

## Status of Teaching and Learning Space at UCC

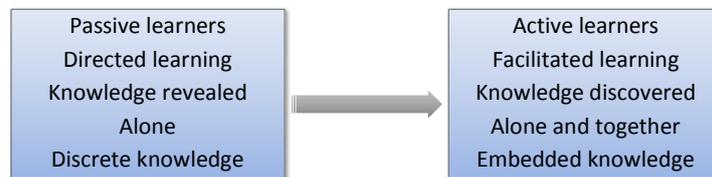
Report - October 2015

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### BACKGROUND

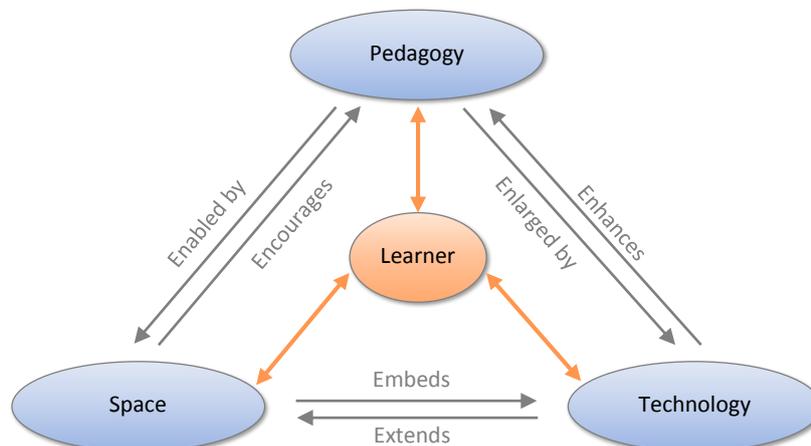
Learning space and educational technologies have a clear influence on the quality of learning that occurs in a university<sup>[1-3]</sup>. Recognition of the interdependence of learning space, learning outcomes and the effectiveness of universities provides opportunities for the enhancement of teaching, learning and the student experience<sup>[4, 5]</sup>. Teaching and learning in universities traditionally took place in teacher-centred lecture theatres, smaller group tutorials or laboratories. Developments in both pedagogies and technologies have led to a transformation in the design and use of learning spaces, enabling the development of graduates with the attitudes and skills needed for independent learning throughout life<sup>[6]</sup>. Three major trends inform current learning space design: Support for active learning, human-centred design and increasing ownership of mobile devices<sup>[1]</sup>.

Large lecture theatres traditionally focussed on teacher-centred learning remain and an important component of university teaching and learning space. However this format is being transformed with changing educational objectives and practices, to incorporate emerging pedagogies and technologies<sup>[7-9]</sup>. There has been a shift towards active learning, which is learning by reflection, by doing and by conversation and engagement by students in collaborative learning which places the student at the centre of the learning process<sup>[9]</sup>. This trend has been enabled by advances in educational technologies, while also providing opportunities for the development of new pedagogies<sup>[9]</sup>.



**TRENDS IN TEACHING AND LEARNING**

Radcliffe et al<sup>[10]</sup> propose a framework for the design of learning spaces based on the findings of the Next Generation Learning Spaces (NGLS) project at the University of Queensland. This framework recognises the reciprocal relationships between each of the three elements: pedagogy, space and technology. This conceptual model was further developed by Wayne<sup>[11]</sup> who places the learner at the centre of the learning process. Opportunities and support for active learning come at the intersection of the three elements, and future learning space in universities will integrate space, pedagogy and technology to create real engagement<sup>[12]</sup>.



**PEDAGOGY-SPACE-TECHNOLOGY FRAMEWORK FOR THE DESIGN AND EVALUATION OF LEARNING SPACES<sup>1</sup>.**

Active learning occurs where students engage in activities, such as reading, writing, discussion, collaboration or problem solving that promote analysis, synthesis, and evaluation of class content<sup>[13]</sup>. Student engagement is positively impacted by comfortable, flexible and appealing learning spaces that encourage interpersonal interaction and are supported by technology. Students feel less responsible for participation in more traditional teacher-centred classrooms with fixed furniture. Student engagement is further discouraged by less comfortable physical conditions. Studies of the learning space characteristics that enhance student learning demonstrate clear relationships among learning space, instructional practices and learning <sup>[1, 8, 10]</sup>. Among the most important characteristics of university learning spaces that directly affect learning outcomes and student experience are:

- Flexibility of learning space <sup>[14-16]</sup>
- Support for diverse pedagogies <sup>[17]</sup>
- Support for educational technologies <sup>[5, 18]</sup>
- Quality of physical space <sup>[4, 19]</sup>

As pedagogical methodologies and the activities taking place in learning spaces at UCC are evolving it is timely now to undertake a review of current learning spaces, furniture and technology in terms of the capacity to support effective teaching and learning. While learning environments in the 21<sup>st</sup> century include online and virtual environments as well as informal learning spaces and specialised learning spaces such as laboratories, this study focussed on physical on-campus learning spaces that are centrally bookable.

## OBJECTIVE

The objective of the learning space review was to assess all centrally bookable teaching rooms in UCC in relation to their teaching and learning capacity and experience, and to evaluate their physical condition and the adequacy of the instructional technology. This will help to inform the design and implementation of upgrades and of new learning spaces at UCC to provide the best teaching and learning spaces possible in terms of learning environment, classroom furniture, educational technology and comfort.

## SUMMARY FINDINGS

### Capacity

- 158 rooms were included in this study which comprised a total capacity of 9,377 seats
- 60% of rooms have enough seats to meet room capacity, with at least one chair missing from all other rooms

### Flexibility

- 27% of rooms, accounting for 54% of capacity, contain fixed furniture

### Facilities

- 85% of rooms have a whiteboard, 24% have a chalkboard, 15% of rooms contain a fixed TV and 75% of rooms contain an overhead projector for transparencies and in 59% of rooms more than one of these screens can be used simultaneously
- 33% of rooms have voice amplification using fixed microphones

### Teaching station

- 77% of rooms have a data projector with a resident PC and in 73% of rooms it is possible to connect a mobile device to the data projector/fixed TV, either using VGA and/or HDMI, but not DVI connections
- In 63% of rooms the teaching station is positioned so that the teachers has their back to the students when operating the audio visual equipment.

### Learning technologies

- Lecture capture software is available in 45% of rooms. Cameras are fixed, which restricts teacher movement
- 13% of rooms contain a document camera
- 8% of rooms have no Wi-Fi access
- 21% of rooms have no power outlets for students

### Quality of space

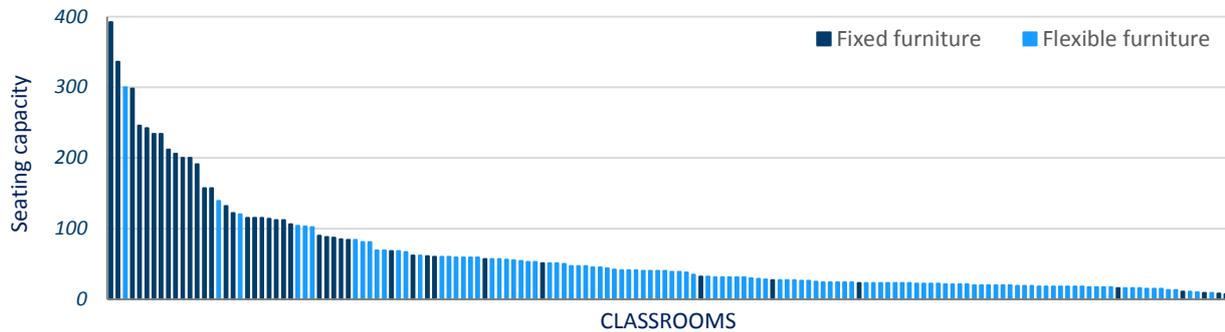
- 8% of rooms were properly signed with the room number and appropriate centrally booked room designation
- 82% of rooms have natural light and in 73% of these rooms it is possible to control the light levels using curtains or blinds to enhance screen visibility
- The decorative quality in 3% of the rooms was exceptionally poor, and they were considered not fit for purpose

### Facilities for persons with disabilities

- The presence of hearing loops for persons with disabilities was indicated in just 6% of rooms
- 87% of rooms were wheelchair accessible and in 70% of rooms the podium was wheelchair accessible

## Capacity

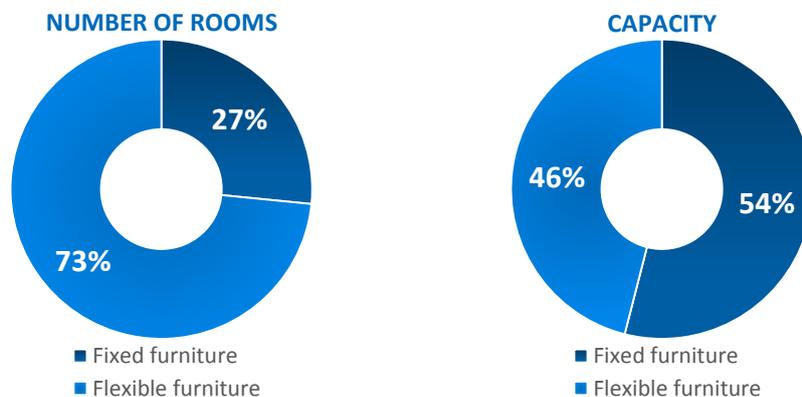
A total of 158 rooms were visited during the course of this assessment of learning space. These provide a total capacity of 9,377 seats. The capacity of learning spaces across the campus ranged from seven to 400 and the distribution of room sizes is shown in the figure below. However, just 60% of rooms had sufficient seating to meet the advertised room capacity. Fourteen per cent of rooms were missing one or two seats, while the remainder were missing three or more.



## Flexibility

The provision of diverse types of learning space is becoming increasingly important in universities. However, the ability to reconfigure the layout of existing space is also important, as it allows flexibility of use of learning spaces and enables collaboration and interaction and the implementation of a range of pedagogies. Learners should be able to move from listening to one speaker (traditional lecture) to working in groups (group and project activities) to working independently (reading, writing, accessing electronic resources) during class time<sup>[1]</sup>. The more flexible a learning space is in terms of supporting different pedagogies, and the easier it is to reconfigure furniture, the better the level of student engagement, communication and collaboration<sup>[16]</sup>. Different types of spaces are also required to support different pedagogies and the one-size-fits-all approach to learning space design that was once widespread is no longer valid.

The seating capacity of the learning spaces at UCC is provided in rooms with either traditional-style fixed seating facing the front of the room, or flexible seating and moveable furniture capable of supporting active learning and a variety of pedagogies as required. While 73% of rooms had moveable seating, this accounted for just 46% of total capacity. It is important to note that large tiered lecture theatres are designed to have sound travel optimally in one direction only and as such they provide a barrier to active student engagement<sup>[3]</sup>.



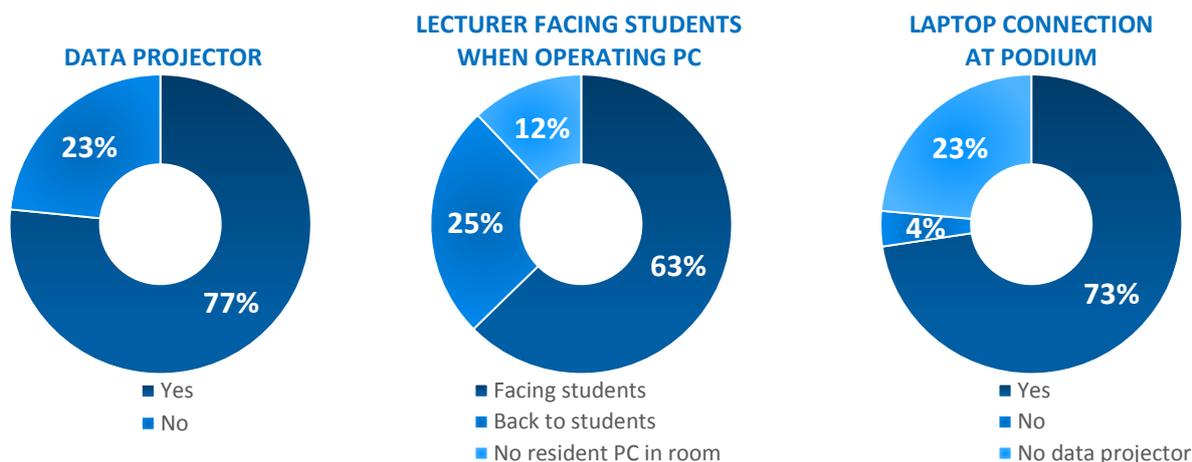
## Facilities

- 77% of rooms have a data projector to display computer, video or document camera on screen
- 82% of rooms have a single, large projection screen
- 85% of rooms have a whiteboard
- 24% of rooms have a chalkboard
- 75% of rooms have an overhead projector for transparencies
- 77% of rooms have a data projector
- 59% of rooms have the capacity to use more than one screen simultaneously
- 33% of rooms have voice amplification using fixed microphones and less than 1% have voice amplification using wireless microphones
- 40% of rooms have video playback using VHS and 87% have video playback using DVD
- 15% of rooms have a fixed TV

## Teaching station

The teaching station in a classroom houses controls for the audio visual facilities in the learning space. All rooms should have data display technology and there should be a facility to connect a portable device for display on the main screen. Furthermore, it should be possible for the teacher to face the students when operating the audio visual facilities.

77% of rooms surveyed had a data projector and, in rooms with natural light it was possible to control the light using curtains or blinds to improve screen visibility in 73% of them. This means that in 8% of learning space there is no capacity to control light in order to improve screen visibility. 85% of the rooms have a resident desktop computer connected to wired internet. Each of these computers is at a podium, or teaching station, but 25% of the podiums face the projection screen rather than the classroom, making presenting more difficult. 84% of the rooms have the capacity to connect a laptop to a data projector/fixed TV, either using VGA (84%) and/or HDMI (26%), but no DVI connections are available.



Room frequency  $\left(\frac{\text{Hours room used}}{\text{Hours room available}}\right)$  was higher in rooms with data projectors (73%) than in rooms without (56%)<sup>1</sup>.

## Learning technologies

Learning spaces that enable the use of educational technologies play an important role in educational outcomes<sup>[2]</sup> and research has shown that students expect seamless technology use in modern universities<sup>[1]</sup>. Technology supporting modern pedagogies is largely related to the audio-visual equipment and includes slide display, lecture capture and distance learning software. A survey of UCC staff in 2014 revealed that 93% expect technology to be an essential part of teaching in the future. Learning technologies include the use of PowerPoint presentations, which require data projectors, and these facilities are widely available across UCC as described in the previous section of this report, Wi-Fi access, lecture capture and videoconferencing<sup>[9]</sup>. Newer technologies in learning spaces include those suited to active learning such as audience response systems, interactive white boards and multiple data projectors.

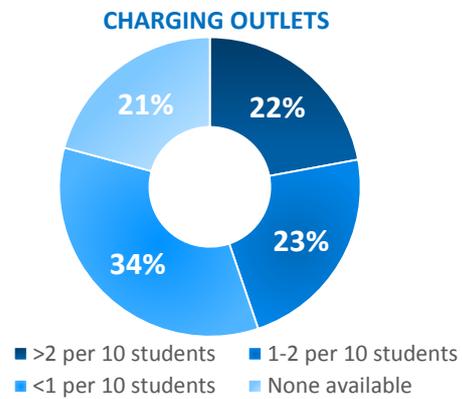
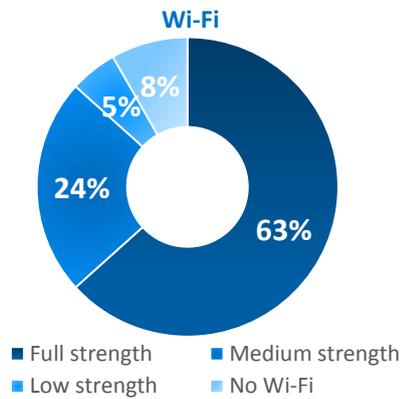
Lecture capture is possible in 45% of rooms surveyed at UCC, but in the majority of these rooms (76%) the camera is fixed at the podium or in the ceiling above the podium, thus restricting lecturer movement during recording. Document cameras are provided in 13% of rooms. Just two centrally-bookable rooms at UCC are set-up for group videoconferencing, Western Gateway Building meeting room 231 and Cork University Hospital Lecture Theatre. Audience response systems are not currently available. Inadequate funding for, deployment and maintenance of learning technologies limits pedagogical innovation<sup>[20]</sup>.

## Student devices

Support for student web-connected mobile devices is an important consideration in modern day teaching and learning spaces. Wi-Fi connectivity is a basic requirement of all learning spaces and the capacity should be sufficient to accommodate all concurrent connections. Charging outlets and horizontal surfaces should be available to all students.

At UCC 88% of students own a laptop and 42% own a tablet. The availability of Wi-Fi in learning spaces was assessed by measuring the strength of the Wi-Fi available using one mobile device. It is not possible at present to connect student devices to the main display screen in any of the centrally-bookable rooms, except for the same way lecturers can. There is hardware being trialled in one lecture room in the library where student screens can be displayed on the main screen, and there are possibly software solutions being developed for this purpose but none are currently available at UCC.

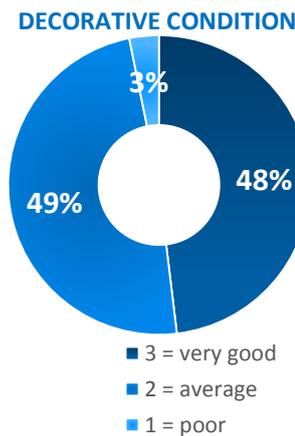
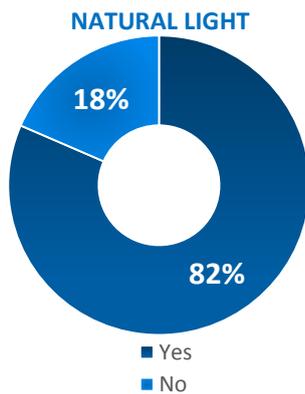
<sup>1</sup> Data from Room Utilisation Report for 2014/2015 Academic Year, prepared by Breda Good, UCC



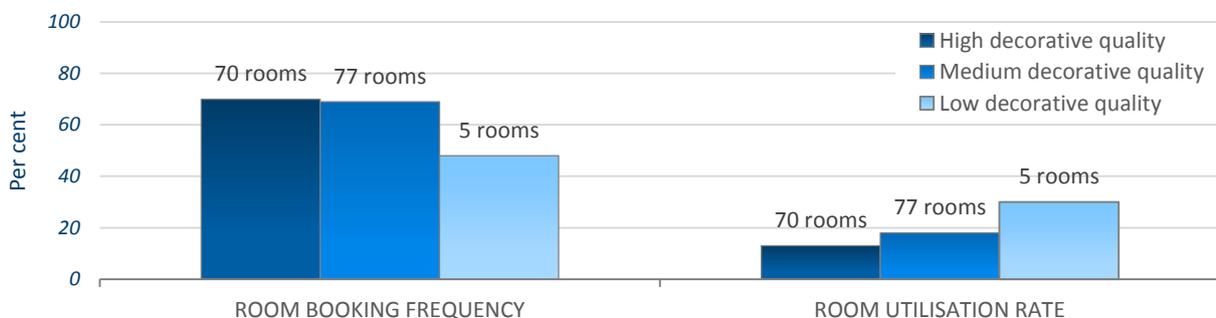
### Quality of Space

Quality of learning space such as thermal conditions, lighting conditions, furnishing and aesthetics are associated with positive student outcomes<sup>[1, 19]</sup>. There are very few rooms at UCC (8%) which are signed with the full centrally-bookable name that matches the name used in the timetables. The rooms that are correctly titled are contained mainly in the Aras na Laoi building, Cork Enterprise Centre and in the Cavanagh Pharmacy Building. Most rooms had a timetable chart at the main entrance door (97%) and 75% of these were up to date.

The vast majority of rooms were clean and tidy (97%). All rooms were assessed visually for general decorative condition and scored on a scale from 1 to 3, where 1 = poor (not currently suitable for teaching), 2 = average (suitable for teaching although would benefit from repair, not suitable for guests of UCC e.g. to hold a conference in), and 3 = very good (suitable for guests of UCC). The majority of rooms had easy access to both toilets (85%) and drinking water (75%).



Room frequency ( $\frac{\text{Hours room used}}{\text{Hours room available}}$ ) and room utilisation rates ( $\frac{\text{Room frequency}}{\text{Seat occupancy}}$ ) were similar in rooms with average or very good decorative quality, but lower in rooms with poor decorative quality.



### Facilities for Persons with Disabilities

There were very few rooms that indicated the presence of a hearing loop (6%), and these were mainly located in the Western Gateway Building. It is possible that other rooms did contain a hearing loop, the presence of which is not indicated by a sticker. Many hearing impaired students carry a portable hearing loop with them for lectures. The majority of rooms were wheelchair accessible (87%) with wheelchair access to the podium in 70% of learning spaces. Just 45% of the 29 larger lecture theatres included in this study (capacity ≥ 100) had podiums with wheelchair accessibility. 87% of rooms were close to wheelchair accessible toilet facilities.

## QUALITATIVE OBSERVATIONS

During the course of this survey all centrally bookable teaching rooms were photographed. Photographs of the some highest and lowest quality learning spaces at UCC are provided below, accompanied by qualitative information on individual rooms, where appropriate. Five of the 157 learning spaces had a low-level ranking for general decorative condition, and did not provide an environment appropriate for learning.

### C\_ELECT\_L1

Location: Centre campus  
120 flexible seats  
86% booking frequency  
48% room utilisation<sup>1</sup>  
Fixed student facing podium  
Inadequate location signage  
No hearing loop  
Low decorative ranking



### C\_WDL\_ANTL

Location: Centre campus  
90 fixed seats  
69% booking frequency  
43% room utilisation  
Fixed student facing podium  
Inadequate location signage  
Not wheelchair accessible  
Low decorative ranking



### C\_DIST\_G.01

Location: Outer campus  
35 flexible seats  
20% booking frequency  
14% room utilisation  
No data projector  
Inadequate room signage  
Not wheelchair accessible  
Low decorative ranking



**C\_DIST\_G.02**

Location: Outer campus  
30 flexible seats  
23% booking frequency  
15% room utilisation  
No data projector  
Inadequate room signage  
Not wheelchair accessible  
Low decorative ranking



**C\_BV6\_11**

Location: Centre campus  
20 flexible seats  
43% booking frequency  
32% room utilisation  
No data projector  
Inadequate room signage  
Not wheelchair accessible  
Low decorative ranking



**C\_WGB\_G14**

Location: Outer campus  
69 flexible seats  
85% booking frequency  
51% room utilisation  
Fixed student facing podium  
Inadequate room signage  
High decorative ranking  
Good facilities for persons with disabilities



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