THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

Collaborative Learning Space Design Requirements

Version history

Version Number	Description of Change	Change Made by	Date Changes Made
V1.0	Document approved	Learning Space Sub-Committee	6 December 2019
V1.1	Additional text to security section	Matthew Scott	1 April 2020
V1.2	Modification of 6.5 *Sound Amplication*, to *Audience Participation* Adjustments to 3.3 *Space Density* and 3.4 *Room ceiling height*	Matthew Scott	26 October 2020
V1.3	Adjustment to 5.3 *Seating*	Matthew Scott	8 March 2021

Report particulars

Prepared by: Design Requirements Working Group

Prepared for: Learning Space Sub-Committee

Finalised: 6 December 2019

Disclaimer

This document is the collaborative effort of the Design Requirements Working Group formed by the Learning Space Sub-Committee of the Teaching and Learning Committee of The University of Queensland (UQ). The requirements herein do not absolve the parties providing subsequent design services, from the responsibility to provide fit for purpose, functional and complete facilities that satisfy all applicable building codes.

This document will be maintained by the T&L Project Manager (Learning Space) within the Institute for Teaching and Learning Innovation and in collaboration with relevant stakeholders.

This document will be reviewed annually through the Learning Space Sub-Committee.

This document will form part of a suite of design guidelines for The University of Queensland.

Contents

Tables

Appendices

Appendix A   Design Checklist

1.   Introduction

1.1   Purpose

This document comprises the collaborative learning space design requirements (CLSDR) for the planning and design for formal collaborative learning spaces. This document is intended to be used by UQ project stakeholders, including:

- Learning Space Sub-Committee (LSSC);
- Property and Facilities (P&F);
- Institute for Teaching and Learning; Innovation (ITaLI)
- Faculties and Schools;

- Information Technology Services (ITS);
- Strategic Planning Office (SPO);
- building users;
- architects; and
- consultants

Collaborative learning space design requirements articulate the purpose and intention of collaborative learning spaces, such as:

- linking the development and performance of learning spaces to the University's strategic goals;
- standardising design requirements for learning spaces whilst supporting ongoing innovation in design solutions that facilitate active, collaborative teaching and learning pedagogies; and
- minimising design and construction issues that negatively impact learning space performance.

The collaborative learning space design requirements have been developed in recognition of the breadth of collaborative teaching and learning approaches at the University. This document seeks to guide the design and development of spaces that support the variety of these practices to create spaces that have enduring value.

1.2   Scope

The CLSDR encompasses formal spaces that support collaborative active learning, including:

- flat-floor collaborative space;
- tiered collaborative space; and
- technology-enabled collaborative space.

Collaborative learning spaces may be part of:

- new build projects (to be fully compliant with these guidelines); and
- renovations or renewal (where the CLSDR will be applied to the relevant or practical extent), e.g. If furniture is being replaced, only that part of these guidelines may be applicable; or where existing columns and windows are not practical to change.

While these guidelines do not prescribe learning activities, the main intentions for a learning space's activities will be developed in each project brief. As a guide, the characteristics of collaborative learning activities can include:

- students working as individuals, pairs, groups and as a whole group on an activity, to solve a problem, create an artefact or complete a task.

- instructors sharing information, or setting problems or tasks over short periods between group activities.

- supporting tutors may be present in the class to provide additional support to learners, helping to stimulate new ways of thinking about or approaching tasks. The instructor and tutors circulate the class to engage face to face with students working on their activities.

- learners may utilise technology or tools in their activities, to research, prepare, and share amongst their group, or with the class as a whole.

Collaborative learning spaces are one part of the University's learning landscape[1] and this document should be considered in that context.

As such this guide does not address so-called traditional learning spaces (used for didactic teaching), as those spaces are addressed in existing UQ Design Guidelines. Traditional learning spaces will continue to be part of the learning space portfolio, however space of this type may no longer be constructed.

Specialist, subject-specific learning spaces such as laboratories and studios, and informal learning spaces will be addressed in separate documents.

1.3   Methodology

The CLSDR is structured to encourage continued innovation in teaching methods and design outcomes, and the diversity of design solutions and spaces. The requirements are described by:

a.   the **intent** of a principle — an explanation of why, which is aligned with UQ strategic plans;

b.   the design **requirements** — what the design needs to do; and

c.   **additional considerations** — those considerations which are not mandatory requirements. This section includes reference documents for best practice solutions, describes preferred solutions (not mandatory as they may not be applicable to all situations), warnings regarding problems previously identified, aspect that should be considered in determining the right design solution, suggested approaches to the design principle.

Accordingly, the design and planning process of collaborative space is mission-based, and relates the provision of learning space to UQ's strategic goals.

The EDUCAUSE Learning Initiative (ELI) Learning Space Rating System,[2] tailored to UQ, has been used as a guide to develop the CLSDR.

---

[1] Dougdale, S. (2009) "Space Strategies for the New Learning Landscape", *EDUCAUSE Review*.
[2] Brown, M. Cevetello, J., et al.. (2017) *Educause Learning Initiative: Learning Space Rating System Version 2*.

2. Context and planning

2.1 Strategic context

The provision of Collaborative Learning Space is to align with the strategic academic plans and initiatives of the University. The following is an overview of the current key strategic context.

UQ Strategic Plan

A key component of the UQ Strategic Plan's (2018-2021) strategic focus areas is transforming our student experience through a flexible, integrated and partnered learning environment. A key performance indicator to realise the success of this strategic focus area is to configure learning spaces to encourage active and collaborative learning.

Campus Master Plan

The St Lucia Campus Master Plan (2017) promotes flexibility and adaptability to meet the changing demands of students, staff and learning requirements that are constantly evolving. It is vital to consider future-proofing construction to maximise whole-of-life value in times of unpredictable and ongoing change. As other campus master plans are developed (Herston, Gatton and other sites), they will be incorporated within this strategic context.

Student Strategy

The importance of flexible multi-functional spaces is outlined in the UQ Student Strategy (2016-2020). Flexible spaces will optimise the learning experience for UQ students in a number of ways: by drawing students to spend more time at UQ campuses; encouraging class attendance; increasing international students' sense of belonging and sense of community, as well as by enhanced use of currently under-utilised campus space and facilities.

Goal 4 of the Student Strategy focuses on an integrated learning environment; "to build a vibrant, practical and digitally-integrated environments that supports and enhances on-campus learning, community engagement and student life" (UQ, 2016, p.13). Key initiatives that relate to this vision include:

Initiative 1: Campus precinct development	Transform UQ's campuses into vibrant and sustainable communities of learning and innovation with residential, commercial, cultural, recreation, sporting, research and industry-based precincts.
Initiative 3: Enhanced multifunctional spaces	Continue to create high-quality, multifunctional student spaces that sustain and support formal and informal on-campus study, rest, and socialising.

2.2   Planning and design process

2.2.1   Roles and responsibilities

The successful planning, design and subsequent delivery process for Collaborative Learning Spaces requires the contribution of various university stakeholders.

Table 1:   Key roles and responsibilities in the planning and design process for central learning space projects.

Role	Position	Responsibility
Project Approval	Capital Management Group (CMG)	Approval of project and allocation of funding. Approval of appropriate governance structures.
Client Representative	ITaLI Learning Space Project Manager[3]	Project initiation. Preliminary Brief preparation. User stakeholder liaison and advocate. Learning Space Sub-Committee liaison. Post occupancy evaluation. CLSDR custodian.
Project Manager	P&F Project Manager (as appointed by the Associate Director Construction)	Construction project management. Preliminary Brief preparation. Cost control. CLSDR compliance.
Project Control Group (PCG)[4]	Consists of key and major stakeholders	Oversee the project. Receive and consider regular reports, make recommendations and/or endorsements.
Audio Visual Representative	AV Projects, Information Technology Services	AV design. Equipment supply. Installation and maintenance. Training and technical support.
Consultant Design Team	Architects (lead consultant) Services Consultants	Design services. CLSDR compliance and checklist
Infrastructure and Sustainability Unit	P&F Engineering Services	Reviewing compliance with the *UQ Property and Facilities Design Guidelines* and *Technical Guides*

It is the responsibility of the client representative and project manager to develop the governance / organisational structure for the project for CMG approval.

CLSDR compliance

The consultant design team is responsible for developing a design in accordance with the CLSDR where it is relevant, and demonstrating compliance. The client, Project Manager and/or PCG will be responsible for reviewing the design solutions' compliance with the CLSDR. Compromises may be necessary with some refurbishment spaces.

On larger projects, the PCG may delegate the responsibility of assessment to a sub-committee or group. The P&F Project Manager will be responsible for the sign-off of CLSDR compliance and issuing space data to the P&F Space Management Office for their records.

Refer to Appendix A for a checklist of design requirements to assist the review of CLSDR compliance. The consultant design team will be responsible for submitting the checklist to the P&F project manager at the end of the Design Development Phase (which aligns with the PREM submission).

---

[3] If the space is to remain faculty/institute controlled, their Facilities Manager may fulfill the role of the Client. In this instance, the ITaLI Learning Space Project Manager may be involved as a consultantive stakeholder.
[4] PCG may not be required for small projects. More complex governance may also exist for large projects.

Property and Facilities design guidelines and technical guides compliance

The CLSDR is to be read in conjunction with the current version of *UQ Property and Facilities Design Guidelines* and *Technical Guides 2014* and the *UQ Internal Signage Manual* which can be obtained from the P&F Project Manager. Property and Facilities Infrastructure and Sustainability Unit is responsible for reviewing compliance with the *UQ Property and Facilities Design Guidelines* and *Technical Guides.* The requirements of the CLSDR take precedent.[5]

Project brief compliance

The project brief captures requirements specific to the project, outlines project delivery methodology and relevant information for the delivery of the project. The client, Project Manager and/or PCG will be responsible for reviewing the design solutions' compliance with the project brief.

2.2.2 Project planning & delivery process

Intent

The successful development of the project via procedures of initiation, planning, execution, regulation and completion as well as via the guidance of the project team's operations to achieve all the agreed upon goals within the set scope, time, quality and budget requirements.

Requirements

- Develop the project brief, select the project delivery methodology and communicate this with required protocols and procedures, to the design team and relevant stakeholders.
- Guide the project team and stakeholders through the delivery of the project.

Additional considerations

- o Consider the following sections 2.2.3 – 2.2.7 as they may apply to the project plan. These items do not form part of the Design Requirements Checklist and should be referenced or a project specific definition included in the project brief.
- o If conflicts are encountered between the CLSDR and the project brief, or planning and delivery processes, advise the T&L Project Manager (Learning Space).

2.2.3 Stakeholder engagement

Intent

Involve and include all stakeholders and strategic partners in the learning space planning process.

Requirements

Include substantive stakeholder engagement in all stages of the planning and design process. Engage stakeholders through workshops, interviews, surveys, observational studies and/or meetings.

Stakeholder representation can include academics, students, ITaLI staff that support curriculum development, technology AV staff, facilities planning etc.

Additional considerations

- o The breadth of the stakeholder engagement should be commensurate with the scale of the project.

---

[5] The Design Guidelines and Technical Guides are under revision. There may be conflicts between the CLSDR and the Guidelines, in particular the CLSDR has more specific and onerous requirements in some areas.

- o Gather input to develop the project brief, and ensure user needs and functional requirements are met.

- o Prepare an engagement plan / communication protocol that enables user stakeholders to remain informed of the relevant design information and allows them to provide input.

- o Provide summaries of meeting notes, user surveys, reports, or other written evidence of engagement to the Project Manager and client representative.

- o Include stakeholders in post occupancy evaluations to gauge how well the spaces are performing.

- o Consider the engagement of academics and students with facilities stakeholders such as UQ ITS and UQ AV Projects, to foster collaborative relationships and productive, consensus based design outcomes.

2.2.4   Evidence-based planning and design

Intent

Base planning and design on research and documented best practices in learning space strategy and design.

Requirements

- Consult scholarly literature and expert publications of learning space design and associated disciplines.

- Review peer exemplars online, at UQ and other locations.

Additional considerations

- o Benchmark successful and aspirational spaces.

- o Engage on-campus or external learning space planning and design experts.

- o Conduct benchmarking tours to evaluate and learn from other spaces.

- o Allocate project funds to support these activities.

2.2.5   Pilots and prototypes

Intent

Trial, test and evaluate learning space design concepts through pilots and/or prototypes in support of an evidence-based planning and design process.

Requirements

Use appropriate space to test concepts and drive consensus around strategies for new design solutions.

Additional considerations

- o A pilot or prototype space may be utilised for ongoing training and staff/curriculum/learning activity development and user testing.

- o Component test with users, particular features of a space such as chairs, AV controls, etc.

- o Scaled appropriately to suit the size of each project and addressed in the project's brief.

2.2.6   Audio visual integration

Intent

Foster a collaborative approach to the integration of AV tools and technology and pedagogy. To minimise potential conflicts between user pedagogical aspirations and the technical and operational requirements of learning technology systems.

Requirements

Review learning technology options, trade-offs and related implications on pedagogy, room design and budget with the client representatives and UQ AV Projects.

2.2.7   Evidence-based research and assessment

Intent

To develop and implement a regular, iterative process of research and assessment that informs development of learning space and contributes to an institutional culture of evidence-based design.

Requirements

Create and maintain a learning space assessment and evaluation process that involves multiple campus stakeholder groups with defined iterative evaluation cycles.

Additional considerations

- o   Conduct post-occupancy space performance evaluations.
- o   At a defined timeframe evaluate whether the learning space has met the aspirations or goals of the project. Utilise multiple means of evaluation, gather baseline data and compare with post occupancy evaluation.
- o   Report evaluation findings to the Learning Space Sub-Committee.
- o   Research and assessment to be maintained centrally and to be used across multiple projects where applicable.

3.   Planning and layout

3.1   Locality

Intent

Locate collaborative learning spaces where they are visible and easily accessible. These spaces should be co-located to leverage the benefits of synergistic activity and create welcoming, collegiate environments that reflect UQ values, encourage cross-pollination of knowledge and ideas, and develop a sense of belonging at the cohort, School or program level.

Requirements

- Locate collaborative learning space in buildings that are universally accessible close to major circulation paths.

- Locate collaborative learning space close to the building's entrance and major vertical circulation (stairs and elevators).

- Co-locate/cluster collaborative learning space, and other compatible functions.

Additional considerations

- o   It is preferable for learning spaces to be located on the ground floor. On upper floors, learning space should be located close to vertical circulation and foyers.

- o   Provide clear and accessible routes from building entrances to collaborative learning spaces. The route and locations should be logical, without heavy reference to signage.

- o   Users should not pass semi-private spaces, such as offices where noise levels should be kept low.

- o   Isolate class-change noise and high-pedestrian traffic to learning spaces from noise-sensitive spaces such as offices, and research labs.

3.2   Adjacent waiting & informal learning space

Intent

Enable users to move in and out of spaces at class changeover without delay and frustration. To provide convenient, immediate access to spaces for self-directed learning activities, encouraging class preparation, discussions of class content before or after a formal session (with peers, teaching staff or others) or other self-directed learning activities.

Requirements

- Provide sufficient circulation and waiting space to facilitate orderly, efficient class changeovers.

- Provide, in addition to building circulation, **0.3-0.5m^2** per classroom seat of informal learning space adjacent to collaborative learning spaces.

Additional considerations

- o   Consider providing waiting seating in addition to informal learning seats. If there is insufficient waiting seats, students may sit on the floor in corridors and disrupt traffic flow.

- o   Covered, external space can supplement internal waiting space where required.

3.3   Space density

Intent

Provide sufficient space per student to support a board range of learning activities.

Requirements

Provide the following recommended area per person to account for appropriate space for collaboration[6]:

- Existing: **2.0 - 3.0m^2** per person
- New build: **2.5 - 3.0m^2** per person

Additional considerations

- o   Space density will be affected by sightlines, equipment, room size and room proportions. Room populations from the brief must be tested by the consultant design team, to ensure other design requirements can be achieved.

- o   As a guide:

Room Type	Seats	Recommended m^2 pp
Collaborative Flat Floor	8-16 seats	2.2 - 2.5 m^2
	16-40 seats	2.5 - 2.9 m^2
	41+ seats	2.3 - 3.2 m^2
Collaborative Tiered		2.2 - 2.6 m^2

- o   Allow sufficient space for the room to be configured in various ways. A larger area-per-person enables greater flexibility for settings to be reconfigured.

- o   Provide column free areas where possible. Where columns are necessary, consider at least a 12m by 12m grid at a minimum for 40 seat collaborative learning space.

- o   Recommended area per person may be exceeded in large rooms where AV display sizes will dictate larger margins around the edge of the room, for comfortable viewing angles and sufficient circulation.

3.4   Room ceiling height

Intent

Cater adequately for existing pedagogies using AV displays and futureproof space for new teaching methods.

Requirements

- Floor to floor height of new spaces to be 4.2m, with a minimum ceiling height of 3.0m.

Additional considerations

- o   Larger spaces will require higher ceiling heights, often determined by sightlines.

---

[6] An internal benchmark exercise showed high variance for appropriate square metre rates for collaborative learning space. The Learning Space Rating System Version 2 (Brown, M. Cevetello, J., et al.. (2017)) outlines between 2.23m2 to 3.25m2 as a range, depending upon tools/uses of the space. The CLSDR takes a conservative approach based on these findings. These figures correlate to the Learning Space Roadmap (2018, p.6)

- o Consider higher ceiling heights to futureproof as smaller rooms may be amalgamated in future to cater for changes in demand.

- o The *NCC Volume 1, F3* requires Class 9b to be a minimum of 2.4m for spaces serving 100 or less persons and 2.7m for spaces serving greater than 100 persons. Bulkheads (typically accommodating air-conditioning ducts) that are lower than these heights require a performance based assessment of this criteria.

- o Consider raising ceilings in existing spaces that have low ceilings. Services must be carefully designed to create a pleasing aesthetic, and acoustic conditions addressed.

3.5 Proximities within space

Intent

Provide an equitable and engaging experience for students whereby all students are in a reasonable proximity to the presenter, and where participants can easily engage in face-to-face interaction.

Requirements

Room proportions and configuration enable students to be as close to the presenter as possible and allows participants to interact easily with each other for group activities.

Additional considerations

- o Students remain more engaged with a class if they are in close proximity to the presenter. There is evidence to suggest being able to perceive the facial expressions of the person speaking to you improves levels of engagement. Speech is also more audible when you are in closer proximity to a speaker and can see their face, not only because of the direction of sound but also visual reinforcement. After 20 metres the ability to recognise a person's facial expressions falls off.[7]

- o Whilst collaborative teaching and learning activities suit non-hierarchical room layouts, being able to return group focus to a presenter is important. Consider how the room layout, furniture selection, even lighting pre-sets can be used to facilitate this re-focusing.

3.6 Circulation through space

Intent

Enable all participants to easily circulate, interact, and form groups to support active engagement between participants (presenters and students), and access technology and tools where provided.

Requirements

Provide adequate space for participants to circulate among key components of the room: entrances, seats, tables, writing surfaces, lectern and displays.

Additional considerations

- o Ensure doorways and circulation space facilitates efficient class changeover.

- o It is preferable for doorways to be located so students coming in late do not disrupt the class or pass the lectern.

- o Allow at least **1.6m** between tables with back-to-back chairs, to facilitate circulation.

---

[7]

- o If mobile/modular furniture is used, ensure there is sufficient room to be able to move the furniture to reconfigure it.

- o Ensure electrical outlets or mobile power poles do not obstruct circulation activity

- o Where possible, apply universal design principles for accessibility.

3.7   Accessibility and universal design

Intent

Create an inclusive, safe and accessible environment for diverse and differently-abled users.

Requirements

- Comply with the *National Construction Code*, *Disability (Access to Premises-Building) Standards 2010* and *AS1428.1 Design for access and mobility*, to the extent they apply to the project.

- Ensure instructor space is accessible, with sufficient circulation behind a lectern to turn a chair 180 degrees, and access a podium.

- Furniture shall accommodate wheelchair access.

Additional considerations

- o Consider both seated height and standing height collaborative tables. Refer *5.2 Work Surfaces (Tables)*

- o Ramps are preferred to motorised lifts.

3.8   Security

Intent

Provide consistent functionality and security across all learning spaces.

Requirements

Provide electronic (swipe card) access at the entrance doors, with delayed action door closers. Refer to *UQ Property and Facilitates Technical Guide – 18 Security* and the UQ Security Technical Office for detailed security requirements.

Additional considerations

- o Electronic mortise locks with integrated key override, free to exit (from inside) at all times are preferred.

- o Locks to be keyed to 'US-A8-4' Assa Abloy. This allows areas such as Examinations the ability to lock certain doors during examination periods outside the time schedule.

- o Electromagnetic locks may be required for double doors. Ensure the location of the locks are considered, and that head heights are sufficient.

- o In refurbishments surface-mounted conduits are not preferred. Consider the route of wiring so it may be concealed.

3.9 Room division

Intent

Create flexible, multifunctional spaces. The requirement for flexibility should not compromise the functionality of a space. Room division should be ancillary to the portfolio requirements.

Requirements

Where rooms are required to be divisible to accommodate various class sizes, provide manually-operable doors with an acoustic rating equivalent to a fixed room divider. Door panels should be able to be manipulated by users of the space quickly, safely and easily.

Additional considerations

- o Ensure the space is laid out so it functions effectively as either a single, larger room, or as smaller rooms.
- o The acoustic suitability for the installation should be verified by an acoustic engineer.
- o Learning spaces do not have full-time service staff to operate doors. If the operation of a door is too difficult or heavy, the doors will not be operated during the day. Ensure door selection is compatible with its intended operation.
- o There should be no key device to manually operate doors as keys can become damaged, easily misplaced, or difficult to operate.
- o Consider other functions for the partitions including writing surfaces, acoustic treatment, projection or transparency.

3.10 Futureproofing

Intent

Maximise the value and longevity of collaborative learning space by enabling it to evolve (without complete refurbishment) with advances in technology and changes in teaching and learning methods.

Requirements

The room design is to support or adapt to changing pedagogies over time.

Additional considerations

- o Consider the potential for reconfigurations, subdivision or amalgamation of spaces in the future.
- o Use wireless solutions for technology, where possible.
- o Provide a grid of power distributed across the floor. Refer *6.2 Electrical Power* for information on Floor Boxes.
- o Consider open-access cable trays or other easily-accessible solutions as an option to facilitate changes of equipment over time.

4. Environmental factors

4.1 Daylight

Intent

Support learning and improve concentration and engagement by providing daylight into learning space.

Requirements

Provide direct access to daylight and the means to control it with sunshades, screens or blinds. Blinds may be blackout if required by the space functions.

Additional considerations

- o Illumination (natural light and artificial lighting) achieves uniformity to provide visual comfort.
- o Glare is eliminated on work surfaces and views to AV displays and instructors.
- o Internal blind control to be motorized and linked to the room's AV control system allowing user control.
- o Refer to *Greenstar – 11 Lighting Comfort* and *12 Visual Comfort* for best-practice standards.

4.2 Views

Intent

Support learning and improve concentration and engagement by providing views to outside from learning spaces.

Requirements

Provide line of sight to the exterior of the building or high-quality internal view (ie. through windows) with quality views that include vegetation, human activity or objects at least 7 metres from the exterior of the window.

Additional considerations

- o Extent of window openings should be balanced with wall space for required writing surfaces and audio visual displays.
- o Refer to *Greenstar – 12 Visual Comfort* for best practice standards

4.3 Transparency

Intent

Showcase learning promoting interactivity, collaboration, building cooperation and sharing of information and ideas. Make the space welcoming by allowing users to visually assess a space upon approach. Improve safety and security.

Requirements

Provide windows between the learning space and adjacent corridors.

Additional considerations

- o A large extent of glazing may not be suitable in all locations. Adjacent uses and room functions should be considered.

- o Window frosting can be used to moderate the amount of transparency where required.

4.4   Sightlines

Intent

Provide adequate visibility from participants to instructors and to course content.

Requirements

Provide unobstructed views for participants to see instructors, to see information on AV displays, writable surfaces and to see one another to engage in discussions.

Additional considerations

- o Provide adequate ceiling height so that the participants can see both the AV display and presenter.

- o The bottom of AV displays should be a minimum of 1200mm from the floor so participants can see over each other's heads.

- o Ensure AV displays utilising projection are positioned to avoid projecting into participant or presenters' eyes.

- o Maximise the ability of participants to face one another for more effective dialogue.

- o Non-hierarchical table layouts are preferred (i.e. not in rows).

- o Enable participants to see all presenters and/or visual displays and/or writing surfaces by turning their chairs up to 180 degrees.

- o Eye contact with the speaker improves speech intelligibility. In part, because being in front of a person is the best location to hear their voice and in part because their facial expression reinforces the verbal content.

- o Collaborative pedagogies do not require long periods of students being lectured to, or copying notes from an AV display. Consider trade-offs between sightlines to presenters and AV display and the ease of supporting group work.

- o If columns are present, ensure they are not located between participant and AV displays or presenter lectern. Ideally collaborative learning spaces would be column free.

- o Room proportions impact sightlines, intimacy and furnishings. Irregular room shapes should be avoided.

4.5   Lighting control

Intent

Ensure optimal flexibility of lighting control appropriate to different learning activities.

Requirements

- Provide sufficient LED lighting for different zones including lecterns, whiteboards and student seating areas.

- Provide dimming capability for separate zones where separate activities occur, such as for the main seating area, lectern, perimeter display or writable surface areas.

- Provide user friendly lighting control via the AV control panel to control saturation and colour temperature as well as brightness.

Additional considerations

- o For lighting control standards for formal learning spaces, refer to UQ AV Projects. Controls are standard across all learning spaces, to enable easy operation of systems in any formal space.

- o Pre-set controls may be set to accommodate a range of different activities anticipated in the space such as presentation, discussion, AV presentation, controlling hue, saturation and colour temperature as well as brightness. Operation of pre-set controls should be piloted as it is not the current standard.

- o If table dividers are used on collaborative tables for the provision of examinations, ensure there is a lighting pre-set that will prevent dark spots/shadows, based on the exam layout.

- o LED dynamic lighting settings moderating lighting temperature (Kelvins) and output has been studied and shown to improve learning outcomes when the instructor matched the lighting setting to the activity. As a minimum 4000K, should be provided in learning space.

- o Light fittings and bulbs should be readily sourced locally rather than from other countries.

- o Refer to *UQ Property and Facilities Technical Guide - 14 Electrical Engineering.*

4.6   Thermal comfort

Intent

Ensure thermal conditions of learning space are conducive to learning.

Requirements

Comply with *ANSI/ASHRAE Standard 55-2013, Thermal Environmental Conditions for Human Occupancy* , to maintain uniform comfortable temperature across the learning space.

Additional considerations

- o Refer to *UQ Property and Facilities Technical Guide - 13 Mechanical Engineering.*

- o Refer to *AS1668.1:2015 - The use of ventilation and air conditioning in buildings Fire and smoke control in buildings.*

- o Refer to *Greenstar – 14 Thermal Comfort* for best practice standards.

4.7   Acoustic quality

Intent

Presenters, audio content and individual or group discussion is to be intelligible to occupants, through effective acoustic design of the learning space.

Requirements

- The acoustic separation of the room from adjacent spaces must be sufficient to minimise crosstalk between rooms.

- The internal ambient noise levels must be suitable for speech intelligibility, from the presenter, audio content and for group discussions.

- The acoustic reverberation is to be at levels to also enable speech intelligibility.

- The acoustic performance of the space must enable participants in all parts of the room to have a comparable listening experience.

- Comply with: Association of Australasian Acoustical Consultants *Guideline for Educational Facilities,* Version 2, 2016. *AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.*

Additional considerations

- o An acoustic engineer may be required to provide additional expertise and advice on particular collaborative learning space projects.

- o Higher performance standards for acoustic separation and ambient noise levels should be required for rooms where video and audio recording is a substantial function of the room.

- o Coordinate physical acoustic design with AV amplification systems. Amplification or other technological interventions may assist in achieving speech intelligibility.

- o Consider the numerous features that contribute to acoustic performance: building envelope, window ratings, door ratings, interior materials, HVAC systems, vibration control, AV systems.

- o Acoustic enclosure up to the floor above (ie. above the ceiling) for sound isolation is preferable to ceiling insulation blankets that make access to the ceiling void for maintenance more difficult, and may not be replaced properly. Do not assume existing partitions are acoustic-rated or continue to the slab above.

- o Consider the reduction in acoustic performance of dividing partitions that occurs at penetrations, recessed fitting, ducts, junctions with external glazing etc., and compensate accordingly in the design detail at these areas.

- o Frameless glass pivot doors do not achieve acceptable acoustic isolation from corridors.

- o Refer to *UQ Property and Facilities Technical Guide - 17 Acoustic Engineering.*

4.8 Environmental quality

Intent

Given the high value the University places on its community and the educational experience it provides, create an environment that promotes engagement in learning activities, where all users feel welcome.

Requirements

Provide an environment that is welcoming, aesthetically pleasing, stimulating, engaging, culturally inclusive,[8] and conducive to learning.

Additional considerations

- o Creating spaces that reflect positive aspects of both the physical and cultural (faculty) context, support the development of students' identity with their academic community. Diversity of space design (a fine grain approach) embodies the diversity of the UQ Community and the campus experience, providing a richer and more engaging and memorable experience.

- o Consider using timber or timber look finishes as timber has been shown in recent studies to engender a sense of wellbeing in occupants.

- o Consider the cultural context that design features may be read, such as colour, motifs, patterns, artworks, etc. For example overly bright monochromatic colour schemes or bold stripes or patterns may make some people physically uncomfortable.

4.9 Sustainable design

Intent

Minimise the environmental impact of collaborative learning space fit-outs throughout its life cycle: manufacture, construction, operation, maintenance and disposal. Create spaces that have indoor air quality with low levels of pollutants for healthier learning environments.

Requirements

- Design spaces to minimise energy consumption, whilst achieving the functional requirements.

- Specify materials and fittings with sustainability credentials (reused or recycled content product, third party certification, stewardship programs) and no to low volatile organic compound (VOC) emissions.

- Employ design strategies to reduce air contamination.

Additional considerations

- o Specify materials and fixtures that are robust with straightforward maintenance requirements, available spare parts, and ongoing supplier product support to extend the life of the fit outs.

- o Optimising indoor air quality requires a multifaceted approach, integrating numerous design strategies not just the air conditioning systems. Refer *ABCB Indoor Air Quality 2018 Handbook, ASHRAE Indoor Air Quality Guide: Best Practices for Design, Construction and Commissioning* and *AS1668.2-1991 The use of mechanical ventilation and air-conditioning in buildings Mechanical ventilation for acceptable indoor-air quality.*

- o Refer *UQ Property and Facilities Technical Guide – 3 Sustainability* for further considerations.

---

[8] Indigenous perspectives may further be explored as part of the University's Reconciliation Action Plan and may warrant additions to this document as advice becomes available.

5.   Finishes, furniture and fit-out

5.1   Furniture configuration flexibility

Intent

Provide furniture that is easily movable and configurable to support a range of learning activities.

Requirements

Provide movable lightweight furniture and ancillary learning tools.

Additional considerations

- o   Consider stackable/nestable chairs and/or tables to provide greater flexibility. This may not be suitable for all spaces. Refer 5.3 *Seating* for further requirements.

- o   Consider modular tables to provide multiple groupings. Modular tables that can be separated into individual desks, or that can facilitate examinations. Refer 5.2 *Work Surfaces.*

- o   Use removable tether cables for tables that need to be soft wired for power and/or data, rather than fixing tables to the floor, so the tables can be reconfigured in the future.

- o   In tiered spaces, consider chairs that move and/or rotate so that participants can more easily collaborate.

- o   Provide a mobile lectern in addition to the fixed lectern, with wireless control of AV, to allow the presenter to position themselves more centrally.

5.2   Work surfaces (tables)

Intent

Provide durable work surfaces to accommodate several devices and participants' materials. To provide tables that facilitate collaboration and discussion.

Requirements

- Provide at least **760mm wide by 600mm deep** area per seat.

- Provide tables on castors.

- Provide a durable finish and edge protection, such as laminate with acrylonitrile butadiene styrene (ABS) edging.

- Provide table shapes that facilitate eye contact, collaboration and discussion between participants.

- Provide a prototype when a new table size, shape or system is being specified.

Additional considerations

- o   Refer 5.1 *Furniture Configuration Flexibility*.

- o   Tables seating 6 are preferred by most disciplines. (1600mm diameter or corner-to-corner of a plectrum-shape table). Tables seating 8-10 may be warranted in larger collaborative spaces. Different table sizes cater for different pedagogies and activities. Providing space with different table sizes in the learning space portfolio is desirable.

- o Consider tables shapes – plectrum, circle, rectangle – how the arrangement may support both discussion at the table but also allow students to focus on a presenter for periods.

- o If using modular tables that can be reconfigured in multiple groupings, integrate magnets to help keep the tables together.

- o Consider using height-adjustable tables where possible. This will accommodate students that may need to stand and can be used to create a tiered space to improve sightlines and connection between participants and presenters.

- o Table leg systems must be robust and ideally situated in the centre of the table not along the edges.

- o Table leg castors should ideally not have castor locks as this can damage the table when moved improperly. Castor locks may apply when the floor surface is hard (i.e. polished concrete).

- o If the tables are height adjustable, flippable for nesting and storage, consider if the operation required is logical, easy and safe. Provide appropriate signage/instruction as necessary.

- o Tables in rooms with video conferencing or AV capture should avoid polished table surfaces or strong saturated colours.

- o Wherever required, table design should allow for examination setup via either:

  a. separable modular tables minimum of 850mm wide by 500mm deep – spacing to be a minimum of 500mm between desks and 600mm at aisles, to allow supervisors to circulate to monitor students, or;

  b. placement of exam dividers on a modular table – allowing a minimum of 850mm wide by 500mm deep per student. Refer 5.7 *Examination dividers.*

5.3 Seating

Intent

Provide robust, comfortable seating that facilitates group activity.

Requirements

- Provide seating that is comfortable for a variety of body types, heights and is ergonomically appropriate.

- Australian Furniture Research Develop Institute (AFRDI) rating Level 6 or equivalent

- Minimum 120kg load rating

- 10 year warranty

- Provide seats on non-lockable castors, no arm rests or tablets and is stackable.

- Provide seats that are light weight, robust with a durable finish (without fabric upholstery).

- Provide a sample when a new chair is being prototyped.

Additional considerations

- o Refer 5.1 *Furniture configuration flexibility.*

- o If standing-height tables are provided, use sled-based drafting seats in place of castors to prevent seats from sliding when a user attempts to sit down or stand up.

- o Provide soft-tyre castors for hard floor surfaces and hard-tyre castors for soft floor surfaces and carpets.

- o   [Good Environmental Choice Label](#) (GECA) certification or similar environmental credentials.

- o   Polypropylene shells with perforations and mesh inserts are preferred. Ergonomically-contoured seats and back supports to be comfortable for 2-3 hours.

- o   Chairs used on other projects on campus are preferred as this enables easy replacement of misplaced furniture from spares storage.

- o   Gas lift chairs with star base should be avoided unless ergonomically necessary for the intended activities.

- o   Generous seat pan size preferred, minimum 440mm width x 420mm depth.

- o   Consider height range of fixed seats to suit application.

- o   Avoid easily-stained or marked finishes and colours. Where mesh or vinyls are used, consider dark colours that will hide marks.

- o   Local retailers with after sales support services are preferred. Consider the lead time of the chairs when specifying to ensure they will be delivered in time.

- o   Provide a gas lift drafting stool for the presenter.

- o   For rooms over 50 seats provide two additional seats for guest presentation. These seats could be uniquely identifiable (a different colour) to minimise their use as table seating and so they aren't accidentally removed by UQ auditors.

5.4   Presenter station (lectern)

Intent

Provide a robust 'base station' for presenters, that is approachable, adjustable and functional. Provide a consistent layout and operation of lecterns (and AV controls) across all learning spaces, to minimise setup time and stress for users.

Requirements

- •   Provide a UQ AV Standard Lectern.

- •   Coordinate the power and data connections to be provided to the lectern with UQ AV Projects.

- •   Provide sufficient space for wheelchair circulation around the lectern or execute an 180º turn behind the lectern.

- •   Locate the lectern to allow presenters to maintain eye contact with students. Lectern should not block sightlines to writable surfaces or AV displays.

Additional considerations

- o   Consider providing a secondary light weight mobile presenter station, to allow presenters to present more centrally or from alternative locations.

- o   Consult with UQ AV Projects for standard lectern diagrams, specification details and manufacturer. Material finishes should be selected to suit the space fit-out.

- o   The AV rack is housed within the lectern itself.

- o   Consider the cable route and management to the lectern. Large bundles of cables with segregation requirements between power and data require generous reticulation and bend radius.

- o   Presenters use the lectern as a place to store their belongings and materials.

5.5 Writable surfaces

Intent

Provide abundant writable surfaces to facilitate interaction for individuals and groups.

Requirements

- Provide a large whiteboard for the presenter which is easily viewable by all participants.

- Provide whiteboards that can be accessed by each table simultaneously for an activity.

- Writable surface to be smooth, nonporous, blemish free, and scratch resistant such as vitreous enamel (porcelain/ceramic) on steel. The surface should be easily cleaned with a proprietary eraser and regular application of a whiteboard cleaning fluid or wipe. Minimum 10 year warranty.

Additional considerations

- o To provide as much writable surface as possible consider:

  - – Surfaces that are both writable and projectable. In small spaces trade-offs between projection area and whiteboard area are often required. Whilst not ideal, a roll down projection screen in front of a whiteboard can allow the use of a whiteboard between uses of projected content, without having to clean the board.

  - – Magnetic surfaces so posters or other materials can be displayed.

  - – Large boards from 720mm to 2300mm in width.

- o Minimal joints between boards is preferred (as joints tend to discolour).

- o If an instructor board cannot be viewed by all participants, do not provide a board (they may inadvertently disadvantage some participants) as presenters can use the visualiser. Whiteboard capture cameras may be another solution to share the whiteboard with all participants.

- o If wall-mounted whiteboards are not possible, provide mobile whiteboards on castors. Adequate storage must be provided for the whiteboards when not in use, in a location that does not impact the functioning of the space.

- o Provide frames around whiteboards or a change of surface level between whiteboard and wall to indicate what is or is not a writable surface, as participants draw off the edge of whiteboards that have seamless edges to wall surfaces.

- o If using vitreous enamel steel mounted on MDF or similar heavy board, ensure the substrate, or framing, will carry the asymmetric load of the boards. If the existing wall is not straight or plumb, provide battens or similar to provide a straight surface for Z-clips to be fixed. Z-clip rails are light gauge metal and will deflect between intermittent packers.

5.6　Signage

Intent

Provide signage to assist users in finding and operating within the learning space.

Requirements

- In accordance with the *UQ Internal Signage Manual* provide:

Sign Code	Description
ID9b	Teaching Space Identification Sign, wall mounted, adjacent to each entry door
ID12e	Teaching Room Layout Notice, wall mounted, in an optimal viewing location inside the room
ST3	Assistive Listening systems, if applicable, inside the room
RG2	Etiquette Sign, wall mounted, back to back with ID9b if on glass wall, otherwise located in an optimal viewing location inside the room
RG3	Lectern Sign, mounted on the lectern (top or side)
RG4	Bin enclosure sign on bins provided outside the learning space (as required)
ID13/ID14	Back of house room identification, if applicable for plant room doors etc.

- Provide digital signage to display timetabling information. For rooms up to 40 seats provide a 10" booking panel. For rooms with 40+ seats provide a 32" display panel with signage player.

Additional considerations

- o　Consider if additional signage is required for wayfinding.
- o　Consider if the building directory signage needs upgrading to incorporate the learning space/s.
- o　Refer to UQ AV Projects for the digital signage specification.
- o　Locate digital signage booking panels beside the door and accessible to users.
- o　Locate digital signage display panels, over 1800mm (to the bottom of the screen) from the floor to maximise visual access for approaching users.
- o　Ensure substrates and framing are adequate to support the weight of digital signage and consider the reticulation of power and data to the signs. Surface-mounted conduits are not preferred.

5.7　Examination dividers

Intent

Provide dividing screens to comply with examinations protocols and facilitate examinations in learning spaces.

Requirements

- Provide robust removable dividers are a minimum of 500mm high from the desk surface x 750mm deep (or as necessary to exclude views by a student to another's exam paper).
- Provide sufficient storage for the dividers where possible, where they can be easily stowed without damage and within safe lifting heights.

Additional considerations

- o   Panels should stack efficiently.

- o   Panels should remain in place and upright after repeated removal and reinstallation.

5.8   Physical storage

Intent

Balance the requirement for storage to minimise clutter and support the functioning of the space against unnecessary storage that uses up valuable floor area.

Requirements

- Storage cabinetry for student belongings is <u>not</u> provided.

- Instructor belongings should be housed in or around the instructor station.

- Provide storage for examination dividers if required.

Additional considerations

The following storage options could be considered:

- o   Storage for nesting of movable whiteboards or tables. An open area of the room is suitable in most cases.

- o   Laptop storage on collaborative tables or laptop carts/trolleys. Refer 6.9 *Personal Computers.*

- o   Cabinetry for specialist artefacts, resources, teaching kits for various disciplines (usually in school controlled spaces)

- o   Student belongings may be housed in the chair base.

5.9   Waste disposal

Intent

Provide easy access to waste disposal to encourage users to keep learning space clean.

Requirements

Provide a double cabinetry enclosure for general waste and recycling receptacles, closely located outside learning spaces.

Additional considerations

- o   One double bin enclosure may cater for several co-located learning spaces.

- o   Locate the bin enclosure within clear sight of the entry to the learning space, to encourage users to dispose of waste prior to entering the room.

- o   It is preferable that the enclosure accommodates two 240L wheelie bins. Smaller bins may be acceptable in small spaces.

- o   Bins should be able to be pushed into the enclosure and the design should ensure the waste goes into the bin, not between the door and bin.

- o   Each receptacle should be labelled with appropriate signage. Refer *5.6 Signage.*

o   UQ Cleaning provide Desktop Mini Bins to be located at each lectern for small waste items.

5.10   General finishes

Intent

Provide high quality finishes for the lifespan of the fit out and contribute positively to the environmental quality of the space.

Requirements

- Durable.

- Low maintenance and/ or easy to maintain (for example carpet requires frequent vacuuming to maintain its appearance and function however this maintenance is considered easy).

- Contribute low or no VOCs.

- Comply with the UQ Property and Facilities Design Guidelines.

Additional considerations

o   Ensure all finishes meet the applicable Fire Group rating required by the *NCC C1.10 Fire hazard properties*.

5.10.1   Wall finishes

o   Provide chair rails or other treatment (e.g. soft or hard acoustic panelling, whiteboards, wall vinyl) of protecting non-masonry finishes in rooms with moveable furniture.

o   Wall finishes should not include large areas of high-contrast repetitious patterns (such as stripes), as they are problematic for video-conferencing and/or for room occupants. Immersive, strong colour schemes, whilst graphically dramatic, have been similarly problematic, e.g. all yellow rooms.

o   For videoconferencing/AV capture, wall finishes should preferably have 40% to 60% reflectance. Use neutral colours and avoid black, (brightly lit) brilliant white or saturated colours such as orange, yellow, green or red. Do not use polished metal surfaces that may cause 'hot spots'.

5.10.2   Floor finishes

o   Floor covering choices include carpet tile, resilient flooring, polished concrete or similar. The acoustic properties of the finish must be considered in the holistic design of the space that also takes into consideration noise generated by class change over, late comers and the impact on other spaces.

o   With carpet tile colours consider colours and patterns that conceal marks. Carpets are cleaned each night so spills/soiling may not be cleaned until many hours later. Specialist cleaning may be days/weeks away.

5.10.3   Ceiling finishes

o   Ceiling finishes to be matte and sound-absorbing. Preference is given to a solution that is easily removable or provides easy access to services. The ceiling finish should be serviceable i.e. easily cleanable and, if designed to be removable, easily removed.

o   Avoid use of custom ceiling tiles that are difficult to source or replace.

o   Ceiling space is to be easily accessible for service and maintenance of lighting, learning technology, and other systems.

6.   Technology and tools

6.1   Technology and tools coordination

Intent

Provide a space that achieves the user functional requirements, UQ AV Projects quality standards and is coordinated with the architecture and services.

Requirements

- Coordinate the design layout of all applicable technology and tools with UQ AV Projects, commencing with sketch design of the AV layout. The level of engagement with the AV Projects team will depend upon the complexity of the equipment required.

- Provide substrates or structure to support the physical loads of equipment. Projector mounting solutions must be coordinated to ensure the projector does not shake.

- Set-out AV equipment in design, to scale, in required locations, to ensure co-ordination with other services (to avoid conflicts).

- Retrofitted cables cannot be reticulated in the storey/room below the learning space.

Additional considerations

- o   Refer to *2.2.6 Audio visual integration.*

- o   UQ AV Projects will supply an AV brief including a list of equipment to be used, AV responsibilities, building contractor responsibilities and cabling schedule for incorporation in the design documentation.

- o   AV equipment supply and fit-off is carried out by AV Projects. Installation of cabling and terminations is the responsibility of the building contractor, in accordance with the design documentation.

- o   Consider cable reticulation, bundle size and bend radius as surface mounted conduits are not preferred. In refurbishments, P&F does not allow cables to be reticulated in the room below the learning space.

6.2   Electrical power

Intent

Ensure that as many participants in a space have access to electrical power as possible to support the variety of technologies used in learning activities.

Requirements

Provide convenient access to electrical power for end-user devices through dedicated power at participants' location or via charging stations in the room. Provide both three prong 240V, USB-A and USB-C sockets.

Additional considerations

- o   Outline a range of desirable or anticipated activities and their power requirements to determine appropriate capacity for a range of usage scenarios.

- o Use a distribution grid in the floor to provide flexibility in positioning power receptacles and to accommodate multiple layout options.

- o Provide appropriate receptacle locations or cable management raceways such that cables do not obstruct traffic paths.

- o Explore inductive charging options and 'fast charge' battery stations in proximity to learning space clusters.

- o Avoid umbilicals hung from the ceiling as they impact sight lines and detract from aesthetics.

- o Light-weight power poles can be incorporated into refurbished or renovated spaces to provide additional power options to students. Power poles still rely on perimeter power and therefore have trip hazard considerations. Using a cord protection item to minimise trip hazards is beneficial.

- o If there are any soft-wired solutions, ensure the appropriate testing and tagging as per the UQ Electra-safe guidelines.

- o Surface-mounted floor boxes should be avoided as they limit room layouts and present a trip hazard.

- o If floor boxes are used, they must have robust lids, and adequate cable access hatches for the intended purpose, so the larger lid may be fully closed. The design layout and quantity of power outlets should deter those from trying to utilise floor boxes for power. Floor boxes should be used to provide power to soft-wired desk outlets that are robust and easy to use.

- o For table mounted power, use robust fixed outlets with a slightly raised profile or clearly visible under-desk modules. Avoid surface-mounted modules that obstruct sharing materials over the desk, desk troughs with outlets which get filled with litter and dust, or outlets with operable parts that get broken.

- o Skirting/electrical ducts where necessary (surface-mounted skirting ducts collect dust and are frequently damaged) must have clip in covers (not drop-in covers), in long lengths.

6.3   Network connectivity

Intent

Enable all participants to access wireless or hardwired network solutions to support a range of learning activities.

Requirements

- Provide wireless connectivity with appropriate bandwidth, latency, and capacity to support connections for all occupants, including guests using laptops and mobile devices.

- Wi-Fi access points are to be in visible locations, and must not be concealed in ceiling voids.

- Provide wired connectivity to strategic areas of rooms that require high-bandwidth/low-latency connections that cannot be served appropriately by a wireless network.

Additional considerations

- o Outline a range of desirable or anticipated activities and their potential bandwidth requirements to determine appropriate bandwidth capacity.

- o Determine cable connectivity requirements at strategic points (e.g. presenter lectern, participant clusters, etc.) to allow for several different configurations.

o   Design flexibility into the system to allow for increased connectivity as required by course curriculum.

6.4   Visual displays

Intent

Enable sharing of visual data by all participants that is visible and readable.

Requirements

- Provide multiple visual displays of a standard appropriate to the intended room use, function, layout, dimensions and content types.

- Displays should allow multiple input with the ability to adapt easily to evolving cabling and input standards.

Additional considerations

o   Refer *6.7 Audio visual interface and control*

o   Display size and viewing angles must suit the intended room use. Collaborative learning activities typically do not involve long presentations with students taking notes (like traditional lectures) therefore the ideal viewing angles prescribed for a lecture theatre may be relaxed.

o   Projection screen aspect ratio is 16:9.

o   Max seating distance = screen height x 5.5. Final screen size is to be confirmed with AV Projects.

o   Participants should be able to view a display within 45 degrees to each side from the centre of the screen and the top of the screen within 35 degrees above eye level.

o   The bottom of a projected image or display should be at least 1200mm from the finished floor.

o   Provide lighting controls and window treatments to control ambient light conditions at projection locations to avoid glare and washing out image definition. Use of LCD screens reduces the amount of light exclusion required, however glare and reflections still need to be controlled.

o   Coordinate services with display locations to ensure other services do not obstruct the projection or view of the display.

o   If painted plasterboard is to be used as a projection surface, it should be finished in a flat white paint with plaster finish to 'Level 5 Finish" in accordance with *AS/NZS 2589.1:1997*. If whiteboards are used, they are to have a low reflectance surface designed for projection.

6.5   Audience participation

Intent

Enable instructors and participants, both in class and remotely, to hear, see and communicate clearly in support of learning and teaching activities.

Requirements

- Inclusion of a presenter camera (web cam via lectern) and room view camera (PTZ or high res fixed, wall mounted) to display video of all occupants in the room. Camera locations to be coordinated with UQ AV Projects.

- Coordinated acoustic design and amplification to enable all participants in a learning space to hear clearly and easily.

- Dedicated lapel and handheld microphone stationed within a charging unit on the lectern.

- Audience microphones via ceiling arrays to pick up group discussion for live streamed/recorded sessions.

- Assistive listening system for users with hearing aids.

Additional considerations

o The physical acoustic design of the room is crucial, even with amplification. Poor room acoustics such as flutter echo or excessive reverberation times cannot be overcome with amplification.

o Refer to _ANSI/ASA S12.60-2010 / Part 1_ for classroom audio distribution systems for uniformity of coverage and sound pressure levels.

o Consider additional lapel and handheld microphones for larger rooms where there would be a higher population of occupants.

o Refer _5.6 Signage_ for required standard signage.

6.6   Session capture and access

Intent

Record presentations, group interactions or conversations and make these artefacts accessible via recording system on the Learn.UQ website.

Requirements

Capture audio and AV display content, linked to the recording system.

Additional considerations

o Integrate session capture controls with room AV controls.

o Consider the environmental qualities of the room. Acoustic qualities will impact the quality of the recording.

6.7   Audio visual interface and control

Intent

Enable participants to seamlessly manage audio-visual content across multiple output systems including displays, computers and mobile devices, across all learning spaces.

Requirements

- Provide user friendly, graphical user interface controls for equipment and provides consistent navigating methodology / interface across all learning spaces.

- Provide room pre-settings that allow for one-touch control of display, lighting, window treatment, amplification and other tools, as applicable.

Additional considerations

Where applicable to the functions of the room consider providing:

- o the ability to manage content across personal devices, team displays and room displays.

- o the ability to manage access to control capabilities for shared resources.

- o interface control from student devices as well as instructor control points.

- o the ability to introduce content to entire group using personal device or other sources.

- o the ability to share content easily with each other, one-on-one, or with small groups in collaborative learning interactions.

6.8   Occupancy cameras

Intent

Monitor occupancy in real time to improve utilisation via timetabling systems and protocols, and to potentially inform curriculum development and policy decisions.

Requirements

- Provide occupancy cameras in each room, linked to utilisation dashboards. Locate the camera(s) to enable full capture of room occupants.

- Coordinate camera requirements with UQ AV Projects.

6.9   Student computers

Intent

Ensure students have access to computers, where software or hardware requirements are specialised, to support a variety of learning activities.

Design requirements

Provide personal computers of a specification appropriate for the intended activity, where required.

Additional considerations

- o Provision of computers should be assessed on a case-by-case basis. The university is moving towards a Bring Your Own Device (BYOD) strategy and rooms should be designed to function with student devices rather than computers provided.

- o To support BYOD, rooms should have ample power and network solutions.

- o Where functional requirements permit, consider providing laptops via trolleys so laptops can be stowed away and secured when not required. Alternatively, provide laptops that can be stowed under the desk or raised section of the desk, so that other activities can occur.

References

Association of Australasian Acoustical (2018, January). *Consultants Guideline for Educational Facilities Version 2.0.* Retrieved from
https://aaac.org.au/resources/Documents/Public/Educational%20Facilities%20Acoustics%20V2.0.pdf

America National Standard (2015, April). *ANSI/ASA S12.60-2010 PART1 Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools*. Retrieved from
https://global.ihs.com/doc_detail.cfm?&document_name=ANSI%2FASA%20S12%2E60%20PART%201&item_s_key=00585043

American Society of Heating, Refrigerating and Air-Conditioning Engineers (2017). *ANSI/ASHRAE Standard 55-2013, Thermal Environmental Conditions for Human Occupancy.* New York :The Society, Retrieved from https://www.ashrae.org/technical-resources/bookstore/standard-55-thermal-environmental-conditions-for-human-occupancy

American Society of Heating, Refrigerating and Air-Conditioning Engineers (2009). *ASHRAE Indoor Air Quality Guide: Best Practices for Design, Construction and Commissioning.* New York :The Society, Retrieved from
http://cms.ashrae.biz/iaqguide/pdf/IAQGuide.pdf?bcsi_scan_C17DAEAF2505A29E=0&bcsi_scan_filename=IAQGuide.pdf

Australian Building Codes Board (2019). *National Construction Code Volume One.* Commonwealth of Australia and the States and Territories, the Australian Building Codes Board. Retrieved from
https://ncc.abcb.gov.au/ncc-online/NCC

Australian Building Codes Board (2018). *ABCB Indoor Air Quality 2018 Handbook.* Commonwealth of Australia and the States and Territories, the Australian Building Codes Board. Retrieved from
http://www.abcb.gov.au/-/media/Files/Resources/Education-Training/11HandbookIndoorAirQuality2018.pdf

Australian Building Codes Board, Attorney-General's Department (2010). *Disability (Access to Premises – Buildings) Standards 2010*, Commonwealth of Australia and the States and Territories, the Australian Building Codes Board

Brown, M. Cevetello, J., Dugdale, S., Finkelstein, A. Holeton, R., Long, P. and Meyers, C. (2017, February) *Educause Learning Initiative: Learning Space Rating System Version 2.* Retrieved from
https://www.educause.edu/eli/initiatives/learning-space-rating-system

Dougdale, S. (2009). "Space Strategies for the New Learning Landscape", *EDUCAUSE Review.* Retrieved from
https://www.researchgate.net/publication/234747657_Space_Strategies_for_the_New_Learning_Landscape

Greenstar (2017). *Greenstar-Design & As Built v1.2.* Retrieved from https://new.gbca.org.au/green-star/rating-system/design-and-built/

Property and Facilities Division (2014). *Property and Facilities Design Guidelines and Technical Guides, Edition 3 July 2014.* Brisbane: The University of Queensland.

Standards Australia. (2009). *AS1428.1-2009 Design for access and mobility-General requirements for access – New building work.* Retrieved from http://www.saiglobal.com

Standards Australia. (1997). *AS/NZS 2589.1:1997 Gypsum linings, Application and finishing.* Retrieved from http://www.saiglobal.com

Standards Australia (2015). *AS/NZS 1668.1:2015 The use of ventilation and air conditioning in buildings Fire and smoke control in buildings.* Retrieved from http://www.saiglobal.com

Standards Australia (1991). *AS1668.2-1991 The use of mechanical ventilation and air-conditioning in buildings Mechanical ventilation for acceptable indoor-air quality.* Retrieved from http://www.saiglobal.com

Standards Australia (2016). *AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.* Retrieved from http://www.saiglobal.com

The University of Queensland (2018). *Strategic Plan 2018-2021.* Brisbane: The University of Queensland

The University of Queensland (2017). *St Lucia Campus Master Plan: December 2017.* Brisbane: The University of Queensland

The University of Queensland (2016). *Student Strategy 2016-2020.* Brisbane: The University of Queensland

Urbis (2017). *St Lucia Campus Master Plan: December 2017.* Brisbane: The University of Queensland

Appendix A **Design checklist**

Project Name:

Design Consultants:

Indicate if you have complied with the design requirements. Provide this completed checklist to the Project Manager. Non-compliance is to be signed-off by the nominated client representative/s.

Collaborative Learning Space Design Requirements Section/Chapter	Comply	N/A	Non-compliance
3	**Planning and layout**			
3.1	Locality	•	•	•
3.2	Adjacent waiting & informal learning space	•	•	•
3.3	Space density	•	•	•
3.4	Room ceiling height	•	•	•
3.5	Proximities within space	•	•	•
3.6	Circulation through space	•	•	•
3.7	Accessibility and universal design	•	•	•
3.8	Security	•	•	•
3.9	Room division	•	•	•
3.10	Futureproofing	•	•	•
4	**Environmental factors**			
4.1	Daylight	•	•	•
4.2	Views	•	•	•
4.3	Transparency	•	•	•
4.4	Sightlines	•	•	•
4.5	Lighting control	•	•	•
4.6	Thermal comfort	•	•	•
4.7	Acoustic quality	•	•	•
4.8	Environmental quality	•	•	•
4.9	Sustainable design	•	•	•

Collaborative Learning Space Design Requirements Section/Chapter	Comply	N/A	Non-compliance
5	**Finishes, furniture and fit-out**			
5.1	Furniture configuration flexibility	•	•	•
5.2	Work surfaces (tables)	•	•	•
5.3	Seating	•	•	•
5.4	Presenter station (lectern)	•	•	•
5.5	Writable surfaces	•	•	•
5.6	Signage	•	•	•
5.7	Examination dividers	•	•	•
5.8	Physical storage	•	•	•
5.9	Waste disposal	•	•	•
5.10	General finishes	•	•	•
6	**Technology and tools**	•	•	•
6.2	Electrical power	•	•	•
6.3	Network connectivity	•	•	•
6.4	Visual displays	•	•	•
Error! Reference source not found. Audience participation	•	•	•
6.7	Audio visual interface and control	•	•	•
6.6	Session capture and access	•	•	•
6.8	Occupancy cameras	•	•	•
6.9	Student computers	•	•	•

Contact details

Matthew Scott – T&L Project Manager (Learning Space)
Institute for Teaching and Learning Innovation

T   +61 7 **3443 1695**
M   +61 **0431 808 471**
E   learningspace@uq.edu.au
W   itali.uq.edu.au

CRICOS Provider Number 00025B