a major project. But if we suddenly decide that 30-seat rooms aren't suitable and we need 60 seats, we could knock a few walls*

out and change the power and data and AV and quite simply get those spaces how we need them… It's building structure and the building framework enables us to do that."

For building users themselves, on a day-to-day basis, the building was flexible with *"the rooms that have been designed to be flexible and easy to move around, are easy to move around".* However for some, spaces that haven't been designed to be as flexible, lighter, more easily moveable furniture would have further enhanced the ability for academics to adapt the space to suit specific teaching practices. This was discussed at the workshop and it was felt that the most flexible, yet robust, furniture had been sourced for the rooms. For this reason, for example, no power is on the desks in the seminar rooms to ensure they can easily be moved around.

Fig 11 Satisfaction with functionality and flexibility in the Teaching and Learning building.



FEEDBACK RELATING TO OPERATIONAL ISSUES

Satisfaction with how the building operates

Overall there is a high level of satisfaction among respondents as to how the building operates. One respondent said, *"I am very satisfied, I love it. I think it's great…Everything else as a teaching facility works."*

One respondent noted that the lack of a regular building attendant does mean that there is no-one to report any issues to, such as problems with drinks dispensers, to spot any wear and tear issues or offer a level of security.

Operational issues

Lifts

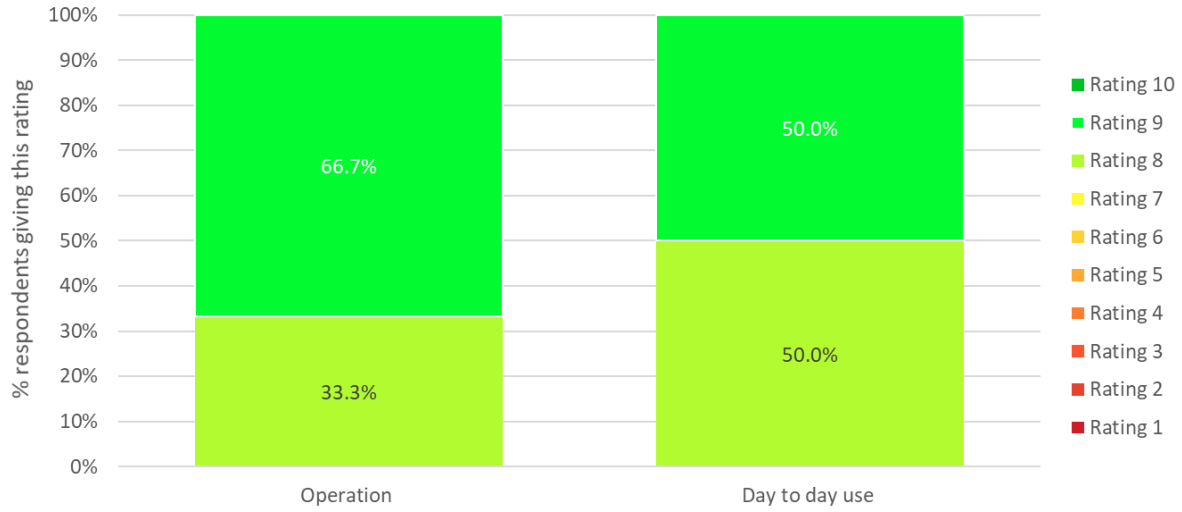
One of the most regularly mentioned operational issue in the Teaching and Learning Building was the reliability of the lifts. The Estates team member responsible for

maintenance within buildings noted that the lifts were not of a good quality and the supplier was not one that would be recommended. Unfortunately by the time they were aware of the plan to use them, the lifts had been ordered. Subsequently, the lifts have regularly been out of order for long periods, causing issues, not only with accessibility for building users and staff, but also for domestic services who clean and maintain the building

How the building is standing up to day to day use

Overall, respondents feel that the Teaching and Learning Building is standing up well to day-to-day use. There was one comment about the building requiring additional cleaning to keep it looking it's best and another respondent noted that it had taken some time to get the cleaning of the building right, but it was now working well.

Fig 12 Satisfaction with how the building operates and how it is standing up to day to day use



FEEDBACK ON AV AND DATA CONNECTIVITY

AV

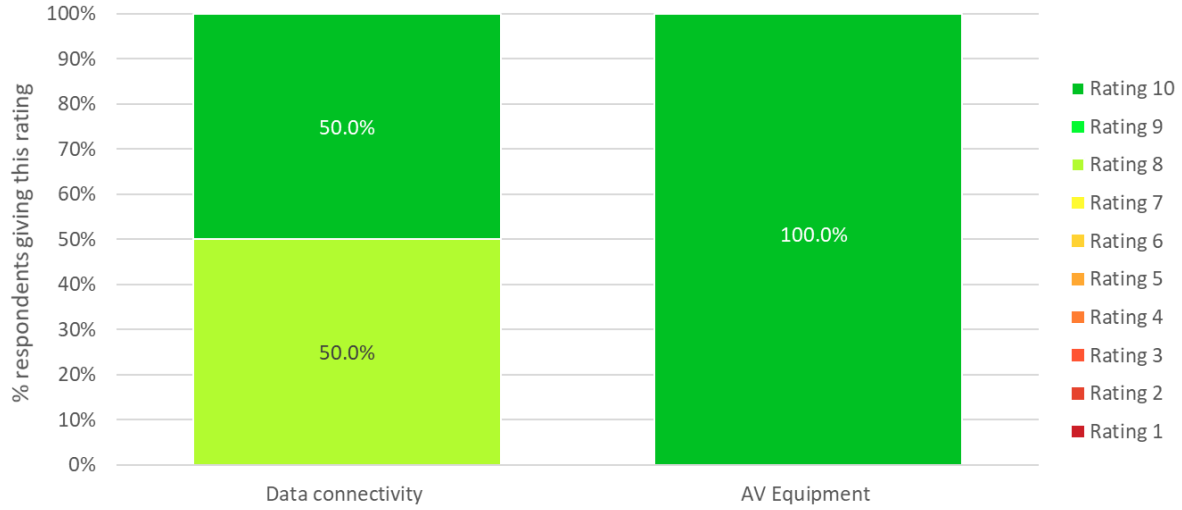
The small number of respondents asked about AV in the Teaching and Learning building were 'totally satisfied', and for some this was seen as a key innovative element of the project. At £1.6m, this was the biggest ever contract for any AV supplier the University had used.

For the member of the team responsible for implementing AV and IT systems, however, there was some communication challenges in implementing the systems, with a mismatch in language between the contractor and themselves, making the process more challenging for them. However, this didn't affect their being 'totally satisfied' with AV. Their only disappointment being that the same systems weren't available elsewhere in the University. Another respondent noted that some academic members of staff had found the systems initially 'scary' to use.

Data connectivity

One user noted some initial teething issues with data connectivity, but there was a high level of satisfaction overall among respondents.

Fig 13 Feedback relating to data connectivity and AV equipment in the TLB



FEEDBACK RELATING TO THE QUALITY OF THE INTERNAL ENVIRONMENT

Lighting

Overall respondents were 'mostly satisfied' with the light in the Teaching and Learning Building. The natural lighting was seen a good and helped create a light and airy feel within the building.

Cleanliness

Satisfaction with the cleanliness of the Teaching and Learning Building was lower than in other areas. A number of respondents made reference to how wet weather quickly affected the cleanliness of the building and despite lots of matting being available, water could be trodden through the building, creating the possibility for slippery floor surfaces.

It was noted that issues with cleanliness are not a unique problem for this building, with the amount of use this building has, and with students being allowed to eat and drink there, *"the University hasn't yet balanced that out with the fact that they need more cleaning than other buildings."* The stairs were a particular area that become dirty and are not cleaned as regularly as they would be ideally due, to the logistical issues around shutting off those areas to students.

The manager responsible to cleaning in the building explained that because of the volume of people using the building, a scrubber dryer would aid in keeping the building clean.

Recommendations:

- Explore what the real cleaning issues are and consider manoeuvring cleaning resource to those areas which may be lacking.
- Look at whether it is appropriate for eating and drinking to be allowed throughout the building.
- Continue to encourage use of the revolving doors to alleviate both dirt and drafts

Temperature

Temperature received mixed feedback. One respondent said that the temperature varies in different parts of the building, with the atrium feeling *"chilly"* and seminar rooms warm.

Another respondent noted that the automatic doors are used regularly rather than the revolving doors, and the delay in them closing allows cold air to come into the entrance area. A proposal has been made the move the revolving door from the ground floor A onto B floor in order to stop this happening.

At the time of the workshop data from the BMS was being analysed to assess whether there were any specific issues in the building.

Recommendation:

- University to explore whether to automate the revolving door.

Noise

All respondents rated noise levels as a 'nine', explaining that the building is 'excellent' in this regard. One respondent said, *"It's surprisingly quiet. I don't know whether students like it or not. It's very different for me, it's quieter than the library." Another notes "In the atrium, either the acoustics are keeping extraordinarily quiet and or the acoustics are good because it doesn't travel."*

Without any signage detailing expectations around how users should work there or any staff monitoring of the space, workshop respondents noted that the continued quiet environment in the Teaching and Learning Building is completely self-regulated by users. Issues with noise experienced in other spaces on campus, such as libraries, simply don't appear to be an issue here. Attendees questioned whether the 'almost cathedral-like grandeur' achieved through the central space help contribute to this.

No noise bleed was reported between any of the rooms in the building.

One issue that has been raised by building users is that the automatic vents allow the noise from the Hallward Library air conditioning into the building.

Vending and catering

In line with responses from building users, it was noted by a number of respondents in the depth interviews, that what the building lacks is a café. This was the most frequently suggested facility when respondents were asked whether there were any additional features that should have been included in the Teaching and Learning Building. Vending was rated as 'just satisfied' and one respondent noted; "*You don't see people going in to use them [vending machines]. It would have been much better with a café…It's probably the poorest part of the building*."

Since the interviews were completed, a 'pop-up' café has been installed into the Teaching and Learning Building.

Toilets

Toilets were rated as 'seven' and 'eight' by respondents; 'just' and 'mostly satisfied. There was little depth feedback on this aspect of the building, suggesting they were operating well.

Fig 14 Satisfaction with the internal environment

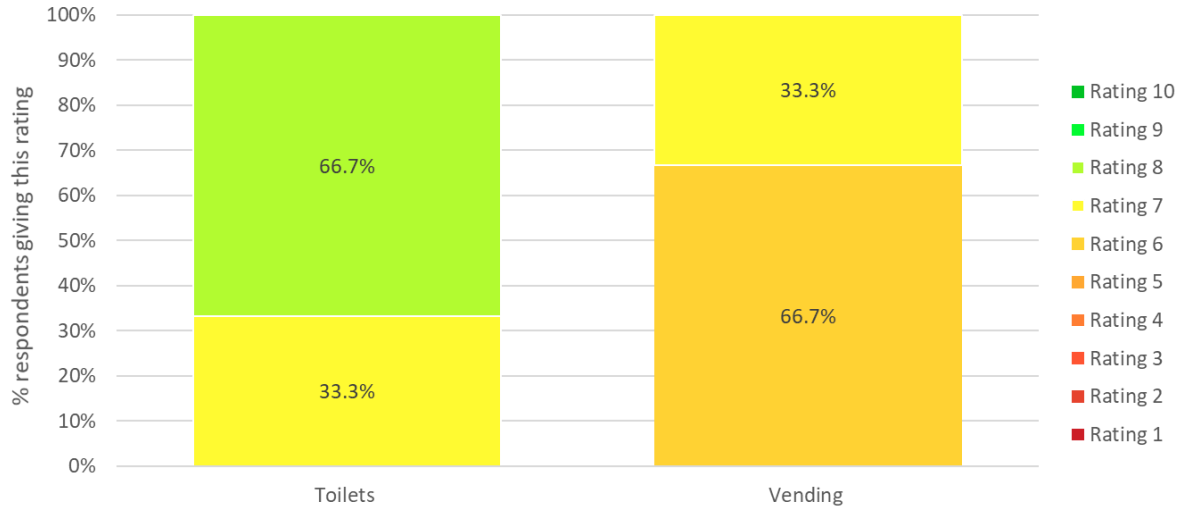
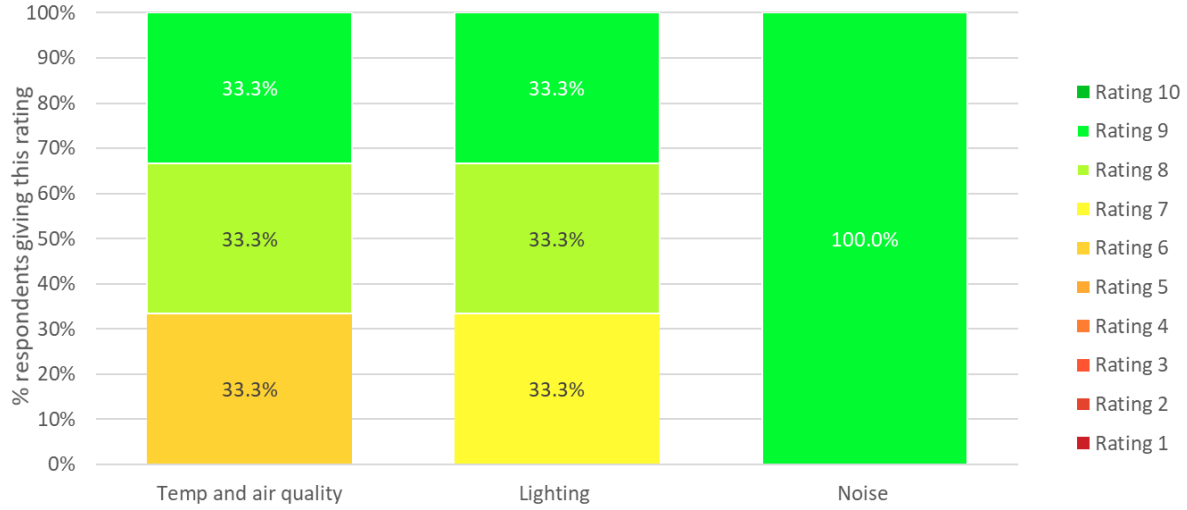


Fig 15 Satisfaction with the internal environment



FEEDBACK RELATING TO ACCESSIBILITY AND NAVIGATION

Navigating the building

Overall, end users felt positive about the ease of navigation around the Teaching and Learning Building. One respondent commented that while, overall, it isn't difficult, and the layout was logical "*If you are new to the building, wayfinding or digital signage would help on each floor.*" Another respondent noted, "*If you're a new student and you have just arrived on campus and you are in that building, you don't think 'oh my goodness where am I going to go?' you just know instantly. It's simple, the floors are signposted nicely.* "

One respondent felt that the lecture theatre, is not brilliantly signposted if you go in the wrong door. If you go in on B floor you are not quite sure that you're on B floor and you need to go down to A floor to get into the lecture theatre. Another remarked that, ironically, the addition of the new staircase makes the building slightly less easy to navigate '

Accessibility

With ratings of 'eight' and above, accessibility was rated positively by respondents; "*It's fine there are plenty of doors and staircases so accessibility for the able bodied is fine*." One respondent did note that it was a shame that a number of the doors on floor A were taped off, and felt it was disappointing that the original vision to 'spill out' onto the outside area hasn't been realised.

Provision for disabled users

Feedback on provision for disabled users was less positive, with two ratings of 'six' and 'seven', just satisfied. The lack of changing space for disabled users influenced this rating for one respondent, and heavy doors in the seminar rooms were mentioned by another.

Recommendations:

- For future buildings, incorporate changing areas as a briefing issue.
- Look at the possibility of temporarily re-allocating a space, within the TLB, as an accessible changing area

FEEDBACK RELATING TO SECURITY

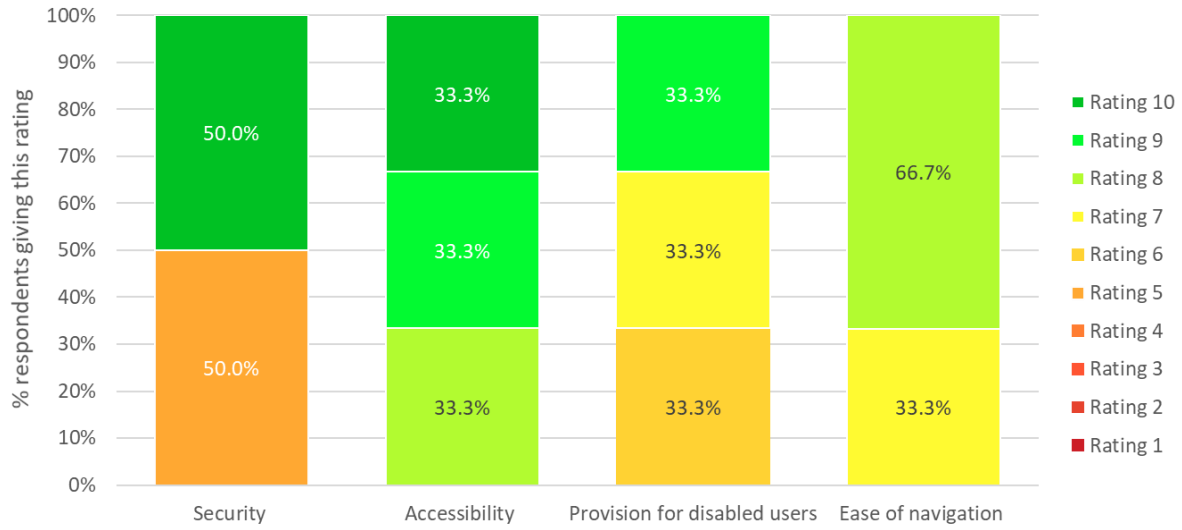
Security

Of the very small sample of respondents that provided feedback on security, there was a mixed response.

One respondent had had a poor experience of security early on in the building's operation following the theft of computer equipment after a contractor failed to install security cables. They note that there is no permanent member of staff located in the building, which makes the building vulnerable to such theft. Another respondent noted that it was a 'mystery' as to what the opening hours were in the building, but that *"intrinsically, I don't think it's bad."*

Another rated security as 'ten' because they had experienced no issues with security.

Fig 16 Satisfaction with security, accessibility and ease of navigation



FEEDBACK RELATING TO ENVIRONMENTAL PERFORMANCE AND SUSTAINABILITY

Sustainability was woven into the structural elements of the project. The University's aim was to build in future adaptability of the space into the project, and this very much defined the structural system for the building. In addition, there are no wasteful finishes like plasterboard. The steel and plank structure is elemental, which means that should the building ever be demolished it could be dismantled and elements of it used for new projects.

However, some sustainable elements of the original design were foregone for costs, and there is regret for one respondent that the benefits of using timber in a structural way wasn't fully understood. *"Generally, people are scared of change because they see it as a risk. There is nothing wrong with that. Equally if we build everything out of steel and concrete for ever, then we are not going to solve sustainability challenges and our buildings are going to be boring."*

APPENDIX I: SUMMARY OF RECOMMENDATIONS

Budget

- Acknowledge the need for honesty in each V.E. item. Assess whether this is truly V.E., or is it actually cost reduction?
- The implications of any V.E. items should be fully discussed and appreciated.
- The University to continue to adopt a more fluid budget on build projects, aligning the budget as the design progresses so that there is less of a disparity when it comes to a V.E. exercise, therefore, hopefully, less of a need.
- Explore the possibility of practical, collaborative workshops for V.E. programme management, with timelines. These would include discussions as to what implications of V.E. changes may be.
- Avoid changing any of the core consultant team halfway through the project, as this had a negative impact when important knowledge was lost.

Procurement

- Review whether this form of procurement provides the best long-term value for the University

Collaboration

- Use principals' meetings to raise issues and provide feedback on any problems that arise with regards to collaboration

Communication

- Continue to work within the new terms of reference, fixed agenda, and fixed reporting protocol and highlight what is expected from members of PMG

The main contractor

- Contractor to explore issue around slow responses to cost variations
- University to explore whether, should a similar issue arise, they push the contractor to change the cost management team

M&E services

- The issue of access to the refrigeration panels was being investigated by the University at the time of the workshop

Resolution of snags

- Explore the instigation of formal and thorough site quality walks in order to address issues at the earliest opportunity.

Cleanliness

- Explore what the real cleaning issues are and consider manoeuvring cleaning resource to those areas which may be lacking.
- Look at whether it is appropriate for eating and drinking to be allowed throughout the building.
- Continue to encourage use of the revolving doors to alleviate both dirt and drafts

Temperature

- University to explore whether to automate the revolving door.

Provision for disabled users

- For future buildings, incorporate changing areas as a briefing issue.
- Look at the possibility of temporarily re-allocating a space, within the TLB, as an accessible changing area

APPENDIX II: TABLE OF KEY BUILDING DATA

Budget	Actual/Outturn
£18.5	£23m
Gross area	
6,000sq metres	6,282sq metres

Energy Consumption by End Use [kWh/m2]		
Heating	31.74	36.20
Cooling	1.28	1.03
Auxiliary	6.50	3.99
Lighting	9.11	15.06
Hot water	1.84	2.03
Equipment*	25.94	25.94
TOTAL**	**50.48**	**58.30**

- * Energy used by equipment does not count towards the total for calculating emissions.
- ** Total is net of any electrical energy displaced by CHP generators, if applicable.