The Learning Space Model For Microteaching Course

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Abstract. This study aims to systematically review literature reviews regarding innovative and effective learning space models for microteaching courses in the 21st century. This model integrates technology, interactive learning tools, and pedagogical approaches that align with the times' demands. Using the right learning space model can increase the effectiveness of microteaching and provide a better learning experience. The method used is a systematic literature review to investigate and analyze research that has been done previously in this domain. Therefore, researchers collect, synthesize, and compile relevant research findings to comprehensively understand effective learning space models in supporting microteaching. It is hoped that this systematic review of the literature can provide a broader picture of learning space models that have been tested and proven to be effective in supporting microteaching. The results in this study illustrate that the development of a learning space model from various scientific influences creative, effective, innovative, and interactive learning processes.

Keywords: Learning Space Model, Microteaching Course

1 Introduction

Technological developments in the field of education have undergone significant changes in recent years. Likewise with the learning space. which is very dynamic from time to time and year to year. Since 1990 technology, such as multimedia, computers, digital projectors, and the internet has entered schools and classrooms [1]. Attention to the study space is the main focus considering that the 21st century learning space is an effective basis for innovation in improving the academic performance of students and enabling collaborative and independent learning on campus institutions [2]. The traditional concept of a study room has changed into a more flexible, interactive, and technology-based learning space [3]. Learning space is not tied to one place and time but can be done at home, community, online, or virtual, and can be arranged indoors and outdoors, anytime and anywhere [4].

Study room refers to two characteristics, namely formal and non-formal learning spaces. Formal learning is usually organized and structured and has learning objectives; Formal learning is usually delivered by trained teachers systematically and deliberately at schools or universities. Informal learning is a learning process that is carried out without having a goal that is assessed as a result of learning and is not intentional from the learner's point of view, such as independent learning or learning

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from experience [5]. The characteristics of the study room also have variable components such as size, shape, environmental settings, technology involved, activities, and users [6].

Problems arose when the Covid-19 pandemic hit the world, the learning process was carried out from various learning spaces that were considered effective, such as the concept of learning from home, online, hybrid, blended, and learning to be done anywhere and anytime. Therefore, to overcome these problems this research is very important to do considering that new technologies in designing effective learning spaces require careful pedagogical considerations to support learning that increases effectiveness and provides a better learning experience.

Therefore, the learning space refers to the physical setting for the learning environment, the place where the teaching and learning process takes place [7]. The learning process with various learning models requires all levels of education, lecturers, teachers, students, and students to adapt themselves to the learning process [8]. The use of technology in the learning space is a new educational concept that emphasizes learning situations and student learning experiences that are integrated with technology, not only providing tools and methods for exploring teaching/but also designing learning spaces that provide opportunities for students to experience an all-technology learning process [9]. Therefore, the way classrooms are specially organized and equipped is a key factor that can contribute to the success and quality of interactions in the educational process [10].

Learning spaces are designed to support traditional lecture halls or classrooms, facilitating, stimulating, or enhancing learning, and teaching [7]. A variety of learning spaces designed to be utilized by educational institutions to support various pedagogies in realizing calm, active learning, kinesthetic learning, vocational learning, experiential learning, and so on [6]. According to Vygotsky (1978), innovative learning spaces contribute to improving academic performance in theory and the principles of social constructivism. Therefore, learnveling space is a social process and is optimized when students build knowledge actiy together [11].

Maximizing learning is a top priority when designing or redesigning learning spaces. Therefore, in line with this, the learning space is well planned to support pedagogical practices that can activate, involve, and challenge students to succeed and change quickly to learn everywhere [1]. When the study room is well designed, it will affect the learning process. For this reason, it is important to design study spaces with various considerations in the learning process. The current design of high-quality learning spaces, such as interactive tutorials, virtual wireless, blackboards, and mobile devices have developed and changed people's lives in the field of education [12].

One of the learning space frameworks is called "Pedagogy-Space-Technology" (PST) (Fisher, 2005) which contains three elements of "pedagogy, space, and technology". In his explanation that pedagogy provides action guidelines for the combination of technology and learning space. The study room promotes pedagogy and embeds formation technology into it. Information technology strengthens the pedagogical effect and expands the scope of the learning space. Thus, pedagogy, learning space, and technology complement each other [12].

In addition to this, the renewal and development of learning space involves networks and becomes a new force to encourage educational development [13]. The in-depth development and application of networked learning space teaching modes is a new requirement for the education industry that is attached to wifi, the internet, and signals [1].

Several Guiding effective learning design in the learning space [5], such as linking all activities in learning spaces, sustainable, personalized, accessible, open, easy, and usable by everyone, Spaces must support collaboration, spaces must support learning engagement content, students and other teachers.

The main objective of this systematic review is to provide a deeper understanding of the relationship between study room design and student learning experiences in microteaching courses. So that the learning space becomes effective for promoting independent, flexible, and involved learning by providing the right technology and pedagogy for students in microteaching courses.

Based on the literature review, so far there has been no disclosure about the Learning Space Model research in the microteaching course. For this reason, researchers are trying to fill in the gaps in the literature review with the updated value of the learning space model in microteaching courses as an effective learning space in creating a more interactive, collaborative learning environment to involve as many students as possible and optimize learning activities to achieve technology-based learning competencies. A well-designed study space inspires creative, productive, and efficient learning.

2 Method

Systematic literature review method to investigate and analyze research that has been done previously in this domain. A systematic review of the literature review on classrooms aims to investigate existing research on classrooms and provide a deeper understanding of the relationship between classrooms and student learning experiences in microteaching courses. Therefore, through a systematic review of the author's literature will involve several steps, such as the identification of relevant literary sources, selection in collecting data from articles, the final assessment of the quality of the research involved, and analysis and synthesis of previous research findings. Latest the articles were accessed from 2019-2023. Articles studied related to learning space *for* microteaching courses. Therefore, this study organizes publications and delimits areas: literature review in journals, peer-reviewed journals, and conference proceedings. The procedure for collecting research data can be seen in the picture below [18].

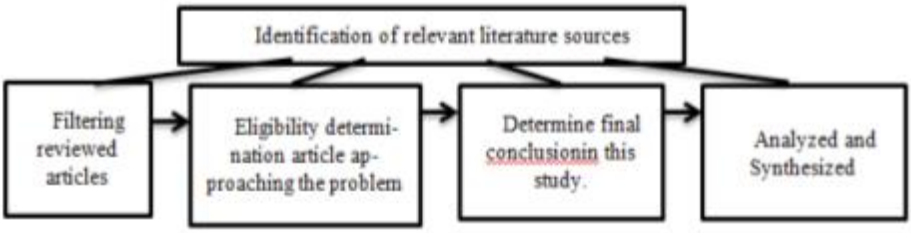

Fig. 1. Data Collection Procedure

Identification of relevant literature sources related to the problem under study based on the search method using publish or perish from Google Scholar found 861 articles with the keyword learning space and from Scopus 200 articles with the keyword learning Space . Meanwhile, if the keywords were combined into a learning space for microteaching courses and learning space for microteaching, neither Scopus nor Google Scholar could be found. Out of a total of 1061 articles obtained in the search and then selected in data collection for the final assessment of the quality of the research discussing study spaces, only 6 articles were netted that came close to discussing learning space. While discussing directly about the learning space model for microteaching was not found in his search. This shows that research within the scope of microteaching learning spaces can be a novelty to be researched. Based on 6 articles selected as relevant research have among others, is the design of learning spaces in networks (Spector & Yang, 2019), virtual reality (VR) technology learning space (Kong, 2019) , Virtual Reality Technology *Learning Space* (Gan et al., 2020), *'Pedagogy-Space-Technology'* framework learning space (Bi & Chen, 2022), Physical and Virtual Spaces in the *HyFlex learning environment* (Leijon, 2019), and *Hybrid learning spaces a three-fold evolving perspective* (Eyal & Gil, 2021). The six articles were analyzed and synthesis as an elaboration of the findings in this study.

3 Results and Discussion

Research that discusses learning spaces is still a trend in the digitalization era. The actual discussion about study rooms can be seen in the results of access through Google Trends which are in great demand. Based on a search on June 16, 2023, over the last two months, the frequency of enthusiasts on the topic of learning space *is* still at 90%. The learning space has an undeniable influence in shaping technical, pedagogical, psychological, social and effective practices in supporting learning in this era. Therefore, the design of study space is very important for students to participate in active learning [14].

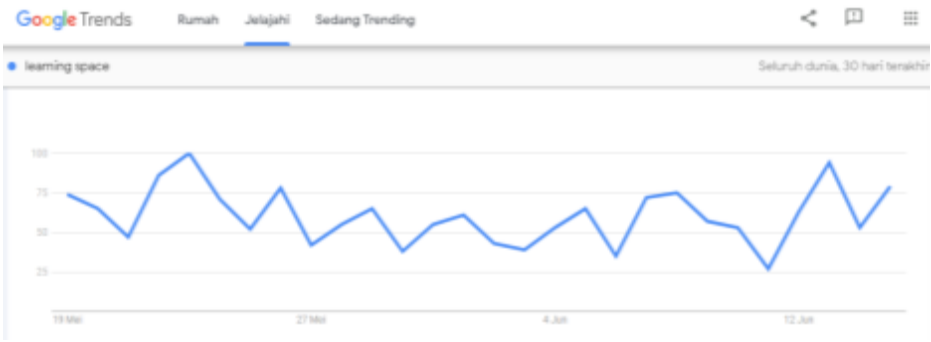

Fig. 2. Search Popularity for Learning Space, as reflected in *Google Trends* between May to June 2023 [17].

The study room model is a learning space model that refers to a place and surrounding environment that is related to where the teaching and learning process takes place, such as referring to various locations used for learning. Physical space refers to entities that can be involved in learning activities in the real world, such as classrooms, laboratories, studios, libraries, etc., while virtual space is a simulated space created by high technology such as computers. Students enter the virtual space through the network and other mobile terminal devices for learning and communication, such as simulation learning platforms, VR virtual laboratories, and so on, which are characterized by virtuality and simulation [5].

With the continuous development of internet technology, the concept of ubiquitous learning and networked learning spaces are receiving more and more attention. Therefore, college classrooms have switched to network teaching from traditional teaching. In this study, literature review and case studies are combined with ubiquitous learning and the construction of networked learning spaces to systematically discuss the classification and conceptual models of networked learning spaces from the perspective of ubiquitous learning. Based on the six articles discussing learning *space)* can be formulated as follows:

Table 1. Analysis and synthesis of research discussing learning space

No	Authors	Results
1	Spector & Yang (2019)	This research highlights the importance of networked learning spaces in the context of online learning. Researchers identified further that in networked learning requires an environment that supports collaboration, interaction, and accessibility. The results of the research show that an effective networked learning space features such as discussion forums, communication tools, and easy access to materials.
2	Kong (2019)	This study focuses on virtual reality (VR) tech-

		nology learning spaces. This study found that the use of VR in learning spaces can increase student engagement and interest in learning. The results of the study indicate that VR learning spaces can create immersive learning experiences and increase understanding of complex concepts.
3	Leijons (2019)	This research explores physical and virtual spaces in the HyFlex (hybrid-flexible) learning environment. This study shows that the combination of physical and virtual space can provide flexibility and choice to students in choosing learning methods that suit their preferences and needs. The results of the study show that the HyFlex room can increase participation, interaction, and collaboration between students and teachers.
4	Gen et al. (2020)	This study explores learning spaces using virtual reality (VR) technology in the context of STEM (Science, Technology, Engineering, and Mathematics) learning. The findings of his research show that VR learning spaces can facilitate exploration, interaction, and a better understanding of concepts in STEM learning. provide immersive and interactive learning experiences.
5	Eyal & Gil (2021)	This research adopts an evolutionary perspective regarding hybrid learning spaces. This study identifies three stages of the evolution of hybrid learning spaces, namely physical and virtual separation, physical and virtual integration, and virtual and fission convergence. The results of the study show that the evolution of hybrid learning spaces can provide a holistic learning experience.
6	Bi & Chen (2022)	This study proposes a "Pedagogy-Space_Technology" framework for designing effective learning spaces. his research results highlight the importance of balanced integration between pedagogical approaches, supportive space design, and appropriate use of technology. This framework underscores the need to consider learning contexts, student needs, and learning

in designing effective learning spaces.

Overall the above studies use a qualitative approach with different research methods such as case studies, exploratory research, descriptive research, and conceptual analysis. The qualitative approach used allows researchers to understand in depth the use of learning space and its impact in different learning contexts.

From the previous research above, several examples of study rooms were found which are described as follows;

3.1 Augmented Reality Learning Room

Collaborative virtual reality (VR) study room is a collaboration space to support cooperative student learning processes and group work study rooms provide. In addition, they can also carry out group discussions other students globally and the help of the network (Ng, 2015) . With high-quality teaching resources, VR Classroom integrates virtual reality into teaching and learning, which can create a near-real learning environment for students. VR Classroom is an open, interactive, and immersive learning environment with a companion editor to allow designers and teachers to create custom learning resources [5].

Fig. 3. layout of the VR learning space

Fig. 4. of the AR learning space

3.2 Collaboration Room at Texas State University

Collaboration Room at *Texas State University* (see Figure 4), Students can bring laptops and share screens. The virtual study room can be accessed collaboratively. Therefore. Introductory characteristics about collaboration spaces, like the room has a desk available with a large monitor and charging device. In figure 5 students can use mobile devices and notebooks to share screens [5].

Fig. 5. Collaboration Room at Texas State University

Fig. 6. student collaborative learning space

3.3 Study Room Beijing National Day School (BNDS)

Study room Beijing National Day School (BNDS), BNDS adheres to maker movement pedagogy on a large scale and comprehensively. In the learning process students carry out a design, develop, and promote various products related to various subjects [15]. An example of a study room arrangement at BNDS is presented as a personalized and collaborative virtual learning space, see Figures 4, 5, and 6. Multi-colored personalized virtual study room that stimulates students to learn. Comfortable furniture and soft lighting meet students' learning needs. Collaborative space is a space that is made flexibly to motivate students to share experiences together such as playing, demonstrations, debates, and so on. The shared study room becomes an extension of the pathway that connects other rooms and is a favorite area for study, meetings, and impromptu gatherings [16].

Fig. 7. Virtual study room at Beijing National Day School (BNDS)

Fig. 8. Virtual study room at Beijing National Day School (BNDS)

3.4 Network Learning space

Fig. 9. Conceptual model of network learning space based on ubiquitous learning (Kong (2019)

4 Conclusion

The development of science and technology in the field of education uses various models of learning spaces that can be used in an active and innovative learning process. Study room design to be flexible. Learning space can be combined between virtual and reality as well as between physical and virtual. Various models of learning space enrich the way of presenting information and visualizing abstract knowledge, concluding and reconstructing historical events, enhancing students' personal experiences, and expanding existing teaching models. The integration of technology and education is conducive to the transformation of traditional learning spaces into experiential learning spaces with a combination of virtual and reality. This can deepen the concept of deep learning, reconstruct the structure between teachers and students, encourage students to take the initiative to explore experiential learning, and increase motivation and learning outcomes. The combination of traditional classrooms and new learning spaces will facilitate educational development well. Therefore, there is clear evidence that various learning space models have been tested and proven to be effective in supporting learning. For the microteaching course, the study room model studied through research has not yet been found. However, these findings can be used as a basis for developing a model of a learning space innovative, collaborative, active, networked, and interactive in future microteaching learning.

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