

Submitted: 27 June 2024  
Accepted: 14 October 2024  
Published online: 1 April, TAPS 2025, 10(2), 94-96  
<https://doi.org/10.29060/TAPS.2025-10-2/II3451>

# Integrating digital tools and extended class hours in medical education

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## I. INTRODUCTION

In response to the evolving landscape of medical education, this personal view article explores the integration of advanced digital tools into the curriculum for medical students. As the field of medicine continues to advance rapidly, leveraging technologies such as Google Lens, WhatsApp, Microsoft Word (MS Word), Coggle mapping software, and artificial intelligence (AI)-driven assistants like Chat Generative Pre-Trained Transformer (ChatGPT) can significantly enhance the learning experience. This article outlines strategies for creating impactful PowerPoint presentations, developing comprehensive concept maps, and extending class hours to foster active engagement and a deeper understanding of medical concepts. The integration of these digital tools is increasingly recognised as essential in contemporary medical education. Digital tools can offer interactive and personalised learning experiences, providing medical students with innovative ways to grasp complex concepts and apply them in clinical scenarios. For instance, Google Lens can facilitate quick access to medical references and visual aids, while WhatsApp can enable real-time communication and collaboration among students and educators. MS Word is a versatile tool for drafting and organising written content, and Coggle mapping software can assist in visualising and connecting intricate medical concepts. Meanwhile, AI-driven assistants like ChatGPT offer opportunities for interactive learning and immediate support. Contemporary medical education must continuously evolve to effectively harness these technological advancements. Extending class hours and incorporating digital tools can provide students with more opportunities for engagement and learning, thus

enhancing their preparedness for modern healthcare challenges. As medical education adapts to incorporate personalised learning and evidence-based practices, it is crucial to integrate these digital tools to navigate complex clinical scenarios effectively (Park et al., 2021). The subsequent sections of this manuscript will delve into the specific ways in which these digital tools can be utilised to improve medical education, ensuring a consistent and impactful learning experience for students.

## II. INTEGRATION OF AI TOOLS IN MEDICAL EDUCATION

AI tools like Google Lens and ChatGPT are transforming how students retrieve, process, and present information in medical education. Google Lens allows students to extract information from textbooks and clinical images, aiding in the understanding of disease pathogenesis. For instance, it can scan textbooks to pull relevant content for study notes or presentations. PowerPoint is effective for delivering concise information (Seth et al., 2010), and its impact can be further enhanced by using AI tools to automate content extraction." The author's recommendation of using bold 40-point Calibri font for single-sentence slides is suggested to further improve student engagement and focus during lectures. In addition to ChatGPT, tools like Quizlet and Cortana support personalised learning. Quizlet helps create tailored flashcards based on individual learning needs, while Cortana can assist in scheduling study sessions. IBM Watson for Health further revolutionises education by aiding in the interpretation of clinical data, providing real-time analysis and treatment recommendations. AI-driven tools, such as chatbots and intelligent tutoring

systems (ITS), play a crucial role in modernising medical education. Chatbots offer instant support, while ITS create customised learning paths, enhancing outcomes through adaptive learning experiences. Gamification and virtual reality (VR) further boost student engagement by making learning interactive and immersive, allowing for realistic practice in clinical scenarios (Narayanan et al., 2023).

### III. ENHANCING MEDICAL EDUCATION THROUGH DIGITAL COMMUNICATION AND WORD PROCESSING TOOLS

Additionally, WhatsApp groups can promote Digital communication platforms like WhatsApp and word processing tools like MS Word have become integral to modern medical education, significantly enhancing content distribution and student engagement.

#### A. WhatsApp in Medical Education

WhatsApp facilitates structured communication within medical education. For instance, medical schools can create dedicated groups for subjects or cohorts, enabling the exchange of vital information. Faculty can share updates on guidelines, fostering discussions about implications and applications. WhatsApp's voice messaging and video call capabilities allow for immediate feedback and consultations, enhancing student support awareness of current medical issues. During disease outbreaks, for example, specialised groups can disseminate updates and discuss clinical strategies. Educational challenges, such as a "case of the week," encourage peer interaction and collaborative analysis, reinforcing learning.

#### B. MS Word in Medical Education

MS Word is widely used for organised note-taking, which aids students in systematically recording lecture content. For instance, during pharmacology lectures, students can create structured notes with headings for different topics and use bullet points for key concepts. The software also allows for annotating texts and research documents, enabling students to clarify and deepen their understanding.

Furthermore, MS Word supports detailed exploration of medical concepts through documentation and conceptual mapping. Students can create outlines or concept maps, integrating diagrams and linking to additional resources. Custom templates for clinical reports ensure consistency and enhance the overall learning experience.

### IV. CONCEPT MAPPING

Concept mapping is a powerful tool for visualising relationships between medical topics, facilitating deeper understanding and retention (Baliga et al., 2021). Coggle software is an example of a tool that helps illustrate the connections between risk factors and disease outcomes.

#### A. Expanding on AI-driven Tools for Concept Mapping

While Coggle is useful, several AI-driven tools offer enhanced features for concept mapping. ChatGPT can generate textual descriptions for relationships, which can then be visualised using software like Coggle. Other platforms, such as MindMeister, Lucidchart, and Xmind, provide advanced functionalities for creating dynamic and interactive concept maps, including collaborative features and automated suggestions.

Detailed examples of concept maps can demonstrate their application in medical education. For instance, a map showing the relationship between lifestyle factors and chronic diseases can visually represent how different elements influence disease progression. Incorporating concept maps at the end of sessions can reinforce key points, aiding retention and comprehension.

### V. EXTENDED CLASS HOURS FOR ACTIVE ENGAGEMENT

Extending class hours offers opportunities for immersive learning experiences and practical application of medical knowledge. By increasing lecture durations, students can engage more deeply with content through interactive methods such as case-based discussions and clinical simulations. For example, additional time may be allocated for simulating patient consultations, enhancing both practical skills and theoretical knowledge. Research supports the benefits of extended instruction time, particularly when coupled with a high-quality learning environment, fostering individualised learning essential for mastering complex medical concepts (Rivkin & Schiman, 2015).

### VI. IMPLEMENTATION CONSIDERATIONS

Successful integration of digital tools and extended class hours requires meticulous planning and consideration. Ensuring equitable access to digital tools among students and faculty, providing technology through university-provided devices, and offering professional development to enhance faculty digital literacy and instructional effectiveness are crucial. Implementing effective assessment methods to evaluate learning outcomes and measure the impact of digital tools on educational efficacy, such as online quizzes using AI-generated questions simulating clinical decision-making scenarios, is essential.

## VII. FUTURE DIRECTIONS & CONCLUSION

Summarising the transformative potential of integrating digital tools and extended class hours in medical education, this section highlights the benefits for medical students in terms of enhanced learning, preparation for modern healthcare challenges, and future career readiness. Equipping medical graduates with skills in digital tool utilisation prepares them for evidence-based practice and lifelong learning in clinical settings. Recommendations for future research focus on advancing AI technologies, conducting longitudinal studies on educational outcomes, and expanding digital integration across medical disciplines. Proposing avenues for further research and development in digital-enhanced medical education, this section explores advancements in AI tools to personalise learning experiences and improve adaptive educational technologies. It discusses potential applications of AI-driven learning modules across medical specialties to enhance interdisciplinary collaboration in patient care and research. Curriculum development should continually evolve to integrate digital tools and extend class hours, framed by ongoing research into their efficacy and impact on medical education.

### Notes on Contributors

Sulthan Al Rashid contributed to the concept, scientific content, data collection, and manuscript preparation.

### Acknowledgement

ChatGPT has been employed for manuscript preparation, encompassing tasks such as preparing, drafting, or editing text, without receiving authorship credit.

### Ethical Approval

No ethical approval was required for this study as no data were collected.

### Funding

The author did not receive any financial support for this study.

### Declaration of Interest

The author asserts that he has no conflict of interest.

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