

Flexible Classroom Interiors: A Study of Adaptable Learning Environments

¹Dr Sandeep Sachan

¹Associate Professor

¹National Institute of Fashion Technology, Varanasi

sandeep.sachan@nift.ac.in

Abstract—The research study defines classroom flexibility through interiors as an adaptability projection in the learning environments. Depicting on the current literature from 2022 to 2026, it identifies the impact on collaborative engagement, teaching benefits and wellbeing outcomes. Research insights reflect that while flexible designs justify learner involvement and efficiency over the pedagogy sequences, it focuses on learning environmental quality. This study outlines cost challenges, execution of inclusivity and suggests recommendations for more effective implementation practices.

Index Terms—Collaborative Engagement, Flexible Classroom, Interior, Learning Environment.

I. Introduction

classroom interiors motivate student learning, manage wellbeing and ensure efficient teaching practices. Conventional classrooms are commonly arranged with fixed rows of desks facing a teacher, indicating teacher-centric pedagogy with limited movement (Bocking, 2022). Conversely, flexible classroom interiors have been designed to be configured through technology responsiveness and differentiate learning activities such as independent study, project discussion and group learning practices. Recent researchers acknowledge that adaptability with the learning environment can support learner autonomy and engagement when accurately synchronised with pedagogy (Eppendi *et al.*, 2025).

The changes towards interior flexibility have been empowered by the COVID-19 pandemic, when schools recognise the priority of multi-purpose spaces that suggest blended learning, frequent reorganisation and distancing. On the other hand, evidence indicates that installing model furniture or open-plan layouts is not sufficient to improve learning interaction (Wang *et al.*, 2025). Additionally, in accurate acoustics, lack of teacher training and destruction can also decrease effectiveness.

1.1 Aim and Objectives

The primary aim of the research study is to analyse how flexible classroom interiors support adaptable learning opportunities. To accomplish this goal, the objectives are considered in this article is given below.

- To analyse recent literature on flexible classroom design
- To identify the benefits and limitations of adaptable interiors
- To explore links between space design, pedagogy and student outcomes
- To recommend future improvements for educational institutions

1.2 Research Questions

- How do flexible interiors influence teaching and learning?
- What interior features most effectively support adaptability?
- What barriers limit successful implementation?
- What recommendations can be suggested for improving classroom flexibility through design?

1.3 Problem Statement

Multiple schools and teaching organisations have invested in interior redesign without any evidence-supported planning. Therefore, some flexibility regarding the classroom has not accurately provided improvement of spatial changes for management, pedagogy and inclusion criteria.

II. Literature Review

2.1 Spatial Flexibility and Pedagogical Change

Literature aligns flexibility through interior and student-specific pedagogy. Flexibility for learning spaces has been intended to justify innovation, collaboration and creative thinking with teaching practices. In contrast, actual practice remained conventional as teachers reproduced old habits in new rooms (Gurung *et al.*, 2023). Therefore, it indicates that space alone is not sufficient to transform new learning changes. Similarly, research studies acknowledge that adaptability through classroom activities influences movement between learning zones, group work, and remembering discussions when teachers use multiple instructional processes.

2.2 Furniture Mobility and Learner Agency

Furniture is also a major component for managing flexibility in interior design. Mobile tables, standing desks, writable surfaces, modular storage and soft seating often support frequent reconfiguration (Lawson, 2024). Flexibility through furniture positioning improved student engagement, especially when learners could select seating according to their needs. Henceforth, some arguments pointed out that fashionable furniture became symbolic and aesthetic rather than functionally matched with the curriculum requirements (Al-Saud *et al.*, 2024).

2.3 Inclusion, Wellbeing and Physical Activity

Flexibility in terms of spaces supports inclusion, considering different ways of participation. Students who experience challenges with traditional desk layouts and prolonged sitting may respond to movement-friendly environments. A 2024 review states that flexible learning spaces have been regarded with sedentary behaviour reduction and priority over physical activities (Dinkelspiel Ekman *et al.*, 2025; Larose *et al.*, 2024). Yet inclusion is not an automated procedure. Therefore, open-plan rooms may overwhelm neurodiverse students or learners' sensitivity towards noise.

2.4 Environmental Quality

The quality of interior environments refers to accurate lighting, acoustics, air quality management and temperature control. Research analysis acknowledges that these factors are strongly relevant to comfort and concentration (Larose *et al.*, 2024). Therefore, collaborative classrooms can ensure higher noise levels if acoustic treatment is accurately planned.

2.5 Theoretical Underpinning

This topic can be analysed through *constructivist learning theory*, reflecting social, active and experiential learning distributions (Al Abri *et al.*, 2024). Flexible interiors support constructivism by ensuring necessary interaction, learner specification and their movement. It also synchronises with the *socio-spatial theory*, where space refers to the relationship between behaviours (El Azizi El Alaoui, 2026).

2.6 Literature Gaps

Apart from the practical valuation, there are some gaps remaining. Firstly, limited evidence linking interiors directly to the academic settings. Secondly, inappropriate interpretation from studies from improving countries and public-school perspectives. Third and foremost, less attention to the maintenance cost, life cycle sustainability and teacher workload has been observed.

III. Methods

The review has considered a qualitative secondary research design using online journals, articles, peer-reviewed and scholarly message reports between 2022 and 2026, which builds on the foundation of earlier studies for relevance. Sources have been identified through Google Scholar using keywords such as adaptable learning environment, flexible classroom interiors, creative learning spaces, and school furniture (Papaioannou *et al.*, 2023). Resource materials have been screened for credibility to ensure relevance. Research analysis has been coded and compared to examine findings, contradictions, and address research gaps.

Research timeline

Stage	Activity	Timeline
Phase 1	Search databases and Google Scholar	Week 1
Phase 2	Screen and select sources	Week 1
Phase 3	Data analysis	Week 2
Phase 4	Draft findings and discussion	Week 2
Phase 5	Final review and editing	Week 3

Table 1: Project timeline (Source: Self-developed)

IV. Findings

Increased Collaboration and Engagement

Flexibility in terms of classroom interiors has been connected with stronger student engagement and collaboration levels than conventional processes of learning (Yesil and Aras, 2024). These layouts decrease the passive priority of conventional teacher-faced settings and empower active learning behaviour. In the words of Sharma *et al.* (2024), multiple studies described that students in an adaptive environment spent more time interacting with their classroom activities and peer discussion. On the other hand, collaboration depends on efficient classroom engagement. Without clarity, group-supported layouts may prefer social distraction rather than productive management.

Learner Autonomy

Flexibility management regarding spaces has described learner autonomy by ensuring student selection, how, and where they work. As argued by Dixit *et al.* (2024), concerns regarding focused tasks, shared tables for teamwork and desk movement offer beneficial options that accurately identify multiple learning styles. This control sense can improve responsibility, motivation and a self-regulated perspective. Students become more and more concerned about their environmental selection that focuses on their needs (Kerimbayev *et al.*, 2023). Some specific learners may experience challenges with decision-making if behavioural structures are less effective. Thereby, selection must be balanced with instructional references.

Teacher Capability Dependence

Classroom design dependency does not change the learning perspective. Flexible rooms have been used in the same way as traditional classrooms, with desks rearranged while lecture-style teaching continues (Chan *et al.*, 2023). This refers to the teacher's capability as another critical success factor within this context. Educators need training in collaborative pedagogy, managerial movement and instruction to increase interior adaptability potential.

Noise and Distractions

Though dynamic and open layout support benefits, they may create distraction and noise. Distributed activity, conversation and increased movement can impact learner concentration, particularly those with attention difficulties or any sensitivities in the nervous system (Bilgiç *et al.*, 2025). Specific privacy can

discourage independent and reflective decisions. Therefore, it outlines the requirements of zoning practices or acoustic treatments.

V. Discussion

The findings signify that flexibility for classroom interiors can positively intensify learning environments, concerning the outcomes with conditioner rather than preferable. It shows a critical distinction, as some organisations just assume that redesigning spaces ensures innovation. In practice, the literature constantly refers to how pedagogy manages impact at large. For instance, collaborative engagement within the classroom flexibility dynamics supports student accessibility towards breakout zones, shared tables and movable seating arrangements (Al-Saud *et al.*, 2024). However, the environmental potential has not been used if teachers continue with one-sided instructions. The tension between classroom reality and policy rhetoric, whereas spaces signal innovation rather than conventional practices.

Therefore, furniture flexibility indicates valuation over the learner support and frequent transition between individual tasks. While subjective variation has not preferred behavioural guidance and creates disorder, younger individuals may consider a more structured priority than older students (Gurung *et al.*, 2023). As a result, adaptability should not refer to digital discipline negligence.

Inclusion is another major factor, while flexibility in interiors can support learner diversification through choices. They may not provide advantages to the students in terms of sensory sensitivity, anxiety in noise or attention difficulties throughout the rooms (Dinkelspiel Ekman *et al.*, 2005). This contradicts the idea that some designing narratives that signal openness are beneficial. Apart from that, inclusivity in terms of designing segment retreat areas, estimated layouts and acoustic distribution. Environmental quality is significant as manual baseline projects promote furniture visibility but do not consider thermal, lighting and acoustic comfort (Lawson, 2024). This neglects concentration apart from furniture improvement decisions. In this regard, successful flexibility regarding interior designing is holistic planning rather than aesthetic distribution.

VI. Conclusion and Recommendations

6.1 Overall summary

Flexibility for classroom interiors signified an important transformation from a static environment towards a learning and adaptability ecosystem. Current research indicates benefits involving stronger involvement, learner autonomy movement and collaborative orientation. On the other hand, positive benefits from such orientation are not automatic. Lack of acoustics, less availability of teacher training and furniture updates can limit the impact. Hence, classroom adaptability should be distributed as a socio-spatial recommendation for residential furniture trends.

6.2 Recommendations

- Teacher training is necessary to use spaces dynamically (Poyato-Nunez *et al.*, 2024).
- Design a quiet zone, multiple sitting options and sensory-adaptive areas.
- Improvement for lighting and ventilation with furniture investment (Tikul *et al.*, 2022).
- Pilot layout before large-scale spending.
- Analyse attainment, engagement and wellbeing.
- Improvise lower-cost alternatives for public schools.

6.3 Future Scope

Future studies elaborate on academic performance in terms of classroom flexibility models and sustainability impact in emerging economies. Comparative research across different cultural and age groups would acknowledge global adoption with evidence.

References

- [1] Al Abri, M.H., Al Aamri, A.Y. and Elhaj, A.M.A. (2024) 'Enhancing student learning experiences through integrated constructivist pedagogical models', *European Journal of Contemporary Education and E-Learning*, 2(1), pp.130-149. DOI: [https://doi.org/10.59324/ejceel.2024.2\(1\).11](https://doi.org/10.59324/ejceel.2024.2(1).11)
- [2] Al-Saud, K., AlAli, R., Al Saud, A.M., Abouelela, A.S., Shehab, R.T., Moneim, D.A.A. and Hamid, A.E.M. (2024) 'Exploring the aesthetic and functional aspects of recycled furniture in promoting sustainable development: an applied approach for interior design students', *Sustainability*, 16(10), p.4003. DOI: <https://doi.org/10.3390/su16104003>
- [3] Bilgiç, Z.E. and Kutlu Demir, Ö. (2025, October) 'Supporting English language learning for students with attention deficit hyperactivity disorder through total physical response and multiple intelligences theory', In *Frontiers in Education* (Vol. 10, p. 1661792). Frontiers Media SA. DOI: <https://doi.org/10.3389/educ.2025.1661792>
- [4] Bocking, P. (2022) 'Schools, austerity & privatization in the pandemic era', *Ontario Teachers' Federation*. Available at: <http://www.otffeo.on.ca/en/wp-content/uploads/sites/2/2022/05/Schools-Austerity-Privatization-in-the-Pandemic-Era-Paul-Bocking-FULL-VERSION.pdf>
- [5] Chan, D.W., Lam, E.W. and Adabre, M.A. (2023) 'Assessing the effect of pedagogical transition on classroom design for tertiary education: Perspectives of teachers and students', *Sustainability*, 15(12), p.9177. DOI: <https://doi.org/10.3390/su15129177>
- [6] Dinkelspiel Ekman, S., Nair, M., Gredin, N.V. and Lindgren, E.C. (2025) 'Reducing classroom sedentary behaviour: a scoping review of interventions and student involvement', *Health Promotion International*, 40(5), p.daaf167. DOI: <https://doi.org/10.1093/heapro/daaf167>
- [7] Dixit, A.C., Harshavardhan, B., Ashok, B.C., Sriraj, M.A. and Prakasha, K.N. (2024) 'Innovative pedagogical approaches for diverse learning styles and student-centric learning', *Journal of Engineering Education Transformations*, pp.178-188. Available at: <https://www.journaleet.in/index.php/jeet/article/view/2323>
- [8] El Azizi El Alaoui, A. (2026) 'Systemic Socio-Spatial Rhythms Theory A Relational-Temporal Approach in Contemporary Social Geography', Available at SSRN 6159067. DOI: <http://dx.doi.org/10.2139/ssrn.6159067>
- [9] Eppendi, J., anwar, A. and laksana, J.A.K. (2025) 'Fostering Learner Autonomy in EFL Classroom: The Impact of New Learning Guidelines and Relational Pedagogy', *Research and Innovation in Applied Linguistics*, 3(2), pp.215-236. DOI: <https://doi.org/10.31963/rial.v3i2.5523>
- [10] Formisano, M.A. (2024) 'Psychological dimensions of school space design', *ISAR Journal of Arts, Humanities and Social Sciences*, 2(11), pp.78-81. Available at: https://www.researchgate.net/profile/Maria-Anna-Formisano/publication/385907978_Psychological_Dimensions_of_School_Space_Design/links/673b6c5fa8173d223c0a6548/Psychological-Dimensions-of-School-Space-Design.pdf
- [11] Gurung, R.A., Chick, N.L. and Haynie, A. eds. (2023) *Exploring signature pedagogies: Approaches to teaching disciplinary habits of mind*. Taylor & Francis. Available at: <https://books.google.com/books?hl=en&lr=&id=CBLJEAQAQBAJ&oi=fnd&pg=PA1994&dq=actual+practice+remained+conventional+as+teachers+reproduced+old+habits+in+new+rooms.&ots=iyUo6dRkXj&sig=7y-jtVF2csKXo83SmWlnzmYDZ9Q>
- [12] Kerimbayev, N., Umirzakova, Z., Shadiev, R. and Jotsov, V. (2023) 'A student-centered approach using modern technologies in distance learning: a systematic review of the literature', *Smart Learning Environments*, 10(1), p.61. DOI: <https://doi.org/10.1186/s40561-023-00280-8>
- [13] Larose, D., Massie, C.L., St-Aubin, A., Boulay-Pelletier, V., Boulanger, E., Lavoie, M.D., Yessis, J., Tremblay, A. and Drapeau, V. (2024) 'Effects of flexible learning spaces, active breaks, and active lessons on sedentary behaviors, physical activity, learning, and musculoskeletal health in school-aged children: a scoping review', *Journal of Activity, Sedentary and Sleep Behaviors*, 3(1), p.30. DOI: <https://doi.org/10.1186/s44167-024-00068-2>

- [14] Lawson, S. (2024) *Furniture design: an introduction to development, materials and manufacturing*. Hachette UK. Available at: https://books.google.com/books?hl=en&lr=&id=iMbfEAAAQBAJ&oi=fnd&pg=PA1&dq=Mobile+tables,+standing+desks,+writable+surfaces,+modular+storage+and+soft+seating+often+support+frequent+reconfiguration.+&ots=CjODUkpKrJ&sig=u9_7gnG9mEUyLI126nj8nesSQeM
- [15] Papaioannou, G., Volakaki, M.G., Kokolakis, S. and Vouyioukas, D. (2023) 'Learning spaces in higher education: a state-of-the-art review', *Trends in Higher Education*, 2(3), pp.526-545. DOI: <https://doi.org/10.3390/higheredu2030032>
- [16] Poyato-Nunez, M.M., del Carmen Olmos-Gomez, M. and Parra-Gonzalez, M.E. (2024) 'The Educational Space and Its Impact on Pedagogical Dynamics: Teachers' Perception of Their Working Environment', *Journal of Education and e-Learning Research*, 11(4), pp.646-654. Available at: <https://eric.ed.gov/?id=EJ1457050>
- [17] Sharma, K., Nguyen, A. and Hong, Y. (2024) 'Self-regulation and shared regulation in collaborative learning in adaptive digital learning environments: A systematic review of empirical studies', *British Journal of Educational Technology*, 55(4), pp.1398-1436. DOI: <https://doi.org/10.1111/bjet.13459>
- [18] Tikul, N., Hokpunna, A. and Chawana, P. (2022) 'Improving indoor air quality in primary school buildings through optimized apertures and classroom furniture layouts', *Journal of Building Engineering*, 62, p.105324. DOI: <https://doi.org/10.1016/j.jobe.2022.105324>
- [19] Wang, L., Song, J., Guo, W., Wan, G., Caneparo, L. and Liu, X. (2025) 'Impact of Multiple Environmental Factors of Space Clusters for Informal Learning in Library Renovation and Update', *Buildings*, 15(24), p.4530. DOI: <https://doi.org/10.3390/buildings15244530>
- [20] Yesil, L.B. and Aras, İ.S. (2024) 'The significance of flexible learning spaces and student-centred pedagogies in school settings: A comparative case study', *International Education Journal: Comparative Perspectives*, 23(1), pp.1-24. Available at: <https://openjournals.library.sydney.edu.au/IEJ/article/view/15573>