



Transformation Of Office Interior Design Before and After Covid-19: A Comparative Study of Architecture and Interior Design Studios

¹Swasti Jain, ²Mrs. Sucheta Nigam

^{1/2}B. Des (Interior Design), Sanjeev Agrawal Global Educational [SAGE] University, Bhopal

ABSTRACT

The COVID-19 pandemic disrupted established patterns of office attendance and accelerated the adoption of remote communication and hybrid work. Its longer-term significance for office design, however, extends beyond infection-control measures. It has prompted organisations to reconsider what the physical workplace should enable, how space is occupied, and how employees experience the environments in which they work. These questions are particularly important in architecture and interior design studios, where digital production coexists with activities that depend on physical resources, including material inspection, drawing reviews, model making, pin-up discussions and client presentations.

This paper examines the transformation of architecture and interior design studio environments across three periods: before, during and after the COVID-19 disruption. It adopts a qualitative, literature-based comparative approach and synthesises research on hybrid workplaces, activity-based offices, office performance, user experience and post-pandemic renovation. The review indicates that flexibility and collaboration may offer benefits, but they do not automatically improve concentration, privacy, autonomy or productivity. Consequently, the paper argues against treating shared desks or open-plan layouts as universal solutions.

To address the specific requirements of design studios, the paper proposes a Studio Activity–Space–Experience (SASE) framework. The framework links professional activities to spatial settings, user-experience criteria and operational performance measures. It considers situations such as fluctuating attendance, intensive computer-based production, physical model development, confidential client meetings, hybrid design reviews, material-library use and constrained renovation budgets. The framework is intended as a practical decision-support approach for designers, studio owners and facility managers. It can inform space planning, furniture selection, technology integration, environmental design and post-occupancy evaluation.

The paper does not claim to report completed field measurements or survey findings. Rather, it establishes a research framework that can be tested through case studies of selected studios, particularly within the Indian context. Its principal contribution is the integration of studio-specific workflows with spatial planning and user experience, offering a more focused basis for evidence-informed workplace design.



Keywords: post-pandemic workplace; architecture studio; interior design studio; hybrid work; activity-based working; human-centred design; spatial performance; workplace adaptability; user experience.

1. INTRODUCTION

1.1 Background

Office interiors are not neutral containers for work. Their spatial organisation, furniture, environmental conditions, circulation, technology and access to shared resources influence how people perform tasks, communicate and experience the working day. In architecture and interior design studios, these relationships are especially visible because the work process moves between individual concentration and collective creative activity.

A typical design studio may accommodate computer-aided drafting and modelling, conceptual development, material research, physical model making, drawing coordination, project reviews, client meetings, printing, storage and informal knowledge exchange. Each activity has different spatial and environmental requirements. Detailed digital work may require a stable workstation, controlled glare and acoustic comfort, whereas a design review may require a large table, display surface, movable seating and shared visibility of drawings or models.

Before 2020, many studios relied on regular attendance, assigned desks, shared project tables and face-to-face communication. These arrangements supported continuity and immediate access to colleagues and resources, but open-plan environments could also expose users to noise, interruptions and limited privacy. The COVID-19 pandemic interrupted these established patterns through lockdowns, remote work and restrictions on physical gathering. Digital meetings and cloud-based coordination became more prominent, while the value and purpose of the physical office were reconsidered.

The post-pandemic period should not be understood as a single, uniform design phase. Studios differ in size, location, client base, project type, staff composition, technology, financial capacity and the proportion of work that can be completed remotely. Some activities can be undertaken away from the studio; others remain dependent on physical materials, specialist equipment, shared review and direct interaction. The design question is therefore not simply whether offices should be open, closed or hybrid. It is how the physical environment can support a changing combination of activities without sacrificing user comfort or operational effectiveness.

1.2 Rationale for Focusing on Design Studios

General workplace research provides important evidence about hybrid work and office concepts, but design studios have a distinctive operational profile. Their physical resources—sample collections, drawing and pin-up surfaces, plotters, mock-up materials, models and project archives—may be difficult to replace with digital equivalents. At the same time, design professionals increasingly use digital modelling, remote coordination and online client communication. This combination creates a useful context for examining the relationship between work activity and spatial design.



1.3 Study Orientation

The paper treats the office as a working system composed of people, activities, spatial settings, environmental conditions, technology and resources. It evaluates design strategies according to their fit with actual tasks rather than assuming that one workplace typology is inherently superior.

2. RESEARCH PROBLEM AND RATIONALE

The central problem is the potential mismatch between conventional studio layouts and changing patterns of work. A studio planned around fixed attendance may contain underused desks on some days and insufficient collaborative or meeting facilities on others. Conversely, a studio that moves too quickly towards shared desks may create difficulties for employees who need specialist equipment, personal project storage, continuity or a predictable work setting.

This mismatch is not resolved by adding flexible furniture alone. Effective adaptation requires consideration of workflow, occupancy patterns, circulation, acoustics, lighting, ventilation, privacy, accessibility, digital infrastructure, material storage and the management of shared resources. Design decisions may also create trade-offs. Increasing collaborative space can reduce the area available for focused work; removing partitions may improve visual openness while increasing distraction; reducing desk numbers may lower space costs but create congestion during peak attendance.

The research problem is therefore framed as follows: How can architecture and interior design studios translate changing work practices into spatial arrangements that balance creative collaboration, individual concentration, physical design processes, environmental quality and efficient use of resources?

2.1 Significance

1. Design significance: offers a task-led basis for zoning, furniture selection and spatial allocation.
2. User significance: foregrounds comfort, privacy, accessibility, concentration, control and choice.
3. Operational significance: encourages space decisions based on actual occupancy and workflow rather than assumptions.
4. Commercial significance: helps studio owners and clients compare renovation priorities, resource needs and potential long-term value.
5. Educational significance: provides interior design students with a structured method for analysing workplace environments.
6. Environmental significance: encourages adaptive reuse of existing offices and careful selection of durable, repairable and reconfigurable elements.

3. AIM, OBJECTIVES AND RESEARCH QUESTIONS

3.1 Aim

To develop a human-centred, activity-responsive framework for analysing and guiding the transformation of architecture and interior design studio environments before and after

COVID-19, with attention to spatial planning, furniture, physical design resources, technology, indoor environmental quality, user experience and operational performance.

3.2 Objectives

1. To identify key spatial and functional characteristics commonly associated with pre-pandemic design studios.
2. To examine how remote and hybrid work have changed the purpose and patterns of physical office use.
3. To compare the spatial requirements of focused digital work, collaborative design, material exploration, model making and client interaction.
4. To evaluate the opportunities and limitations of flexible and activity-based workplace arrangements.
5. To examine the role of ergonomics, acoustic privacy, daylight, ventilation, thermal comfort and accessibility.
6. To identify the implications of digital collaboration for meeting spaces, power, connectivity and presentation facilities.
7. To propose the Studio Activity–Space–Experience (SASE) framework as a decision-support structure.
8. To establish a practical evaluation approach that can be applied to selected studios through future fieldwork.

3.3 Research Questions

1. How have the spatial organisation and functional priorities of architecture and interior design studios evolved across the pre-pandemic, pandemic and post-pandemic periods?
2. Which studio activities require dedicated physical settings, and which can be supported through flexible or shared environments?
3. How can a studio balance collaboration with privacy, concentration and individual control?
4. How do hybrid work patterns affect workstation allocation, material libraries, model-making areas and meeting facilities?
5. Which environmental and ergonomic conditions are most relevant to the usability of contemporary design studios?
6. How can digital tools complement rather than displace physical design resources?
7. What criteria can studio owners and interior designers use to evaluate the effectiveness and commercial practicality of a proposed redesign?

4. SCOPE AND DELIMITATIONS

4.1 Subject Scope

The study focuses on interior environments of architecture and interior design studios. It considers spatial planning, workstation arrangements, collaboration, quiet work, material libraries, model-making facilities, storage, presentation areas, technology, ergonomics and indoor environmental quality.

4.2 Temporal Scope

Period	Working definition	Analytical emphasis
Pre-pandemic	Common workplace practices before the widespread disruption of 2020.	Regular attendance, assigned workstations, face-to-face coordination and established studio resources.
Pandemic disruption	The period of lockdowns, restrictions and rapid remote-work adaptation.	Remote coordination, reduced occupancy, digital communication and temporary operational adjustments.
Post-pandemic	The period after emergency restrictions, including continuing hybrid and flexible arrangements.	Reassessment of office purpose, activity-based settings, environmental quality and user-centred adaptation.

4.3 Geographical and Contextual Scope

The framework is intended to be applicable to architecture and interior design studios in India, with Bhopal, Madhya Pradesh, identified as a relevant context for future case-study work. Local application should consider climate, building orientation, daylight availability, air quality, power reliability, internet access, rental conditions, construction practices and the financial capacity of small and medium-sized practices. The present paper does not claim to represent all Indian studios.

4.4 Delimitations

The paper does not compare every office sector, establish a universal post-pandemic layout, prescribe a fixed desk-sharing ratio, or claim measured improvements in productivity. It focuses on design implications for studio environments and proposes how these can be tested.

5. REVIEW OF LITERATURE

5.1 Activity-Based Workplaces and Task Diversity

Activity-based workplaces provide a range of settings intended to support different work tasks, such as focused work, meetings, collaboration and informal interaction. Oygür, Göçer and Ergöz Karahan (2022) discuss the evolution of activity-based office design and the way pandemic experiences have reshaped employees' expectations of workplace use. Their perspective is relevant because it highlights the importance of listening to users rather than treating flexibility as a purely spatial or cost-saving exercise.

For design studios, activity-based thinking can be translated into a more specific task map. A single open work area may not be equally suitable for CAD work, confidential client calls, physical model making and group critique. The design challenge is to provide choice without creating excessive fragmentation, confusing circulation or unmanageable space requirements.



Typical studio layout before COVID-19 – fixed workstations, open plan, and face-to-face collaboration.



Post-pandemic studio – flexible workstations, collaborative spaces, hybrid meeting facilities, and improved comfort.

5.2 Hybrid Work and Post-Pandemic Renovation

Aksamija and Milosevic (2023) investigated renovation strategies for two office spaces at an academic institution adapting to hybrid work. Their mixed-method approach combined documentation of existing conditions, user input, surveys, focus groups and spatial analysis. The study demonstrates the value of linking design proposals to actual work patterns and user requirements. It also provides a methodological precedent for a studio-based investigation that combines measured drawings with participant feedback.

The implication for this paper is that a successful redesign should begin with an assessment of existing conditions and users' activities. Renovation should not be driven by visual trends alone. The design response should be checked against circulation, accessibility, daylight, team requirements and the functional limitations of the existing building.



5.3 Workplace Concepts, Performance and Trade-Offs

Gerlitz and Hülsbeck (2024) reviewed empirical research on open-plan offices, activity-based working and single-office concepts. Their review highlights that office concepts can have different consequences for performance, satisfaction and health. It cautions against evaluating workplace design solely through real-estate efficiency or the presumed benefits of interaction. This is particularly relevant to studios, where concentrated technical work may be interrupted by noise and movement.

Lauterbach and Borge (2026) provide a recent meta-analytic review of activity-based offices, integrating 133 effect sizes from 35 studies and 7,959 participants. They report increased physical activity and coworker contact, alongside reduced work stress in the pooled evidence, but also increased job demands; privacy and autonomy outcomes remain uncertain. Their findings reinforce the need to treat activity-based design as conditional rather than universally beneficial.

5.4 Privacy, Communication and Concentration

Research on office layout has repeatedly identified a tension between communication and privacy. Kim and de Dear (2013) examined the privacy–communication trade-off in open-plan offices. The wider implication for studio design is that visual openness does not automatically produce effective collaboration. A studio may require settings where teams can exchange ideas, as well as places where employees can concentrate, undertake detailed drawing work or discuss confidential project information.

The design response should therefore provide a spectrum of settings: open project tables, enclosed meeting rooms, semi-enclosed focus areas and acoustically protected spaces for calls. The number and size of these settings should be informed by observed use, not by a generic office template.

5.5 Indoor Environmental Quality and Health

Indoor environmental quality includes ventilation, thermal conditions, lighting, acoustics and other factors that shape occupants' experience. The World Health Organization (2021) issued a roadmap for improving ventilation in indoor environments in the context of COVID-19. While infection prevention is not the sole purpose of contemporary office design, the pandemic increased attention to the relationship between occupancy, ventilation and indoor air conditions.

For design studios, ventilation and thermal comfort should be considered alongside workstation density, room depth, partitions, equipment loads and local climate. Daylight and glare control are also important for screen-based drafting, colour assessment and material inspection. Acoustic conditions affect both concentration and the intelligibility of hybrid meetings.

5.6 Critical Synthesis

The literature points to four conclusions. First, workplace flexibility can support a range of activities, but its success depends on the fit between spatial settings and actual work. Second, collaboration should not be pursued at the expense of concentration, privacy or user control. Third, renovation decisions are stronger when informed by user participation and analysis of

existing conditions. Fourth, environmental quality remains a core design requirement rather than a temporary response to a public-health emergency.

A limitation in the existing body of work, for the purposes of this paper, is that general office findings cannot automatically be transferred to architecture and interior design studios. Studio workflows combine digital and physical production, specialist equipment, material resources and iterative visual review. These characteristics justify a more focused analytical framework.

6. CRITICAL SYNTHESIS AND RESEARCH GAP

The research gap is framed as a context-specific and methodological opportunity, not as a claim that post-pandemic office design has not previously been studied. Existing studies have examined hybrid workplaces, activity-based offices, renovation, employee perceptions and office performance. However, the literature reviewed for this paper does not, by itself, provide a consolidated studio-specific tool that links the full sequence from professional activity to spatial provision, user experience and operational evaluation.

6.1 Identified Gap Areas

Studio workflow specificity: the relationship between digital production and physical activities such as material review, model making, pin-up critique and sample storage requires focused spatial analysis.

Activity-to-space translation: general recommendations for flexibility need to be translated into clear design decisions about workstation types, room settings, storage and adjacency.

Trade-off evaluation: collaboration, concentration, privacy, accessibility and space efficiency should be assessed together rather than as isolated design goals.

Local application: small and medium-sized Indian studios may face constraints involving floor area, renovation budgets, building services, climate and technology access that are not represented by every international case study.

Evidence-to-design connection: a practical method is needed to connect user feedback and site observations to measurable design criteria and post-occupancy evaluation.

6.2 Research Novelty and Contribution

The proposed contribution is the Studio Activity–Space–Experience (SASE) framework. It is designed specifically for architecture and interior design studios and integrates four linked dimensions: (1) professional activity, (2) spatial response, (3) user experience and (4) operational performance. The framework does not claim to be empirically validated. Its originality lies in its proposed application and synthesis; validation would require testing across selected studios and comparing the framework's recommendations with observed outcomes.

6.3 Proposed Research Proposition

A studio interior is more likely to support effective work when its spatial settings are aligned with the activities performed, the environmental conditions required and the experiences reported by its users, rather than being organised solely around a fixed desk count or a generic preference for open-plan or flexible layouts.

7. CONCEPTUAL FRAMEWORK: THE SASE MODEL

The SASE framework is proposed as a structured design-reasoning tool. It asks the researcher or designer to move from identifying an activity to specifying the space, evaluating the user experience and reviewing operational performance.

Dimension	Core question	Examples of evidence
1. Activity	What work is being performed?	CAD/BIM work, sketching, model making, material selection, team critique, client meeting, administration.
2. Spatial response	What physical setting enables the activity?	Assigned desk, shared workstation, project table, quiet room, sample library, model-making bench, meeting room.
3. User experience	How does the setting affect the person using it?	Comfort, privacy, concentration, accessibility, control, safety, ease of collaboration.
4. Operational performance	Does the setting work reliably and efficiently?	Occupancy, utilization, storage access, booking conflicts, maintenance, adaptability, cost.

7.1 How to Apply the Framework

List the activities undertaken by each user group and estimate how often, how long and at what times they occur.

Identify the spatial, furniture, equipment, environmental and storage requirements of each activity.

Map existing spaces and record where activities currently take place, including temporary or improvised workarounds.

Collect user feedback on comfort, privacy, concentration, collaboration and access to resources.

Identify conflicts, underused areas, bottlenecks and missing facilities.

Develop more than one layout option and compare each option against the same criteria.

After implementation, conduct a post-occupancy review to determine whether the design performs as intended.

8. RESEARCH METHODOLOGY

8.1 Research Design

The present paper adopts a qualitative, literature-based comparative design. It reviews selected academic publications and official guidance to identify workplace design themes, then uses these themes to construct the SASE framework. A subsequent empirical phase is recommended to test the framework in selected architecture and interior design studios.

8.2 Secondary Data

Secondary data are drawn from peer-reviewed research articles, systematic and meta-analytic reviews, architectural research and official indoor-environment guidance. The sources are selected for relevance to hybrid work, activity-based office design, renovation, workplace performance, user experience and ventilation. This paper is a focused narrative synthesis rather than a registered systematic review; it does not claim exhaustive database coverage.

8.3 Proposed Primary Data Collection

Method	Proposed procedure	Purpose
Site observation	Document zoning, circulation, workstation types, shared resources, lighting, ventilation provisions and acoustic conditions.	Understand how the studio operates in practice.
Measured drawings	Prepare or obtain existing floor plans and record key dimensions where permission is granted.	Compare spatial allocation, adjacency and circulation.
Questionnaire	Invite architects, interior designers, interns, studio managers and support staff to report work patterns and experience.	Identify common user needs and perceived changes.
Semi-structured interviews	Interview studio owners or senior staff about attendance, renovation decisions, budgets and workflow.	Understand organisational and operational context.
Photographic documentation	Photograph relevant spaces only with permission and without exposing confidential project material.	Support visual comparison and documentation.

8.4 Sampling Strategy

Purposive sampling is appropriate because participating studios should have relevant design activities and, where possible, knowledge of their pre-pandemic arrangements. A student-scale exploratory study may select three to five studios, subject to access and time. The number of participants and studios must be reported accurately. A small purposive sample can provide contextual insight but cannot represent every design practice.

8.5 Data Analysis

Qualitative information from interviews and open-ended questionnaire responses can be coded into themes such as flexibility, privacy, collaboration, ergonomics, environmental quality, technology and resource access. Observation records and floor plans can be

compared to identify changes in area allocation, workstation arrangements, adjacencies and circulation. Closed-question responses may be summarised using counts and percentages, provided the actual number of valid responses is stated.

Historical conditions require particular care. If pre-pandemic plans, photographs or records are unavailable, recollections should be labelled as retrospective accounts rather than verified measurements. The researcher should distinguish direct observation, participant testimony, documentary evidence and interpretation.

8.6 Ethical Considerations

Participation should be voluntary and based on informed consent. Respondents should be told the purpose of the study and how their information will be used. Personal names, client details, confidential drawings and commercially sensitive information should not be published without explicit permission. Photographs and plans should be anonymised where required.

9. COMPARATIVE ANALYSIS AND DISCUSSION

The following comparison synthesises common tendencies discussed in the literature. It is not a claim that every studio experienced each change.

Design parameter	Before COVID-19: common tendency	Pandemic disruption	Post-pandemic design consideration
Attendance and occupancy	Regular attendance and relatively predictable desk use.	Remote work and restricted occupancy.	Plan for variable attendance using actual schedules and peak-use information.
Workstations	Assigned desks and personal storage were common.	Home workstations and temporary remote setups.	Combine assigned and shared settings where workflow supports them.
Collaboration	Informal desk-side discussion and in-person reviews.	Online meetings and digital coordination.	Provide project tables and hybrid-ready meeting settings.
Focus and privacy	Often dependent on individual desks or existing rooms.	Home-based concentration for some workers.	Provide quiet rooms, focus settings and acoustic protection.
Material resources	Physical samples and libraries located in the studio.	Restricted access; digital catalogues used where available.	Retain essential physical resources and improve their organisation and cataloguing.
Model making	Dedicated or shared work surfaces and storage.	Access constrained by remote work and restrictions.	Provide safe, well-ventilated work surfaces and storage suited to actual use.

Technology	Digital tools alongside predominantly physical coordination.	Rapid expansion of video meetings and cloud collaboration.	Integrate displays, cameras, microphones, power and reliable connectivity.
Indoor environment	Ventilation, lighting and acoustics were established design concerns.	Greater attention to indoor air and occupancy.	Assess ventilation, thermal comfort, daylight, glare and acoustics together.
Space utilisation	Layouts based on expected daily presence.	Lower or restricted occupancy.	Review actual occupancy and use before changing desk numbers.
Furniture	Stable workstation arrangements and fixed project tables.	Temporary home furniture and altered work routines.	Use adaptable furniture selectively; retain dedicated settings where needed.

9.1 Spatial Planning: From Desk-Centred to Activity-Responsive

A key shift is the possibility of moving from a layout dominated by desk allocation towards a layout that recognises multiple work modes. This does not mean eliminating permanent workstations. A studio with specialist monitors, calibrated displays, physical project files or long-running tasks may require assigned settings. A smaller number of shared or bookable settings may be suitable for activities that occur intermittently. The appropriate mix depends on attendance, task continuity, equipment and user preference.

9.2 Furniture and Ergonomics

Furniture should support the duration and physical demands of the task. Adjustable chairs and desks, monitor positioning, suitable task lighting and adequate legroom remain important for prolonged computer work. Large shared tables can support collaborative drawing and review but should not replace individual work surfaces where detailed production requires them. Movable furniture is useful only when it can be safely moved, stored and reconfigured without obstructing circulation.

9.3 Collaboration and Concentration

Design studios require both collective critique and sustained individual attention. A useful layout provides a gradient of interaction rather than a binary choice between fully open and fully enclosed space. Project tables and pin-up walls can be located near collaborative zones, while quiet rooms and focus desks should be protected from high-traffic circulation. Small rooms for calls and confidential discussions can reduce competition for larger meeting rooms.

9.4 Material Libraries and Physical Production

Material libraries are an important studio resource because designers need to compare texture, colour, finish, scale and physical properties. Digital catalogues can improve search

and documentation, but they cannot fully reproduce the tactile and visual evaluation of physical samples. A practical approach is to combine organised physical sample storage with digital indexing, clear labelling and a process for returning samples. Model-making areas should consider worktop durability, task lighting, ventilation appropriate to materials and processes, waste management and safe storage.

9.5 Indoor Environmental Quality

Ventilation, thermal comfort, daylight, glare, acoustics and indoor air quality should be treated as connected design variables. A partition introduced to improve privacy may affect air movement or daylight. A dense workstation layout may increase occupancy loads. A material workshop may have different ventilation requirements from a computer work area. Design decisions should be coordinated with building services and relevant local regulations.

9.6 Digital and Hybrid Collaboration

Hybrid meetings require more than a screen in a room. Camera position, microphone coverage, lighting, acoustic conditions, display visibility and power access affect participation. A meeting room designed only for people physically present may exclude remote participants from informal discussion or visual material review. In design studios, digital collaboration should support drawing coordination and client communication while preserving physical critique, sample review and model examination.

9.7 Space Efficiency and Cost

Space efficiency should not be equated with reducing the number of desks. An apparently efficient layout may create hidden costs if employees lose time searching for equipment, booking rooms, moving materials or adapting unsuitable settings. A balanced assessment considers usable capacity, peak occupancy, storage, circulation, maintenance, technology and employee experience. Renovation decisions should compare initial cost with expected operational value over time.

10. STUDIO SCENARIOS AND DESIGN RESPONSES

The following scenarios are analytical situations proposed for design testing. They are not reported as observed outcomes from a completed field study.

Situation	Risk or design conflict	Recommended design response	Evidence to collect
1. Peak attendance on a shared office day	Insufficient desks, meeting rooms or circulation capacity.	Use attendance mapping; retain adequate peak capacity; provide bookable project settings.	Peak occupancy, desk conflicts, waiting and circulation observations.
2. Intensive CAD/BIM production	Noise, glare, poor posture and interruptions.	Provide ergonomic workstations, monitor control, task lighting and quiet zones.	User comfort, interruption frequency, workstation assessment.

3. Physical model-making deadline	Dust, material clutter, safety and lack of storage.	Create a designated robust workbench with process-appropriate ventilation, task lighting and storage.	Frequency of use, storage demand, safety and maintenance records.
4. Material selection with clients	Samples difficult to locate; insufficient comparison space.	Create an indexed material library with a nearby review table and display surfaces.	Sample retrieval time, library use and user feedback.
5. Confidential client meeting	Open-plan conversations lack privacy.	Provide enclosed or acoustically protected meeting rooms with appropriate digital presentation facilities.	Room availability, acoustic privacy and booking patterns.
6. Hybrid design review	Remote participants cannot see drawings or contribute equally.	Use camera-aware layouts, microphones, shared displays and digital file access.	Audio/video quality, participation and meeting feedback.
7. Small studio with limited budget	Full renovation is financially unrealistic.	Prioritise low-cost zoning, furniture reconfiguration, acoustic improvements and technology upgrades.	Cost, implementation time and post-change feedback.
8. Low office attendance on some days	Some areas remain underused while resources are duplicated.	Consider multipurpose settings only where equipment, storage and changeover are practical.	Utilisation by time and day; setup and reset time.
9. Colour and finish evaluation	Artificial lighting or screen display distorts material judgement.	Provide a controlled material review location with suitable daylight and colour-consistent lighting.	User assessment and lighting conditions.
10. Staff with different accessibility needs	Uniform furniture and circulation exclude some users.	Apply inclusive design principles to routes, furniture, controls and meeting settings.	Accessibility audit and confidential user feedback.

11. PRACTICAL VALUE FOR USERS AND THE MARKET

The practical value of the proposed framework is that it translates broad workplace trends into decisions that can be understood by the people who commission, design, operate and use studio interiors. Its value is potential and should be evaluated through application rather than presented as a proven financial or productivity outcome.



11.1 Value for Studio Owners and Management

Better-informed investment: identify which spaces and facilities are genuinely needed before committing to renovation expenditure.

More deliberate space allocation: compare peak occupancy, task frequency and room utilisation before reducing or adding workstations.

Operational continuity: plan for equipment, storage and project resources that must remain accessible across hybrid schedules.

Reduced design risk: test layout options against circulation, privacy, accessibility and environmental criteria before implementation.

11.2 Value for Employees and Studio Users

Greater choice between focused work, collaborative activity and confidential discussion.

More suitable furniture and workstation arrangements for prolonged digital work.

Improved access to material samples, project resources and shared equipment.

More inclusive meeting and circulation environments when accessibility is considered from the beginning.

Clearer processes for shared desks, room booking, sample storage and equipment use.

11.3 Value for Interior Designers and Consultants

A structured briefing tool that links client activities to spatial requirements.

A defensible basis for zoning, furniture schedules, adjacency planning and technology specifications.

A way to compare design alternatives using user experience and operational criteria, not appearance alone.

An opportunity to provide post-occupancy evaluation as part of professional design services.

11.4 Value for the Furniture, Technology and Fit-Out Market

The framework may help suppliers and fit-out professionals understand demand for adaptable workstations, ergonomic seating, modular project tables, acoustic products, storage systems, meeting-room technology and durable workshop furniture. It encourages needs-based specification rather than indiscriminate product substitution. For manufacturers, this can support more relevant product development, repairability, modularity and lifecycle service offerings. These are potential market implications; the paper does not quantify market size or forecast sales.

11.5 Value for Sustainability and Resource Use

Where existing buildings can be adapted instead of comprehensively rebuilt, a careful space audit may help retain usable partitions, furniture and services. Reconfigurable furniture, durable finishes, repairable components and organised material libraries can reduce unnecessary replacement. Sustainability benefits should be assessed through actual material quantities, product lifespans, energy use and waste records rather than assumed from the label 'flexible'.

11.6 Stakeholder Benefit Matrix

Stakeholder	Potential benefit	How to assess it
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Studio owner	More informed renovation and space decisions.	Capital cost, utilisation, room conflicts and operational feedback.
Architect/interior designer	Clearer design brief and measurable criteria.	Brief completeness, design revisions and post-occupancy review.
Employees/interns	Improved task fit, comfort and access to resources.	User satisfaction, ergonomic review and reported barriers.
Clients	More effective presentations and collaborative reviews.	Meeting feedback and clarity of project communication.
Furniture/fit-out suppliers	Better understanding of task-specific demand.	Specification patterns, product performance and maintenance.
Building/facility managers	More coordinated occupancy and environmental management.	Service performance, maintenance and indoor-condition records.

12. DESIGN AND IMPLEMENTATION RECOMMENDATIONS

12.1 Begin with a Workplace Audit

Record the current layout, user groups, work activities, attendance patterns, equipment, storage, circulation and environmental conditions. Identify both formal spaces and informal workarounds, such as employees using meeting rooms for focused work because no quiet setting is available.

12.2 Plan by Activity and Adjacency

Locate activities that support one another close together while separating activities that create noise, dust, confidentiality or circulation conflicts. For example, a material review table should be convenient to the sample library; a model-making area should be near suitable storage and services; quiet computer work should be buffered from high-traffic collaborative areas.

12.3 Provide a Balanced Range of Settings

Consider a combination of assigned workstations, shared desks, project tables, quiet settings, small meeting rooms and informal collaboration areas. The mix should follow actual workflow and attendance rather than a fixed ratio.

12.4 Integrate Ergonomics and Inclusive Design

Specify adjustable seating and work surfaces where appropriate, provide suitable monitor and task-lighting arrangements, maintain accessible circulation and consider the needs of users with different physical requirements. Furniture selection should be evaluated through fit, durability, adjustability and maintenance.

12.5 Coordinate Environmental Systems

Review ventilation, daylight, glare, thermal comfort and acoustics together. Coordinate partitions and furniture with air distribution, lighting and circulation. Where specialist processes occur, assess their specific ventilation, storage and safety needs.

12.6 Design Hybrid-Ready Meeting Facilities

Plan for camera sightlines, microphone coverage, display visibility, power, connectivity and acoustic quality. Test the room from the perspective of remote participants as well as people physically present.

12.7 Use Phased and Budget-Sensitive Implementation

For smaller practices, prioritise changes with high functional value and manageable cost: reconfigure existing furniture, improve task lighting, create a quiet zone, reorganise storage, add basic meeting technology and address obvious circulation conflicts. More extensive renovation can follow when supported by evidence and budget.

12.8 Review After Occupancy

A design should be evaluated after people have used it. A post-occupancy review can identify whether rooms are available when needed, whether shared settings are accepted, whether acoustic conditions are adequate and whether physical resources remain accessible.

13. EVALUATION FRAMEWORK AND SUGGESTED INDICATORS

To make the proposed framework testable, the following indicators are suggested. They are not results from the present paper; they are measures that future case studies may collect.

Evaluation area	Suggested indicator	Possible collection method
Space utilisation	Occupied seats or rooms relative to available capacity at selected times.	Structured observation or booking records.
Workstation suitability	User-reported fit of chair, desk, screen and lighting.	Questionnaire and ergonomic checklist.
Privacy and concentration	Frequency of interruptions and perceived ability to focus.	Survey and short work-environment diary.
Collaboration	Ease of accessing project spaces and participation in reviews.	Interview and meeting observation.
Material-resource access	Time and effort required to locate and return samples.	Task observation and library audit.
Hybrid meeting quality	Audio, visual and participation problems.	Meeting checklist and participant feedback.
Environmental quality	Ventilation provision, thermal comfort, glare and acoustic complaints.	Building-services review and occupant survey.
Accessibility	Continuity and usability of routes, furniture and facilities.	Accessibility audit and user consultation.
Operational value	Maintenance, room conflicts, setup time and renovation cost.	Facility records and management interview.

If numerical scores are used, the study should explain the scale, sample size, missing responses and method of calculation. A satisfaction score should not be treated as a direct measure of productivity unless productivity is independently and appropriately measured.



14. LIMITATIONS AND FUTURE RESEARCH

14.1 Limitations

This paper is based on selected literature and conceptual synthesis; it does not report completed primary fieldwork.

The reviewed studies differ in country, building type, organisation, method and period, so their findings cannot be transferred without contextual judgement.

The proposed SASE framework has not yet been empirically validated.

Retrospective comparisons may be affected by incomplete historical plans, photographs or participant recall.

Potential benefits to users, organisations and the market are proposed implications, not quantified outcomes.

Local conditions in Bhopal and other Indian cities require direct investigation, particularly climate, building services, budgets and studio operating practices.

14.2 Future Research

Future work should apply the SASE framework to a clearly defined sample of architecture and interior design studios. A comparative case-study design could document existing layouts, collect user feedback, map activities and compare space use across different days. Where pre-pandemic evidence is available, historical and current plans can be compared. A longer-term post-occupancy evaluation could then test whether proposed changes improve task fit, comfort, access to resources and operational efficiency.

Further research could also compare small independent studios with larger multidisciplinary practices, examine differences between fully in-person and hybrid organisations, and evaluate the cost and lifecycle performance of adaptable furniture and renovation strategies.

15. CONCLUSION

The COVID-19 pandemic accelerated changes in how many organisations use their offices, but the lasting design challenge is not simply to accommodate remote work. It is to understand what the physical workplace should provide when employees attend for different reasons and undertake different types of work. For architecture and interior design studios, this question is particularly important because digital production exists alongside material exploration, physical model making, drawing reviews, client presentations and creative collaboration.

The literature reviewed in this paper indicates that flexible and activity-based workplace arrangements can support certain forms of interaction and mobility, but their outcomes are conditional. Privacy, autonomy, concentration, environmental quality and user experience cannot be assumed to improve automatically through open-plan or shared-desk strategies. The appropriate design response must be informed by the organisation's activities, users and operating conditions.

The paper's principal contribution is the proposed Studio Activity–Space–Experience framework, which connects professional activities with spatial responses, user experience and operational performance. It offers a structured way to consider situations such as peak attendance, intensive computer work, material selection, model making, confidential



meetings, hybrid reviews and budget-constrained renovation. It also provides a basis for future site observation, questionnaires, interviews and post-occupancy evaluation.

For studio owners, designers, employees and suppliers, the framework may support more transparent and needs-based decisions about space, furniture, technology and resources. Its value should ultimately be demonstrated through application and evaluation in real studios. The future of the design studio is therefore not defined by a single office typology, but by the quality of fit between people, activities, space and the resources that enable creative work.

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