iScience® Poland

# MODERN SCIENTIFIC CHALLENGES AND TRENDS

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# MODERN SCIENTIFIC CHALLENGES AND TRENDS

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# TABLE OF CONTENTS

## SECTION: ART STUDIES



## SECTION: EARTH SCIENCE



## SECTION: ECONOMICS



## SECTION: MEDICAL SCIENCE



## SECTION: PEDAGOGY

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

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## INTERACTIVE TEACHING METHODS IN HIGHER MEDICAL EDUCATION

***Abstract.*** *This article describes key interactive teaching methods for medical students: the standardized patient method, case study, role-playing, and debate. The experience of international and domestic medical schools is presented, demonstrating that role-playing and debate are well-received by students in the problem-based learning curriculum as effective teaching methods. Both methods are equally effective in improving students' communication skills. It is necessary to adopt and integrate these inexpensive experiential learning tools into medical education to promote active learning, enhance clinical reasoning and communication skills, explore real-world scenarios, and effectively deliver components of both basic and clinical medical subjects. In medical education, theoretical knowledge alone is not enough to create a better system of medical care. The one-way flow of knowledge from teacher to student (i.e., traditional didactic teaching) is no longer considered an effective method for enhancing competence and improving physician-patient relationships. Modern teaching methodologies that emphasize "interactivity," such as problem-based learning, role-playing, and debate, have been shown to provide a more effective basis for enhancing competence in providing health care.*

***Keywords:*** *learning, higher medical education, interactive learning*

### Introduction

Modern healthcare development is characterized by trends common to many countries worldwide. First and foremost, the growing role of modern biotechnology in the diagnosis and treatment of diseases is noted. High-tech diagnostic methods, including functional, radiation, and endoscopic methods, are being refined. Robotic and laparoscopic surgical techniques are widely used in surgery. Genetic screening methods and new original medications, including those created using genetic engineering, are actively used in therapeutic practice. Research is underway on the therapeutic use of stem cells and cellular technologies. Reproductive medicine methods aimed at increasing the birth rate are being refined. However, the experience of concentrating advanced technologies in research centers has shown their ineffectiveness. The

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

goal of healthcare organization is to increase the availability of medical care to the population, thereby increasing the role of prehospital medical services. At the same time, preventive measures to reduce morbidity and mortality remain relevant. Vaccines are being actively developed to prevent HIV/AIDS and a number of oncological diseases. Improving the environment, combating harmful factors, and promoting healthy lifestyle principles are crucial for disease prevention [1].

Improving the delivery of medical care is inextricably linked to improving the quality of medical personnel training. A physician's medical education encompasses several stages, including undergraduate, higher professional, postgraduate, and continuing professional development. In 2002, this concept was adopted at the World Conference on Medical Education in Copenhagen. Particular attention is being paid to continuing professional education in the context of the constant modernization of healthcare, which significantly determines the effectiveness of medical care.

To improve the quality of physician training, new training standards and curricula are being developed and optimized, and educational technologies and forms of education are being implemented and improved. Along with mastering a broad range of theoretical knowledge and acquiring professional skills and competencies, mastering clinical reasoning and communication skills is of great importance as a key professional skill for providing high-quality patient care [2, 3]. Psychological preparation for the future role of a physician in medicine is becoming an important task in student education [4, 5]. For this purpose, interactive teaching methods are successfully used in training, including case studies, role-playing games and debates, where students are offered the opportunity to perform their professional roles and responsibilities [6].

**Aim:**

This study is to evaluate interactive teaching methods in medical education. It focuses on improving students' communication skills and clinical reasoning through active learning. The study highlights the importance of integrating experiential methods with theoretical teaching.

**Materials and Methods:**

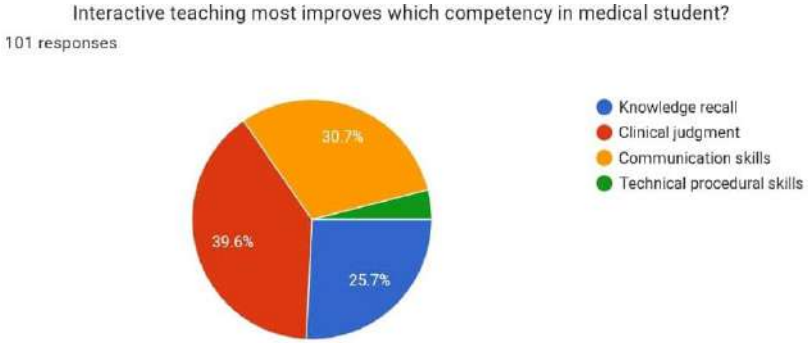
This study employed a descriptive, cross-sectional design to evaluate medical students' perceptions of interactive teaching methods, including case-based learning, standardized/simulated patients, role-playing, and debate within a problem-based learning curriculum. The study participants were undergraduate 2$^{nd}$ year students of International Medical faculty of Osh State University who had prior exposure to these interactive learning strategies during their coursework. Data were collected using a structured, self-administered questionnaire created with Google Forms. The questionnaire assessed students' views on the effectiveness of each teaching method in improving communication skills, clinical reasoning, active learning, and integration of basic and clinical knowledge. Participation was voluntary, and responses were collected anonymously. The collected data were compiled and analyzed using descriptive statistical methods to summarize students' perceptions and comparative evaluations of the teaching approaches.

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

**Results:**

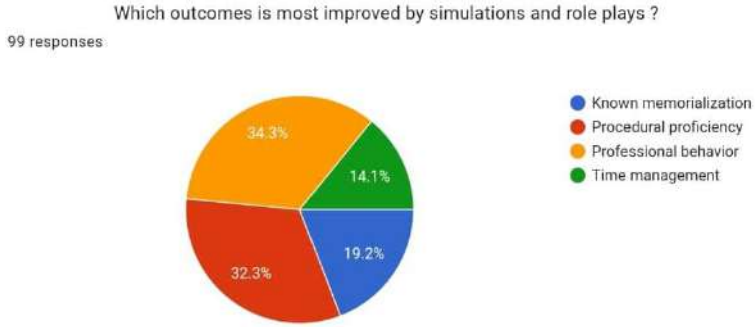
**1. Google forms:**

*Diagram 1: Impact on Student Competencies:*




This survey of 101 respondents explores which specific competency is most enhanced through interactive teaching methods. The data reveals that a significant plurality of participants, nearly 40%, believe clinical judgment sees the greatest improvement. Communication skills and knowledge recall also received notable support at 30.7% and 25.7% respectively, while technical procedural skills were seen as the least impacted. Overall, the results suggest that interactive learning is most valued for developing high-level decision-making and diagnostic abilities in medical students.

*Diagram 2: Outcomes of Simulations and Role Plays:*

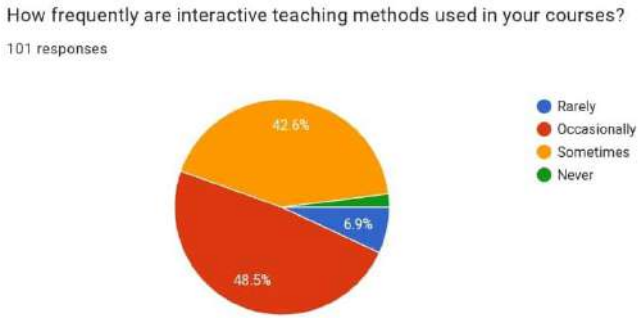



Based on 99 responses, this chart identifies the primary outcomes improved by utilizing simulations and role-playing exercises. Professional behavior emerged as the leading outcome at 34.3%, closely followed by procedural proficiency at 32.3%. Known memorialization and time management were ranked lower, suggesting these immersive methods are less about rote facts

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

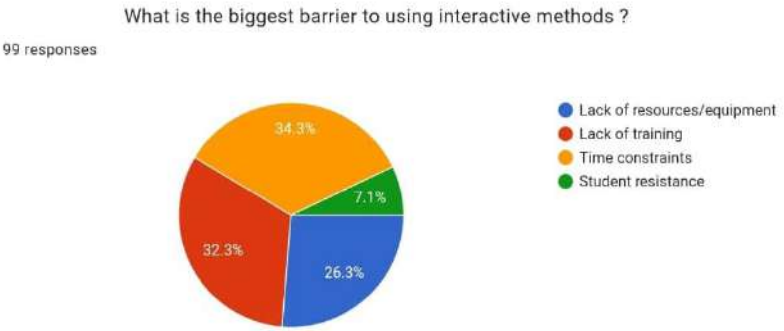
and more about behavior. These findings indicate that simulations are highly effective tools for bridging the gap between theoretical knowledge and professional conduct.

*Diagram 3: Frequency of Interactive Teaching:*




This diagram illustrates how often interactive teaching methods are implemented within courses, drawing from 101 responses. Most respondents indicate that such methods are used only "Occasionally" (48.5%) or "Sometimes" (42.6%). Only a tiny fraction of the data shows these methods being used "Rarely" or "Never," yet the "Always" category is notably absent from the top results. This suggests that while interactive teaching is recognized and utilized, it has not yet become the dominant daily standard in medical curricula.

*Diagram 4: Barriers to Using Interactive Methods:*

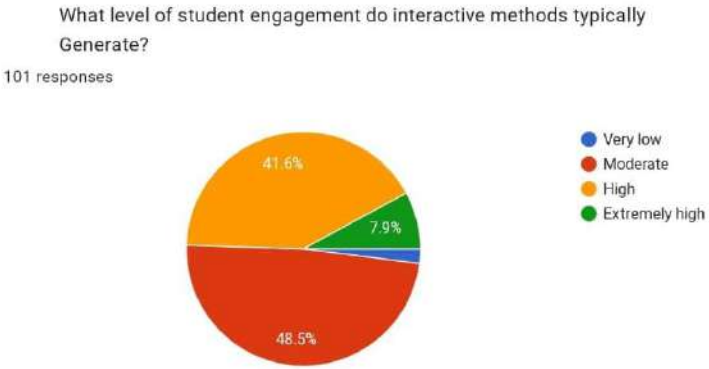



Analyzing 99 responses, this chart highlights the most significant obstacles preventing the wider adoption of interactive teaching styles. Time constraints are identified as the primary barrier at 34.3%, with a lack of training following closely at 32.3%. Lack of resources and equipment also presents a major hurdle for over a quarter of the participants, while student resistance remains a minor concern at only 7.1%. The data implies that to increase interactivity,

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

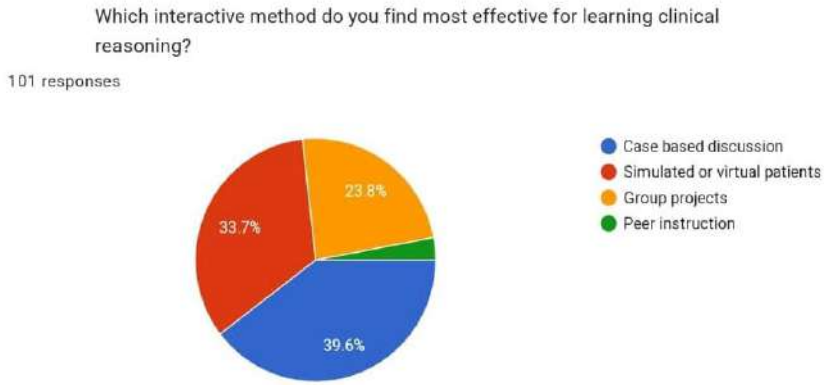
institutions must focus on better scheduling and providing faculty with the necessary training and tools.

*Diagram 5: Levels of Student Engagement:*




This survey of 101 respondents measures the level of student engagement that interactive methods typically generate in a classroom setting. Almost half of the participants reported a "Moderate" level of engagement, while a substantial 41.6% observed "High" levels of student involvement. Only a small percentage of respondents experienced "Extremely high" or "Very low" engagement, creating a bell-curve distribution. These results confirm that interactive methods are generally successful at maintaining student interest and participation compared to traditional passive learning.

*Diagram 6: Effectiveness for Clinical Reasoning:*




The final diagram evaluates which specific interactive method is most effective for teaching clinical reasoning, based on 101 responses. Case-based discussion is the preferred

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

method for 39.6% of respondents, making it the most popular choice for developing reasoning skills. Simulated or virtual patients also scored highly at 33.7%, while group projects and peer instruction were seen as less effective in this specific area. The findings suggest that real-world scenarios and discussion-led analysis are the gold standard for teaching students how to think like clinicians.

2.**Analytical Review**

The article provides a clear and comprehensive overview of interactive teaching methods in medical education, highlighting the limitations of traditional lecture-based learning and the importance of experiential approaches such as case-based learning, standardized patients, role-playing, debate, and problem-based learning. It effectively demonstrates that these methods enhance communication skills, clinical reasoning, teamwork, and student engagement, with role-playing and debate being particularly well received by medical students.

To support this review, student perceptions were analyzed using a structured questionnaire distributed through Google Forms. The review analysis confirmed the article's findings, showing that students valued interactive methods for promoting active learning, real-life clinical understanding, and improved physician–patient communication, reinforcing the need to integrate these approaches into medical curricula.

**Case Study Method**

Training is not only about acquiring clinical knowledge or skills but also about facilitating students' participation in medical practice. Case-based learning is currently being used and actively developed for training and professional development abroad. This research-based approach is used to achieve a deep and comprehensive understanding of a complex problem in a real-life context. Case study methods differ fundamentally from problem-based learning in that they are based on specific examples [7]. Cases in medicine serve as an interactive means of analyzing a specific situation reflecting a patient's health condition, conducting differential diagnostics, and choosing treatment strategies. The relevance of the case method in Russian medical education is determined by the Federal State Educational Standard, which emphasizes the need for active and interactive learning formats: computer simulations, business and role-playing games, case studies, psychological and other training sessions, group discussions, etc. The use of the case method complements traditional teaching methods (lectures, seminars, and practical classes) and is aimed not so much at acquiring new knowledge as at developing professional competence, skills, and cognitive abilities. The case method, as used in medicine, includes a set of clinical cases that are presented to students for interactive analysis during their training. The use of multimedia technologies in medical case studies helps them better understand a patient's complex problem, for example, when diagnosing a rare disease. A case typically includes objective patient data: photographs and videos of the examination with comments from the attending physician and other specialists, recordings of the patient's characteristic voice, the results of previous tests, and formulations of questions that arise during the diagnostic process. Important components of the case method include assessing the student's actions and explaining any mistakes made [7].

Independent work by medical students has many characteristics that distinguish medical science from all others. Medicine encompasses many sciences, evolving alongside them and representing a continuum of multiple disciplines. The role of the instructor during the

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

transition to the case method is to develop and implement individual cases into the learning process and is applicable to the medical education system: the instructor creates a set of various clinical situations for students to analyze.

In practical work, structured, unstructured, and discovery cases are most often used. Structured cases involve presenting a specific situation with defined values and data as concisely and accurately as possible. Such a case has a set number of correct answers. These answers are necessary to assess the level of knowledge or ability in the use of a specific formula, skill, or methodology in various areas of medicine.

Unstructured cases, on the other hand, contain a large amount of data. They are aimed at assessing a student's style and ability to think quickly, their ability to identify key points, and their ability to apply theoretical knowledge practically. They contain multiple correct answer options, usually including the possibility of finding an alternative solution to the problem. Pioneering cases allow instructors to assess a student's ability to think outside the box and determine the number of creative ideas they generate over a given period of time. This type of case allows for individual students to pick up a key idea during group decision-making, develop it in various directions, and use it in their practical work. However, the state of medical students' practical training is a rather complex issue for many specialized medical universities in the Russian Federation, regardless of their status. Current standards do not sufficiently define the importance of simulation training. Simulation centers independently established by universities often replace clinical training with bedside teaching, relying on mannequins and an algorithmic approach to situations. This has a profoundly negative impact on the development of clinical disciplines and, subsequently, after students receive their higher education diploma, their practical application in healthcare [8].

The case method is a fairly effective means of organizing training and can be easily integrated with other teaching methods. For example, this method can be considered a new teaching method from a methodological perspective. However, it is aimed not so much at students mastering specific skills and abilities as at developing their erudition and communication skills. It allows students to reinforce the practical skills presented in a given case.

**The "Standardized Patient" Methodology**

The "standardized patient" method is used in medical student education to develop clinical reasoning and counseling practice, while also helping to hone communication skills. Patient counseling is increasingly recognized as an essential component of high-quality healthcare. One important aspect of counseling is the ability to communicate unexpected or unwelcome news to patients and their families, such as when parents need to tell them that their young child has hearing loss. A clinician's ability to effectively and sensitively provide information and emotional support to people facing unpleasant news is crucial, as it can impact the quality of the ongoing doctor-patient relationship and the success of the appropriate intervention.

One approach to addressing students' challenges in counseling difficult situations is to employ actors trained to portray patients, allowing students to practice their new skills in a realistic yet controlled setting. Actors can be used to teach and assess various skills, including interviewing patients, performing physical examination and diagnostic techniques, and

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

communicating information to families. As described by Austin et al. (2006) [9], subjects can be instructed to standardize their portrayal by repeating the same symptoms, reactions, questions, and results session after session, i.e., they act as "standardized patients." Standardized patients are particularly useful for teaching and assessing diagnostic skills, as specific and repeatable clinical actions can be key.

On the other hand, if the focus is on teaching and assessing interpersonal skills, subjects can be instructed to develop a specific persona (e.g., a frustrated patient) and use their improvisational skills to imitate an authentic patient. For these so-called simulated patients, the goal is to mimic the complexities of real human interactions.

Standardized and simulated patients have been used for many years to successfully acquire clinical and patient communication skills for medical, dental, and pharmacy students. Students value experiential learning methods because they can practice new skills without risk of patient harm and receive feedback on their developing clinical abilities, including those related to effective physician-patient interactions. Recently, standardized and simulated patients have been incorporated into audiology education through the use of formal standardized patient training tools housed in medical schools and through instructors developing and implementing simulation experiences in their courses [10].

One such example is the audiology program at Central Michigan University (CMU), where since 2007, simulated patients have been used to support the teaching of counseling skills related to delivering bad news to patients and their families. Because the CMU program uses a simulated rather than standardized patient model, each actor is instructed to create a character and then improvise appropriate behaviors and reactions during their counseling session(s) [10].

Thus, although the topic of delivering bad news is consistent among students and clinical course participants, each simulated patient counseling session is unique. After each session, students review their videotapes and evaluate their effectiveness. They also receive performance evaluations from their instructors.

While research shows that medical students believe that the inclusion of standardized and simulated patient encounters is an important and valuable part of their training, only one study has currently similarly addressed students' views on the use of actors in audiology training. W.J. Wilson et al. (2010) examined student reactions to two aspects (history taking and explanation of research findings) with actors trained to portray patients and found that students agreed that these encounters improved 10 of the 10 clinician-patient interaction skills examined. While this is encouraging, more data is needed to better understand student perspectives on the use of simulated patients as a teaching method and, therefore, the potential value this model may have in advancing audiology education [11].

Accordingly, the aim of the present study was to interview CMU students who participated in simulated patient counseling sessions, as described above, and to assess their experiences and perspectives on this educational format. The goal was also to better understand, from the student perspective, the role and significance of simulated patient experiences in audiology counseling education. This study surveyed students who had participated in a simulated patient counseling session to determine their views on its value as a training format. Overall, the results showed that students viewed the use of simulated

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

patients as an effective method for improving audiology counseling skills, particularly in the scenario of navigating difficult circumstances, which is typically viewed as challenging by students and novice clinicians. Most of the interviewed participants: 1) reported that the experience with simulated patients and associated activities (e.g., class discussion) facilitated the identification of strengths and weaknesses in counseling and 2) recommended the simulation for other students [10].

The ultimate goal of counseling skills in audiology is to help student clinicians meet patients' communication needs by becoming flexible and adaptive communicators. Students interviewed in this study reported that working with simulated patients, along with feedback from their instructor and peers, helped them identify their strengths and weaknesses in counseling.

The model examined in this study provided students with useful feedback in two ways. First, most participants reported that the debriefing with the instructor immediately after the patient simulation session was instructive, likely because this meeting provided timely and appropriate feedback and allowed students to identify initial problems. Second, after the patient simulation, participants reviewed the situation in class, where students watched each other's recorded sessions and openly discussed strengths and weaknesses. Students who can independently assess and identify their communication strengths and weaknesses during training may be more likely to use and develop effective counseling techniques as they advance in clinical training and ultimately in their professional careers.

Breaking bad news to patients is one of many patient interactions that requires in-depth training and preparation.

The students participating in this study suggested three types of encounters that would be useful for future counseling practice: those in which the patient: 1) becomes hostile; 2) uncommunicative; and 3) chatters.

One possible example of this would be a single actor working sequentially with several students, each continuing where the previous student left off, in a continuous, uninterrupted interaction. Other ideas include one-day workshops, online training, or a combination of these approaches. Overall, the results of the present study indicate that students view the use of simulated patients as an effective method for improving their clinical counseling skills, particularly when learning to deliver difficult news [12].

**Problem-Based Learning as a Method of Interactive Education**

**Problem-based learning (PBL)** is an instructional approach increasingly used in the education of many healthcare professionals worldwide [13-15]. PBL utilizes social learning principles, which enhance group discussions and, consequently, promotes the development of interpersonal, communication, and presentation skills, knowledge retention, improved problem-solving abilities, and better integration of fundamental science and clinical skills [16-19]. PBL requires problem-based learning, mentors, students, and a small-group discussion process [20, 21].

An example of the successful implementation of PBL in medical student curricula is Imam Abdulrahman Bin Faisal University (Saudi Arabia), which adopted a PBL curriculum in 2014. The University's curriculum emphasizes communication and clinical reasoning skills. The primary integrating methodology of their curriculum is problem-based learning, along with a

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

variety of other methods, including tutorials, tutorials, practical exercises, simulations, student presentations, and small-group learning, supported by role-playing, debates, and discussions. Published research has shown that medical students are satisfied with PL and believe that this methodology improves many aspects of the learning process [22-26].

A comparative evaluation of the effectiveness of role-playing and discussion sessions used in small-group discussions during PL was conducted from the medical students' perspective. Students in each group were divided into 10 small PL subgroups (10-13 students) and participated in problem-based learning sessions weekly. During the first semester, students focused on the effectiveness of debates in general. In the subsequent semester, both strategies (role-playing and debate) were used simultaneously, with a particular emphasis on communication skills and clinical reasoning. The learning strategies used during the PO sessions included individualized, self-directed learning through role-playing and discussions specifically designed to improve their communication skills and clinical reasoning. The discussions and role-plays covered topics such as physician-patient interactions, prenatal screening, genetic testing, immunization, and alcohol abuse. In practice, this looked like this:

1. Topic: Doctor-patient relationships. Discussion: What are the pros and cons of having computers in the doctor's office and of patient access to computers during doctor-patient interactions? Role-play: Prepare and conduct a role-play depicting the negative and positive relationships between doctor and patient in a clinical setting.

2. Topic: Predictive genetic testing. Discussion: The pros and cons of preventive surgery (mastectomy). Role-play: Can people from high-risk families benefit from information about whether they have a genetic mutation (role of the doctor)? Could the results of these tests cause problems?

3. Topic: Immunization. Discussion: Should all children be immunized against whooping cough before entering school? Role-play: Prepare a mock trial. A child died from complications of a disease for which he was not immunized. The parents were charged.

The study compared the effectiveness of these two teaching tools from the students' perspective. Students were asked about improving communication skills across four components (alleviating potential communication difficulties, learning new ways to communicate, improving listening skills to persuade others, and promoting teamwork). The study's results are consistent with the findings of most published studies, which have documented improvements in communication skills through debates [27, 28] or role-playing alone. No significant differences were noted between the two teaching methods [37-40]. When the student was asked about clinical thinking skills from 4 different perspectives (i.e., integrating basic and clinical medical science knowledge, opening new avenues of thinking, reflecting on real-life experiences, and changing perspectives on subjects), debate was superior to role-play in opening new avenues of thinking ($p=0.01$). Taking into account the integration of basic medical science knowledge with clinical skills and reflection on real-life experiences, students also rated role-play as superior to debate ($p=5.01$ and 0.00, respectively). There was no significant difference in the ratings of debate and role-play in terms of changing students' perspectives on subjects. On the other hand, for the debate series, students conducted a comprehensive investigation of the issue, collected supporting/refutable evidence, summarized important points, and divided responsibilities. Ultimately, this exercise resulted in improving

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

their communication skills, leadership and teamwork skills, and sharpened their ability to see issues from different perspectives. Sometimes they had to support proposals they themselves didn't believe in. They learned more about their strengths and weaknesses through collaboration with their peers. They developed a better understanding of the topics and not only learned more information but also retained it more effectively. Confidence, reinforced by critical analysis, improves decision-making and paves the way for improved communication skills. Therefore, the use of role-playing and debate as teaching tools during the PE program helps medical students effectively develop these skills.

**Role-playing is** a technique in which students work with roles in the form of a case or scenario and then act out the roles for educational purposes [29]. Role-playing is spontaneous human interaction that involves realistic behavior in artificial or imaginary settings. It is an excellent example of andragogy, or M.S. Knowles's adult learning theory, which focuses on the learner's need for knowledge, self-direction, varied experiences, and a problem-oriented approach [30]. In debates, students discuss two or more sides of a problem, citing facts and key points [31].

The use of **business games** is successfully applied in the educational process of students at the International medical faculty of Osh State University. One example is a business game aimed at practicing medical students' communication skills with patients to strengthen their commitment to a healthy lifestyle and combat bad habits. The feasibility and necessity of developing effective approaches to the prevention of major human diseases, especially cardiovascular diseases, is undeniable. This explains the growing need to create and develop preventive programs based on established standards for the effectiveness of evidence-based preventive programs. In recent years, government efforts have been focused on promoting healthy lifestyle principles. Prevention programs are actively implemented in the healthcare system, including medical screenings, preventive examinations, and public education sessions at Health Centers, as well as in prevention departments and health schools. Healthcare professionals are responsible for providing preventative counseling to patients in an accessible format about the harm of key risk factors: smoking, obesity, dyslipidemia, physical inactivity, hyperglycemia, and others. Quitting bad habits is a significant medical issue, associated not only with their prevalence but also with psychological aspects. Counseling involves invading the patient's privacy and persuading them to give up activities they enjoy. This requires not only medical knowledge but also experience in discussion and persuasion. A business simulation can be an opportunity to develop these skills in future doctors.

In preparation for the business simulation, students are explained the goals, structure, and format of the discussion. For role-playing sessions, students divide the roles of "actors" between the patient and the doctors conducting the consultation. The patient prepares to play the role of a patient with multiple risk factors, prepared to be interviewed by their classmates during the simulation. To make the lesson more lively and dynamic, the student playing the patient requires a certain amount of artistic talent. During the anamnesis, they will have to portray a person, often in an older age group, present a specific anamnesis to colleagues, and actively engage in discussions about risk factors, rather than simply accepting their colleagues' arguments. One student plays the role of the attending physician, whose tasks include collecting the anamnesis, making a preliminary diagnosis, prescribing an examination plan, and,

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

at the end of the lesson, prescribing treatment and providing additional recommendations. At the initial stage, in addition to the "patient" and "attending physician," other students can join in the role-playing, creating a simulated consultation. Students, in the role of the consulting physician, prepare a topic on one of the risk factors. Students strive to make the role-playing environment realistic by bringing appropriate objects for the created scenes, such as a stethoscope, blood pressure monitor, cigarettes, bottles of counterfeit alcohol, fast food, etc. The student-created scenes were evaluated using standardized templates provided during clinical skills classes. During a counseling conversation, speech should be free of technical jargon and should be adapted as much as possible to the patient's comprehension. Students can begin the role-play with a presentation, video clip, or story about the harm of risk factors. This is followed by a debate between the patient and the physician. The discussion session consists of arguments, objections, rebuttals, and concluding statements, followed by open discussion and judgment. Participants in the business simulation are given ample time one week to prepare and a maximum of 15-20 minutes to discuss each topic. Certain stages can be challenging for students. For example, the anamnesis collection and consultation process can sometimes drag on, and students, by inertia, continue to conduct the discussion as they would in a seminar, expecting support and feedback from the instructor. Debates can become passive. The instructor should make adjustments to the discussions, maintain the dynamism of the business simulation, but avoid becoming a participant, giving the leading role to the students. Results are assessed not only by the volume of information presented and the accuracy of judgments, but also by the persuasiveness of the arguments presented and the participants' active position.

**The role-playing games** allowed students to better understand the doctor-patient relationship and provided them with a clear picture of their response as doctors in realistic, serious, complex, and ambivalent professional situations. The debates provided experience in reasoned responses using language accessible to the patient. Role-playing can be modified by discussing the role with one of the participants beforehand. For example, a role-play of doctor-patient interactions could consist of two parts: poor and good communication skills. In the poor communication skills role-play, the "doctor" allows the patient to enter the room and look around while the doctor is still working on paperwork. The doctor asks questions without eye contact. In contrast, in the "good communication skills" role-play, the doctor introduces himself correctly, apologizes for the long wait, maintains eye contact, and actively conducts the interview. This experience allows the student to assess the doctor's demeanor through the eyes of the patient. A certain alternative or supplement to the role-playing was a situation in which a real patient, particularly a long-time smoker, became a participant at one stage, and the students' task was to convince him to quit. It is known that, while smoking is one of the most significant risk factors for many diseases, quitting smoking is particularly difficult, as this habit is associated with psychological and physical dependence. Students' level of responsibility for conducting preventive discussions in this situation significantly increased, as the model was as close to reality as possible, and the patient had active counterarguments in the discussion. Role-playing provided students with the opportunity to learn how to work in challenging situations that may arise when they begin their careers in the community. Thus, students

SCIENCECENTRUM.EU ISSUE 1(79) ISBN 978-83-949403-3-1

perceived role-playing as more realistic than debates. Similarly, role-playing, compared to debates, better integrated basic medical science with clinical skills.

**Conclusion**

Role-playing and debate are well-received by students in the medical curriculum as effective teaching methods. These methods are equally effective in improving students' communication skills. It is imperative that these inexpensive experiential learning tools be adopted and integrated into medical education to promote active learning, improve clinical reasoning and communication skills, explore real-world scenarios, and effectively deliver components of both basic and clinical medical subjects. Experience with business games demonstrates the effectiveness of role-playing and debate methods. When used correctly, these two methods (role-playing and debate) can create educational associations that will last for years. This brings variety, fun, motivation, and accelerates the pace of learning. Ultimately, students gain a better understanding of the topic simply because they are actively engaged in the learning process.

In medical education, theoretical knowledge alone is not sufficient to create the best healthcare delivery system. The skills required of a good physician include clinical problem solving, judgment, decision-making, communication, evaluation of medical information, and therapeutic knowledge. These skills are crucial for practicing physicians [32]. The one-way flow of knowledge from teacher to student (i.e., traditional didactic teaching) is no longer considered an effective method for enhancing competence and improving physician-patient relationships. Modern teaching methodologies that emphasize interactivity, such as software, role-playing, and debate [32], have been shown to create a more effective foundation for enhancing competence in the provision of healthcare.

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