

A Comparative Study of Power Point and Chalk Board Teaching Among Medical Students.

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Abstract

Teaching methodology plays a crucial role in effective medical education, particularly in subjects requiring conceptual understanding, visualization, and long-term retention. Traditional chalkboard teaching has historically remained the cornerstone of classroom instruction, whereas technological advancements have introduced multimedia-based teaching modalities such as PowerPoint presentations. Each method possesses unique advantages and limitations that influence student comprehension, engagement, interaction, and academic performance. The present review evaluates and compares PowerPoint-assisted teaching and traditional chalkboard teaching among medical students with respect to learning outcomes, student preferences, conceptual understanding, attentiveness, note-taking ability, classroom interaction, and overall educational effectiveness. Several studies indicate that PowerPoint teaching enhances visualization, organization of content, and time efficiency, whereas chalkboard teaching promotes better interaction, active participation, and gradual concept development.^{1,2} A combination of both methods appears to produce optimal teaching-learning outcomes in medical education.³ The article highlights the pedagogical significance of blended teaching approaches in competency-based medical education and emphasizes the need for adaptive teaching strategies that accommodate diverse learning preferences among medical students.

Keywords: PowerPoint teaching, Chalkboard teaching, Medical education, Teaching-learning methods, Competency-based medical education, Lecture methods, Multimedia learning, Anatomy teaching, Student perception, Educational technology

1. Introduction

Medical education is continuously evolving in response to technological advancements, changing educational philosophies, and increasing demands for competency-based learning. Effective teaching methodology is essential for facilitating conceptual understanding, critical thinking, clinical correlation, and long-term retention among medical students.⁴ Traditionally, chalkboard teaching has been the most widely

practiced instructional method in medical colleges due to its simplicity, flexibility, and interactive nature. However, the advent of audiovisual technologies and multimedia systems has led to the widespread adoption of PowerPoint presentations as a modern teaching tool.⁵

PowerPoint presentations enable integration of text, diagrams, clinical photographs, animations, videos, and flowcharts, thereby enhancing visual learning and content organization. In medical sciences, where understanding of complex anatomical, physiological, and pathological concepts is essential, multimedia-assisted teaching may significantly improve conceptual clarity and student engagement.⁶ Conversely, chalkboard teaching facilitates gradual development of concepts, spontaneous explanation, real-time interaction, and active note-taking, which may enhance student concentration and understanding.⁷

The debate regarding superiority of PowerPoint versus chalkboard teaching has gained considerable importance in medical education. While some educators favor PowerPoint for its efficiency and visual appeal, others advocate chalkboard teaching for its interactive and student-centered approach. Several studies suggest that excessive dependence on slides may reduce teacher-student interaction and passive learning may result when presentations are overloaded with information.⁸

In competency-based medical education (CBME), teaching methods should promote not only knowledge acquisition but also analytical thinking, communication skills, participation, and professional development. Therefore, identifying the most effective instructional strategies is essential for improving educational outcomes in medical institutions.

The present article reviews and compares PowerPoint-assisted teaching and chalkboard teaching among medical students with respect to educational effectiveness, student perception, advantages, disadvantages, and implications for modern medical education.

Traditional Chalkboard Teaching

Chalkboard teaching has remained one of the oldest and most trusted teaching methods in medical education. In this method, teachers gradually explain concepts while simultaneously writing or drawing diagrams on the board. This process allows students to follow the pace of teaching and actively participate in classroom discussions.⁹

Advantages of Chalkboard Teaching

- Encourages teacher-student interaction
- Facilitates gradual explanation of concepts
- Improves note-taking habits
- Enhances concentration and attentiveness
- Allows spontaneous illustrations and modifications
- Promotes active learning and classroom participation

Chalkboard teaching is particularly effective in anatomy, physiology, and biochemistry because diagrams can be developed step-by-step, helping students understand structural and functional relationships more effectively.¹⁰

Limitations of Chalkboard Teaching

Despite its advantages, chalkboard teaching also has certain limitations:

- Time-consuming method
- Difficult to display complex images and animations
- Limited visibility in large classrooms
- Requires extensive writing effort
- Less suitable for audiovisual demonstrations

PowerPoint Teaching in Medical Education

PowerPoint-assisted teaching has become increasingly popular in medical colleges due to rapid technological advancement and availability of multimedia infrastructure. PowerPoint presentations allow integration of high-quality images, videos, radiological scans, animations, graphs, and clinical photographs into lectures.¹¹

Advantages of PowerPoint Teaching

- Better visual presentation of complex topics
- Time-efficient delivery of content
- Improved organization and sequencing of lectures
- Facilitates incorporation of clinical images and videos
- Useful for large-group teaching
- Enhances audiovisual learning experience

PowerPoint presentations are particularly useful in subjects requiring visualization of microscopic structures, surgical procedures, radiological imaging, and embryological development.¹²

Limitations of PowerPoint Teaching

Several limitations of PowerPoint-based teaching have also been reported:

- Reduced interaction between teacher and students
- Passive learning environment
- Overcrowding of slides with information

- Decreased note-taking activity
- Technical failures and equipment dependence
- Rapid pace of lecture delivery reducing comprehension

Excessive reliance on slides may lead to reduced student concentration and limited classroom participation.¹³

Student Perception Regarding Teaching Methods

Several comparative studies among medical students have evaluated preferences regarding chalkboard and PowerPoint teaching methods. Many students report that chalkboard teaching facilitates better understanding because concepts are explained gradually and students can simultaneously prepare notes.^{7,9}

Conversely, students often prefer PowerPoint presentations for subjects involving diagrams, clinical photographs, animations, and visual demonstrations.¹¹ Some studies indicate that students perceive PowerPoint lectures as more attractive and organized, whereas chalkboard teaching is considered more interactive and engaging.¹⁴

A growing body of evidence suggests that students benefit most from a blended teaching approach integrating both PowerPoint and chalkboard methods.³ This hybrid strategy combines the visual advantages of multimedia presentations with the interactive and explanatory strengths of chalkboard teaching.

Impact on Academic Performance

Teaching methodology significantly influences student learning outcomes and academic performance. Studies comparing examination scores following different teaching modalities have demonstrated mixed results. Some investigators reported improved retention and performance with PowerPoint-assisted teaching due to enhanced visualization and structured content delivery.¹⁵ Others observed superior conceptual understanding and recall with chalkboard teaching because of increased interaction and active learning.⁹

The effectiveness of a teaching method may depend upon:

- Subject complexity
- Teaching skills of faculty
- Classroom size
- Student learning styles
- Availability of audiovisual resources
- Integration of clinical correlation

Therefore, no single teaching method can be universally considered superior for all educational situations.

Role of Teaching Methods in Competency-Based Medical Education

Competency-Based Medical Education emphasizes learner-centered teaching, integration of knowledge, communication skills, professionalism, and clinical competence. Modern teaching methods should therefore encourage active participation, critical thinking, and practical application of knowledge.¹⁶

Both PowerPoint and chalkboard teaching contribute differently to competency development:

- Chalkboard teaching improves interaction and analytical reasoning
- PowerPoint enhances visual learning and clinical integration
- Combined approaches promote multidimensional learning experiences

Faculty development programs are essential to train educators in effective use of both traditional and technological teaching methods.

Blended Teaching: The Ideal Approach

Contemporary educational research increasingly supports blended teaching approaches that combine traditional and digital methodologies. In blended lectures:

- Chalkboard is used for diagrams, flowcharts, and concept explanation
- PowerPoint is utilized for images, videos, animations, and summary points

Such integration improves attentiveness, conceptual understanding, and student satisfaction.^{3,14}

Blended teaching also accommodates diverse learning styles including visual, auditory, and kinesthetic learners, thereby enhancing inclusiveness in medical education.

Discussion

The present review demonstrates that both chalkboard teaching and PowerPoint-assisted teaching possess significant educational value in medical education. Chalkboard teaching remains highly effective for interactive learning, gradual explanation of concepts, and promotion of active student participation. Its slower pace allows students to follow the lecture systematically and develop effective note-taking habits.^{7,9}

In contrast, PowerPoint teaching offers substantial advantages in visualization, organization of content, and integration of clinical images, animations, and multimedia resources. It is particularly beneficial for large-group teaching and for topics requiring demonstration of complex anatomical structures, radiological findings, histological images, and surgical procedures.^{11,12}

However, excessive dependence on PowerPoint presentations may reduce teacher-student interaction and encourage passive learning if lectures are delivered rapidly without adequate explanation. Similarly, exclusive reliance on chalkboard teaching may limit exposure to audiovisual materials and consume considerable classroom time.¹³



Student perception studies consistently suggest that no single teaching method is universally superior. Instead, most medical students prefer integrated teaching approaches that combine the advantages of both modalities.³ Blended teaching promotes conceptual clarity, visual reinforcement, participation, and long-term retention of knowledge.

In competency-based medical education, effective teaching strategies should facilitate active learning, communication, professionalism, and clinical reasoning rather than mere transfer of information. Consequently, medical educators should adopt flexible, student-centered, and technologically balanced instructional methods tailored to learning objectives and classroom requirements.¹⁷

The future of medical education is likely to involve increasing integration of multimedia technologies, artificial intelligence-assisted learning, virtual simulation, and interactive digital platforms. Nevertheless, traditional teaching methods such as chalkboard instruction will continue to remain valuable because of their interactive and humanistic educational characteristics.

Conclusion

Both PowerPoint-assisted teaching and traditional chalkboard teaching play important roles in medical education. Chalkboard teaching promotes interaction, attentiveness, note-taking, and conceptual understanding, whereas PowerPoint teaching enhances visualization, organization, and multimedia-based learning.

Neither method alone can fulfill all educational requirements of modern competency-based medical education. A blended teaching approach integrating chalkboard explanation with multimedia presentations appears to be the most effective strategy for improving learning outcomes, student engagement, and academic performance among medical students.

Medical educators should therefore adopt flexible and student-oriented teaching methodologies that combine traditional educational strengths with modern technological innovations to achieve comprehensive and effective medical learning.

Declaration by Authors

Ethical Approval: Approved

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