ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

THE ROLE OF TECHNOLOGIES FOR DEVELOPING STUDENTS' CREATIVITY IN TEACHING LIVER AND BILIARY TRACT DISEASES IN MEDICAL EDUCATION

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Abstract. This article explores the role of technological advancements in enhancing students' creativity while learning about liver and biliary tract diseases. Traditional teaching methods often focus on memorization and passive learning; however, modern technologies such as virtual simulations, artificial intelligence, digital pathology, and interactive e-learning platforms foster deeper understanding and creative problem-solving skills. By utilizing these innovative approaches, medical students can engage in active learning, develop critical thinking, and improve diagnostic reasoning. The paper discusses various technological tools used in medical education and their impact on students' creativity in understanding hepatobiliary disorders.

INTRODUCTION

Technologies for developing students' creativity play an important role in teaching liver and biliary tract diseases in medical education. Through creative teaching methods, students not only master theoretical knowledge, but also develop the skills of applying it in practice, independent analysis and offering innovative solutions. Medical education has undergone a significant transformation with the incorporation of modern technologies. Teaching complex topics, such as liver and biliary tract diseases, requires innovative approaches to ensure students not only understand theoretical concepts but also develop practical diagnostic and problem-solving skills. In traditional medical teaching, students often rely on textbooks and lectures, which may limit their ability to apply knowledge creatively. However, technological advancements have introduced interactive learning environments that enhance engagement, critical thinking, and innovation.

MATERIALS AND METHODS

Methods for developing creativity:

1. Clinical cases of the disease (Case-study)

Students are presented with real or simulated clinical cases.

They develop a diagnosis, differential diagnosis and treatment plans.

Each group justifies its views, which develops logical thinking and a creative approach.

2. Role-playing and simulation methods

ISSN: 2692-5206
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Students are divided into roles such as "doctor", "patient", "laboratory assistant" and perform medical procedures based on different cases.

Diagnostic and treatment procedures are practiced in conditions close to real life using simulated patients.

3. Visual and interactive technologies

Explaining the pathogenesis of liver and biliary tract diseases using 3D models and AR/VR technologies.

Easily mastering complex processes through interactive electronic textbooks and animations.

4. Creative projects and startups in diagnostics and treatment

Students are assigned to create a project on new technologies, modern treatments or diagnostic methods.

They will have the opportunity to promote innovative ideas in medicine and engage in startups or scientific developments.

5. Gamification and Testing

Game-based learning: quizzes on disease detection, medical puzzles, diagnostic tests.

Developing team creativity through medical "quests" with an element of competition.

6. Application of artificial intelligence and analytical programs

Teaching students to use diagnostic systems based on artificial intelligence.

Provide tasks for data analysis and development of personalized treatment methods.

RESULTS AND DISCUSSION

Creativity is a crucial component of medical education, enabling students to approach clinical problems innovatively, adapt to new information, and develop unique solutions for patient care. In the context of hepatobiliary diseases, creative thinking allows future physicians to:

Develop individualized treatment plans for liver and biliary disorders.

Interpret complex diagnostic data, such as liver function tests and imaging results.

Identify novel research opportunities for liver disease management.

ISSN: 2692-5206
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Fostering creativity in medical students ensures they are well-prepared for the evolving challenges of healthcare, especially in hepatology, where new discoveries continue to reshape treatment protocols.

Virtual simulations and AR models allow students to visualize liver structures and biliary anatomy in three dimensions. These technologies provide:

Realistic case-based learning: Students can practice diagnosing and treating liver diseases in a simulated environment.

Immersive visualization: Enables a better understanding of liver histology, bile duct anatomy, and pathological changes in diseases like cirrhosis and cholestasis.

Interactive decision-making: Students can explore different treatment options and evaluate patient responses virtually.

AI-powered platforms analyze large datasets of liver function tests, imaging scans, and patient histories, offering students:

Predictive diagnostics: AI can help students practice diagnosing hepatic diseases based on patient symptoms and test results.

Personalized feedback: AI tutors provide tailored recommendations for improving clinical reasoning skills.

Creative problem-solving scenarios: AI-generated case studies present complex hepatobiliary conditions for analysis.

The integration of technology in medical education has revolutionized the way students learn about liver and biliary tract diseases. Virtual simulations, AI-driven learning, digital pathology, and interactive e-learning platforms provide creative and engaging learning experiences that enhance diagnostic reasoning and problem-solving abilities.

CONCLUSION

In addition to traditional approaches in teaching diseases of the liver and biliary tract, the use of modern interactive and innovative technologies develops students' logical thinking, independent decision-making, analytical and creative approaches. This will help them become highly qualified and modern doctors in the future.

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