



## Review Article

# Classroom versus screen: An analysis of learning environments and experiences in the digital age

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### ABSTRACT

In the rapidly evolving landscape of medical education, the shift from traditional classrooms to digital screens has gained significant attention, particularly accelerated by the COVID-19 pandemic. This review examines the comparative effectiveness and perceptions of traditional versus digital learning environments in medical education. The findings highlight the benefits of digital learning, including cost savings and accessibility, while recognizing the value of face-to-face interactions for social and communication skills development. Meta-analyses and systematic reviews indicate a positive impact of flipped classrooms on student learning outcomes, underscoring the importance of pre-class preparation and interactive sessions. Additionally, digital tools such as virtual reality enhance the understanding of complex concepts, though challenges like digital inequality persist. By integrating early clinical experiences and active learning strategies, a balanced educational approach can be achieved, leveraging the strengths of both traditional and digital methods to improve student engagement and learning outcomes.

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## 1. Introduction

In the 21st century, medical education has witnessed a profound transformation driven by technological advancements and shifting pedagogical paradigms. The traditional classroom, once the cornerstone of medical training, is now being complemented and, in some cases, supplanted by digital learning environments. This shift has been significantly accelerated by the COVID-19 pandemic, which necessitated rapid adoption of online teaching methods across educational institutions globally. The resultant debate between the efficacy and preference for traditional classroom learning versus digital learning has become a focal point within the medical community.

Traditional classroom settings offer unique advantages, particularly in the development of social and communication skills through face-to-face interactions.

These environments foster direct mentorship and collaborative learning, essential components of medical training. However, the rise of digital learning presents compelling benefits, including cost savings, flexibility, and the ability to access educational resources anytime and anywhere. As digital technologies integrate into medical curricula, understanding their impact on student learning outcomes and perceptions becomes increasingly crucial.

This review aims to explore the evolving landscape of medical education by comparing traditional and digital learning environments.

## 2. Classroom Versus Digital Age

In the rapidly evolving landscape of medical education, the shift from traditional classrooms to digital screens has become increasingly prominent. In the digital age, the debate between traditional classroom learning and digital learning environments in medical community has gained significant attention.

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The shift towards digital learning has been accelerated by factors such as the COVID-19 pandemic, which forced educational institutions to adopt online teaching methods.<sup>1</sup> While some learners express a preference for face-to-face interactions due to the social and communication skills acquired in a classroom setting,<sup>2</sup> others highlight the benefits of digital learning, such as cost savings and the ability to access learning materials anytime and anywhere.<sup>3</sup>

The impact of technology on classroom environments is evident, with studies showing that technologies like digital devices and screens play a vital role in shaping students' perceptions of the physical learning environment. Researchers conducted a meta-analysis comparing the effectiveness of flipped classrooms versus traditional classrooms in health professions education and found a significant positive effect in favor of flipped classrooms, indicating that this innovative approach can enhance student learning outcomes.<sup>4</sup> Similarly, a systematic review focusing on the effectiveness of flipped classrooms in medical education and highlighted the shift in educational environments towards more interactive and engaging methods, emphasizing the benefits of pre-class preparation activities and small group classroom interactions.<sup>5</sup>

Moreover, few researchers explored student perceptions of the flipped classroom model in medical education and they found that students appreciated the pre-class preparation activities and engaging classroom sessions facilitated by online tools.<sup>6</sup> This suggests that digital tools can enhance student engagement and learning experiences in medical education.

On the other hand, Peters et al emphasized the importance of bridging the gap between classroom-based learning and clinical practice in medical education. They highlighted the value of integrating early clinical experiences into the curriculum to provide students with a more holistic learning experience.<sup>7</sup>

The use of digital tools, such as virtual reality, has been shown to improve students' understanding of complex concepts by providing visual representations and interactive experiences.<sup>8,9</sup> Digital literacy has become increasingly important in the modern educational landscape, with digital media offering new instructional approaches that prioritize learner-centered teaching methods.<sup>10</sup> However, challenges such as digital inequality and the need for appropriate learning spaces still persist, impacting students' socio-emotional perceptions and learning experiences.<sup>11</sup>

Efforts to bridge the urban-rural gap in access to digital learning resources are crucial to ensuring equitable educational opportunities for all students.<sup>12</sup> The effectiveness of different instructional practices and classroom environments on student learning outcomes is influenced by factors such as student motivation, attitudes towards learning, and responses to specific teaching methods.<sup>13</sup> The use of active learning strategies,

such as flipped classrooms and digital storytelling, has been shown to enhance student engagement, satisfaction, and understanding of course content.<sup>14</sup> Moreover, the transformation of traditional classroom spaces into active learning environments has been linked to improved student satisfaction and learning outcomes.<sup>15,16</sup>

### 3. Conclusion

The digital age has revolutionized the way education is delivered, offering new opportunities for interactive and engaging learning experiences. While traditional classroom settings continue to hold value for many learners, digital learning environments present unique advantages in terms of accessibility, flexibility, and cost-effectiveness. By understanding the impact of different learning environments and instructional practices on student outcomes, educators can create a balanced approach that leverages the benefits of both classroom and digital learning experiences.

### 4. Sources of Funding

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### 5. Conflict of Interest

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