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ORIGINAL ARTICLE

The Identification of Technological Infrastructures in the Physical Space of the Hidden Curriculum in Iranian Schools

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ABSTRACT

The purpose of this study was to identify the technological infrastructures within the physical space of the hidden curriculum in Iranian schools. The research method employed a qualitative and descriptive approach, was applied purposefully, and was based on a secondary study using a systematic review. The research population included all relevant articles published in domestic journals found in Persian-language academic databases such as SID, Magiran, Noormags, and Ensani database, which covered the period from 2005 to 2025, the year of writing the article. The research sample included 28 articles selected based on five inclusion criteria. The data collection tool was a researcher-made evaluation form, whose face and content validity were confirmed by education experts. To ensure the reliability of the findings, Scott's test was used, yielding an 80% agreement rate between coders. The findings were categorized into three areas: classroom space, general schoolyard space, and other locations. Most elements were studied in the classroom, and among all elements, wall slogans in schools were the most frequently mentioned. Increasing the use of technology in the physical environment of schools can enhance learners' interaction with the physical structure, promote agility, contribute to cost-efficiency, and help convey subtle positive messages.

KEYWORDS

Hidden Curriculum, Physical Space, Technology, Systematic Review, Schools.

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Introduction

Technological advancements have transformed the teaching and learning process, moving education beyond the mere transmission of information. In this context, providing high-quality learning environments tailored to the needs of learners has become a prerequisite for enhancing educational quality. Research indicates that the learning environment can influence users' perceptions of pedagogical methods, and that changes in classroom design and technology integration can affect students' behavior and interaction with educational content. From this perspective, the physical learning environment is not merely a backdrop for instruction but can itself function as a tool in the learning process (Amani et al., 2024; Casanova et al., 2020).

The physical space of a school also plays a role in shaping students' educational and formative experiences. Thoughtful design of this space can convey order, habits, implicit values, behavioral patterns, and rules to students, thereby connecting with the hidden curriculum (Tor & Demir, 2023). The careful preparation of the learning environment — including classroom and playground design, technology use, and the alignment of educational content with students' development—is a critical factor in the educational process. However, educational quality is not solely dependent on the physical space, as numerous other factors influence teaching, learning, and academic achievement (Falk, 2018).

Despite the importance of the physical environment in shaping students' experiences, studies on the hidden curriculum have seldom focused specifically on this component. Therefore, identifying the physical components of the hidden curriculum and examining the potential of technology within this space is of significant importance. This study aims to identify technological platforms within the physical space of the hidden curriculum in Iranian schools, seeking to uncover existing capacities for technology use in various school environments and to offer practical recommendations for planners and officials in the education system.

Method

This study is qualitative in nature, applied in purpose, and employs a secondary research method with a systematic review approach. The research population comprised articles published in domestic journals on the topic between 2005 and 2025. In the initial stage, 159 articles were identified from four Persian-language databases: the Scientific Information Database of SID, Magiran, Noormags, and Ensani. After removing duplicates, 96 articles remained. Screening for relevance to the hidden curriculum in education yielded 63 articles. Finally, after applying the inclusion criteria, 28 articles were selected for analysis. The inclusion criteria were: being a scientific-research article published in a domestic journal within the specified timeframe; having a study population of students, teachers, or school personnel; including the phrase hidden curriculum in the title or keywords; addressing the physical space, structure, or environment in relation to the hidden curriculum; and having the full text available. After selecting the sources, an evaluation form was developed with components such as research objective, framework and methodology, physical space components, journal, institutional affiliation, publication year, and data collection tools. The face and content validity of this form was confirmed by five experts. To assess the reliability of the coding process, Scott's pi test was used, and an inter-coder agreement coefficient of 80% was achieved.

Results

The review of studies revealed that the terms physical space, physical structure, and physical environment of schools were generally used to refer to a single concept and were considered a component of the hidden curriculum. The analysis showed that this space can be categorized into three main areas: the classroom, the schoolyard, and other school facilities.

Among the elements of the physical space, slogans and images on school walls received the most attention. These elements were used not only for aesthetic purposes but also to convey educational, religious, and instructional messages.

In the classroom, factors such as lighting, wall decorations, color schemes, desk and chair arrangements, equipment, and other environmental features were noted. Among these, adequate classroom lighting was the most frequently mentioned. The findings indicated that the quality of light, decorations, color, and layout can impact students' experience of the educational environment. It was also found that technology can enhance the adaptability and flexibility of the classroom environment. Identified technological platforms included smart lighting and ventilation systems, smart boards and interactive whiteboards, video projectors, laptops, tablets, light pens, and adjustable desks and chairs. The use of smart systems to control lighting, temperature, and ventilation can also contribute to better energy management in schools.

In the public spaces and schoolyard, wall slogans and images, bulletin boards, and banners were also frequently cited elements. The review indicated that traditional communication tools could be replaced or supplemented by technologies such as digital tickers, display screens, projectors, and school news channels and groups. These tools not only offer visual appeal but also provide greater flexibility in delivering educational, formative, and disciplinary messages, and can reduce reliance on paper and disposable banners. In other school areas, including the library, corridors, computer lab, workshop, and auditorium, various opportunities for technology integration were identified. These included digital libraries, smart sensors and cameras in hallways, digital displays, interactive kiosks, and smart attendance systems. The findings also showed that space shortages and rising student populations in some schools have led to ancillary spaces like libraries, workshops, and laboratories being converted into classrooms, thereby eliminating some of the educational and formative potential of these spaces. Technology can mitigate some of these limitations by creating digital and multi-purpose spaces.

Discussion and conclusion

The research results indicate that the physical space of the school remains a significant element in the formation of the hidden curriculum, and the school environment can play a role in transmitting values, attitudes, norms, and behavioral patterns to students. Although numerous studies have been conducted on the hidden curriculum, specific research on the physical component is limited. Among the identified elements, slogans and images on school walls received the most attention and can be effective in shaping students' habits, values, and behavioral patterns. Therefore, the design of these elements should be appropriate for the educational level, gender, ethnic context, and characteristics of the audience, and the inappropriate repetition of messages, which can lead to disenchantment, should be avoided (Sobhani-Nejad et al., 2013; Alamolhoda et al., 2017).

Technology can enhance the capacity of the physical space to convey messages of the hidden curriculum. The use of digital tools, interactive environments, and smart systems not only makes the environment more engaging but also allows for flexibility and rapid updating of content and environmental messages. In the classroom, technology can also improve educational conditions by increasing student interaction with the environment, creating flexibility in the learning space, and enabling the smart management of some physical elements. This finding is consistent with the emphasis of previous research on the need to update learning environments in line with technological growth (Mahmoudi & Ghoreishi, 2022; Hao & Florez-Perez, 2021). However, technological development should not lead to the elimination of the role of physical space or the creation of environments that disrupt the concentration and tranquility of students and teachers. While embracing technology, the

educational space must maintain its simplicity, calm, and formative function. Implementing these changes also requires funding and support from the education system. The main limitations of this research were the scarcity of direct research evidence on the topic and the lack of access to the full text of some studies. Accordingly, it is recommended to conduct in-service training courses for principals and teachers on the hidden curriculum and to develop practical guidelines for schools to make positive and purposeful use of its potential.

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Authors' Contribution

The sole author was responsible for the study's conceptualization, methodology, data collection, analysis, writing, and final approval of the manuscript.

Conflict of Interest

This article has no conflict of interest. This article has not been previously published in any domestic or foreign journal.

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