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Use of learning space to promote active learning in health sciences programmes

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I. INTRODUCTION

Learning spaces can be physical, virtual, or hybrid spaces where students engage with the learning material and interact with peers and facilitators. Traditionally, learning spaces used to be classrooms, lecture halls, laboratories, and libraries and would include a teacher and students working inside a fixed space using a blackboard/whiteboard, PowerPoint projector, boards, and flexible/fixed seating arrangements. With the advancement in educational methodologies and incorporation of technology and newer applications, learning spaces now include simulated laboratories, online learning platforms, and virtual and augmented reality-based platforms. Using virtual spaces students can interact and learn from wherever they are living/staying.

The healthcare sector has a demand for personalised and precision medicine, teleconsultation, artificial intelligence (AI)-assisted devices and programs, health/clinical applications, health informatics, and robotics along with the need for healthcare and clinical services and medicines. However, there has not been enough research and discussion around the built-in environment i.e., learning spaces in health sciences education and the activities of teaching and learning (Temple, 2007). Against this backdrop, we need to examine how students use learning spaces to interact and engage with the learning material in our current environment and think about how we can optimise the learning spaces for active learning and make them more impactful and future-ready.

II. LEARNING SPACES

Learning spaces in health sciences must consider the unique needs of these subjects in terms of teaching and learning activities, student engagement, and hands-on sessions. Learning spaces design are domain specific and must cater to the teaching and learning needs of the discipline. Designing learning spaces for health sciences is challenging. Learning space can have a significant impact on teaching and learning experiences. A well-designed learning space can help students in many ways:

- It can promote student engagement, is always inviting and comfortable, and stimulating for students. They can sit together and discuss a case or work on a project (Wilson & Randall, 2012).
- A nice and comfortable multi-purpose space can help students engage in project work. They can move the seating to suit their group's needs, write on the table surface, and whiteboards and discuss, charge their laptops, and use the internet to interact in virtual spaces. Interactive classrooms could make instruction more efficient and effective. More research is needed on the effect of learning space design on students' engagement and the outcomes of teaching and learning. Health sciences students engage in formal and informal learning, peer support and discussion, clinical case practice and use different diagnostic equipment.
- A well-designed and well-equipped classroom can allow teachers to design workshops and activities that

engage students in groups. A flexible learning space can help teachers be more creative and innovative in their approach. Flexible learning spaces provide pedagogical opportunities and support innovative practices that are not easily provided by traditional learning spaces (Benade, 2019). Health Sciences schools must think of ways to design and use learning spaces to promote active learning and help students learn clinical decision-making, required skills, therapeutic reasoning, clinical examinations, and other important practical skills.

- A well-designed learning space can promote collaboration and enhance creativity among the students. A learning space where students can interact face to face, bring their devices, and use tables, boards, and other tools will promote better collaboration and learning. However, one significant challenge is to have enough collaborative learning rooms to accommodate students; multipurpose tables, boards, and other teaching aids and devices are important given that space is at a premium, especially in urban centres (Jamieson, 2003; Van Joolingen et al., 2005). Hybrid learning spaces may partly address this problem.

III. DESIGNING A COLLABORATIVE LEARNING SPACE

To design a collaborative learning space for health sciences we must examine how learning occurs. Active learning plays an important role. There is extensive use of technology in learning. We use interactive whiteboards, create personalised learning environments, wireless networks and the internet, interactive software such as PollEverywhere, Slido and MyDispense, games, applications, etc. to engage with learners in a physical, virtual, or hybrid environment. So, our first consideration is to have a learning space that is flexible, accommodative, supports technologies used for teaching and learning, and is sustainable. Some steps that we can include in our planning and design of learning space can be:

1) Define the learning objectives: The first key consideration while designing a learning space is to look at the programme learning objective. We need to evaluate what students want to achieve in terms of learning outcomes and what skills do they need to acquire for that programme/subject. For campuses running multiple programmes collaboration across the discipline is needed during the planning stage to look at learning spaces that can work for multiple disciplines. Health sciences students gain specialised skills for patient care, including clinical competence, interdisciplinary collaboration, ethics, cultural sensitivity, and patient communication.

2) Consider the size and layout: The learning space must have adequate room to fit all the pupils in the group, necessary furnishings, and equipment. Consider the programme's enrolment and the activities that the learners will take part in. The layout should encourage student collaboration and active learning.

3) Utilise technology: Technology plays a significant role in modern-day learning. Our subjects/programmes are managed via online platforms like Moodle, CANVAS, Blackboard, etc. Post-COVID Universities/Schools are running their programmes in a hybrid fashion. Integrating the latest technology, especially the information and communication technology (ICT) based applications and built-in system seems to be vital when we deliver our programmes through online platforms. Tests are run via online quizzes and electronic assessment platforms.

4) Flexibility in learning spaces: Flexibility is the key consideration when designing a learning space in modern classrooms. These learning spaces must be customisable to accommodate the various learning requirements of the students in a flexible learning environment.

5) Optimise lighting and acoustics: Lighting and acoustics are critical factors that can impact learning. It is important when we want to use a virtual environment for immersive learning or play a video to demonstrate 3D- anatomical illustrations. Ensure the learning space has adequate lighting, and acoustics are optimised to minimise noise levels and distractions.

6) Emphasise sustainability: When designing the learning space, sustainability should be a top priority. To lessen the environmental impact and foster a healthy learning environment, incorporate sustainable materials and designs.

7) Encourage collaboration: Active learning requires collaboration, which is a crucial component. Think about including group tables, breakout rooms, and collaborative learning spaces.

8) Customisation of learning spaces: Learning spaces (formal or informal) must be accommodative. For example, a learning space must fit multiple activities like workshops, lectures, problem-based learning, small group discussions, simulation activities, etc. Thus, having flexible elements like collapsible walls, movable desks and chairs, computers on wheels, and foldable furniture and equipment will be ideal from a customisation perspective.

IV. CHALLENGES IN DESIGNING LEARNING SPACES

Learning space design is challenging especially for health and medical sciences programmes because of the specialisation and the complexities of the curriculum and its requirements. It is even more challenging for resource limited settings where universities and schools are struggling to deliver high quality teaching and learning even in traditional environments. These challenges are manifold:

1) Health sciences curricula are content-rich but traditionally taught didactically. Designing learning spaces, crucial for activities like problem-based learning, clinical skill practice, and immersive anatomy learning, presents challenges due to their specialised requirements. Altering spaces to these needs is complex.

2) Keeping the learning spaces human centred is another challenge given the rapidly changing teaching and learning delivery methods brought about by information technology. The pedagogy must be the priority and technology must support it and make it more efficient.

3) Designing learning spaces involves multiple priorities. There are elements like curriculum/content requirement, disability access, collaborative learning, and use of technology. Creating a learning space balancing these elements is a challenge, especially for educational institutions in low resource settings.

4) Designing adaptable learning environments that embrace evolving technologies and teaching methods is complex. A versatile collaborative space, equipped with tables, chairs, digital tools, and virtual platforms, must serve diverse students and activities. This challenge is intensified in resource-limited settings, where maintaining physical and virtual elements, costly online resources, and internet quality pose additional hurdles.

V. CONCLUSION

Learning spaces need proper focus. Health science programs are undergoing major structural transformations. Thus, our learning space must be coordinated with active learning pedagogy and philosophy. While designing learning spaces we must

consider flexibility, comfort, technology, collaboration, and safety to build a collaborative and futuristic learning space that allows students to engage with their learning content and achieve the required learning outcomes.

Notes on Contributors

BKC contributed to the conceptualisation of the manuscript, wrote the first draft, revised the subsequent draft, and contributed to the final draft. PRS contributed to the conceptualisation of the manuscript and critically revised the first draft. He contributed to the subsequent revision and finalisation of the manuscript.

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Declaration of Interest

The authors would like to declare that they do not have any conflict of interest.

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