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FUTUREMED: Transformative Era of Higher Education
PRELIMINARY BOOK OF ABSTRACTS

This Book of Abstracts presents a preliminary compilation of abstracts accepted for the MEDRI 2025 Conference. All abstracts are published in the original form submitted by the authors and have not undergone proofreading or graphic editing. Institutional affiliations are also displayed as provided by the authors. The final version of the Book of Abstracts will be published as a supplement to the scientific journal *Liječnički vjesnik*.

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Session C2. EVIDENCE-BASED MEDICAL EDUCATION: WHY EDUCATIONAL RESEARCH MATTERS?

RESEARCHING HEALTHCARE PROFESSIONS EDUCATION: WHY BOTHER?

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Around 82,000 medical education-focused articles were published in over 4,000 different journals between the years of 1960 and 2010, with an 8-fold annual increase over time. In 2014, over 1,500 manuscripts were submitted to the top international journal *Medical Education* alone: a 53% increase since 2007. And this trend continues in educational research across the healthcare professions more generally. But healthcare professions education research suffers from being the poor relation to healthcare research, attracting relatively little funding and kudos it has been labeled the "*ugly duckling* of the medical world". So why do we bother? In this talk, Lynn will explain why she thinks healthcare professions education research is just as important as clinical research. In doing so she will define what healthcare professions education research is, talk about who undertakes healthcare professions education research, and explaining how and why healthcare professions education research can really make a difference: for healthcare professionals themselves, for organisations, as well as for patient care quality. Following this, she will encourage you to think about researching your own healthcare professions education interests by considering the kinds of research questions that might be of interest to medical educationists locally, nationally and internationally.

Keywords: Educational Research; Healthcare Professions Education; Medical Education

EVIDENCE-BASED MEDICAL EDUCATION: INTRICATE SCIENCE BEHIND INTUITION

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The concept of evidence-based medical education (EBME) is increasingly recognised as a cornerstone of modern higher education, guiding the development of teaching and learning practices in medicine. While intuition, experience, and professional judgment have always played an essential role in how medical teachers educate future healthcare professionals, EBME highlights that even these intuitive decisions can - and should - be systematically understood, supported, and refined through scientific evidence. Without a structured and evidence-based framework they risk becoming subjective, inconsistent, or less effective. In addition, EBME reminds us that education, like medicine itself, has a rigorous scientific foundation - one that is too frequently overlooked in favour of tradition, habit, or personal preference, even though it directly influences both learning outcomes and patient care. However, EBME does not suppress intuition but rather elevates it by revealing the science, cognitive mechanisms, and pedagogical theories that underpin effective educational decisions, enabling teachers to make informed and deliberate choices with confidence, such as selecting evidence-based content, applying validated teaching methods, and continually evaluating outcomes. In modern medical education, intuition is informed, deliberate, and integrated into a scientific framework rather than improvised or assumed, which is emphasised by numerous unsuccessful curriculum reforms that have demonstrated that relying on subjective opinions alone is insufficient. Unfortunately, educational research is too often perceived as secondary to basic and clinical research, despite being crucial for preparing competent, reflective, and safe healthcare professionals.

The aim of this presentation is to introduce the EBME concept and illustrate its implementation at the Faculty of Medicine in Rijeka, where educational practice is being transformed through innovative and scientifically grounded approaches. Selected examples include a clinical reasoning and a clinical skills course for medical students (Medical Genetics, Clinical Propedeutics), and a faculty development programme Modern and Practical Medical Education. These examples highlight numerous pedagogical innovations and the digital transformation introduced at the institution, including case-based learning, flipped classroom methodology, competency-based assessment, contemporary standards of clinical teaching, and faculty development. Finally, the presentation highlights the role of the Centre for Improving Teacher Competencies and Communication Skills, the institutional unit responsible for the implementation of the EBME concept across the Faculty.

Keywords: Evidence-Based Medical Education; Educational Research; Faculty Development; Healthcare Professions; Intuition; Medical Education

UNDERSTANDING THE SPECIFICITIES OF GENERATION Z

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The aim of this presentation is to provide an overview of the main characteristics and social implications of Generation Z, based on international and Croatian research, and to discuss their relevance for education, employment, and intergenerational cooperation. Generation Z, or "zoomers", born approximately between 1995 and 2012, is the first generation that has never experienced a world without the internet. Growing up in a fully digitalized and globalized environment has shaped their values, communication preferences, and expectations. Research consistently shows that this cohort is highly self-aware, pragmatic, and places strong emphasis on authenticity, inclusiveness, and diversity. They are sceptical of rigid hierarchies and traditional institutions, and they demand flexibility both in education and in the workplace. They prefer experiential and practical learning, and they value meaningful work, financial security, and work-life balance. In Croatia, findings further emphasize their specific career expectations. Generation Z tends to value autonomy, managerial competence, and entrepreneurial creativity more than older cohorts, while remaining sceptical toward human resources systems, which they often perceive as reactive and administrative rather than supportive of long-term career development. Research on Croatian youth also indicates a growing dissatisfaction with the quality of education and concerns about integrity in higher education. They highlight a mismatch between qualifications and labor market opportunities, while at the same time relying heavily on digital tools and non-formal online learning to complement their formal education. Although frequently labelled as "lazy" or "spoiled" by older generations, many members of this cohort have transformed their digital skills and even their so-called "dependence" on technology into innovative business models and careers. In Croatia, as elsewhere, they articulate clear expectations from both employers and educational institutions and actively seek environments that meet these expectations. This presentation emphasizes that fostering intergenerational dialogue and understanding is essential for harnessing the potential of Generation Z and for building more flexible, inclusive, and future-oriented social structures.

Keywords: Career Development; Communication; Education; Employment; Generation Z; Students

RELATIONSHIP BETWEEN PERSONALITY TRAITS, EMOTIONAL INTELLIGENCE, AND ACADEMIC SUCCESS

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Aim: This study aimed to examine the impact of personality traits and emotional intelligence on academic success.
Materials and Methods: The research was conducted among 260 fourth-grade students (58 male and 202 female) from two high schools in the southern region of Bosnia and Herzegovina. The Sixteen Personality Factor Questionnaire (16PFQue) was used to assess personality traits, and the Trait Emotional Intelligence Questionnaire (TEIQue) was used to measure emotional intelligence.
Results: Anxiety and self-sufficiency were the most prevalent traits among students. Tough-mindedness was significantly more pronounced in students with an average grade of "excellent" compared to those with an average grade of "good." Conversely, sensitivity and tension were significantly more common among students with an average grade of "good" compared to those with an average grade of "excellent." Tough-mindedness showed a positive correlation with academic success, while anxiety, liveliness, sensitivity, apprehension, openness to change, and tension were negatively correlated. No significant differences in emotional intelligence were observed between the groups.
Conclusion: Our findings suggest that certain personality traits may have a significant impact on academic success, whereas emotional intelligence appears to have no effect. However, future multicenter studies with larger cohorts are warranted to further clarify the role of personality characteristics and emotional intelligence in academic achievement.

Keywords: Academic success; Emotional intelligence; Personality traits; Students

TEACHING SOFT SKILLS IN THE DIGITAL AGE: HOW TO HUMANIZE MEDICAL EDUCATION FOR GENERATION Z

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In the context of increasingly complex challenges in medical education—particularly in working with Generation Z students—it is essential to redefine pedagogical strategies aimed at fostering professional competencies that encompass emotional as well as cognitive dimensions. The objective of this presentation is to underscore the significance of integrating soft skills into the medical curriculum, with particular focus on emotional literacy, empathic communication, interpersonal competence, and the formation of professional identity. Generation Z is marked by a high degree of digital fluency, constant immersion in virtual environments, and a preference for rapid, visual modes of communication. However, they also exhibit heightened psychological vulnerability, emotional disorientation, limited socio-emotional competencies, and a growing prevalence of loneliness and anxiety. Within this context, it is imperative that educators not only possess subject-matter expertise but also demonstrate the ability to create psychologically safe learning environments that promote authentic communication, emotional mirroring, and the cultivation of trust. The traditional role of the teacher as the sole transmitter of knowledge has shifted toward that of a mentor who facilitates the development of clinical reasoning, emotional self-reflection, and effective patient-centered communication. This paper outlines concrete pedagogical strategies such as facilitating reflective dialogue, role-play, nonverbal communication analysis, and supporting students in recognizing and articulating their own emotional responses. The educator's role extends beyond content delivery to modeling professional behavior aligned with the principles of emotional intelligence. Particular emphasis is placed on the importance of active listening, nonverbal sensitivity, and empathic responsiveness as foundational clinical competencies in contemporary medical practice. In conclusion, without systematic instruction in and cultivation of soft skills, future physicians may become technically proficient yet emotionally disengaged—compromising both the therapeutic alliance and the overall quality of care. Rather than fearing the technological adeptness of newer generations, educators should recognize that their greatest asset lies not in digital expertise but in life experience, emotional maturity, and the capacity to guide students in the development of their professional identity through genuine human connection, critical inquiry, and ethical reflection.

Keywords: Empathy; Emotional Intelligence; Generation Z; Interpersonal Communication; Medical Education

ONLINE PLATFORMS FOR INTERACTIVE LEARNING: COMPARISON, POSSIBILITIES AND ADVANTAGES

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The aim of this presentation is to examine the use of online platforms for interactive learning, with a focus on their comparative features, possibilities, and educational benefits. Online platforms increasingly serve as essential tools in higher education by offering flexible access, diverse resources, and opportunities for active engagement. Through a comparison of widely used solutions, attention is given to aspects such as accessibility, user experience, integration of multimedia, and support for collaborative learning. Emphasis is placed on the interactive elements such as real time communication, gamification, adaptive feedback, and group work that transform traditional learning into a dynamic, student-centred process. These features not only enhance motivation and participation but also contribute to deeper understanding and long-term knowledge retention. The possibilities of online platforms extend to personalized learning pathways, continuous assessment, and bridging formal with informal education, making them adaptable to a broad range of disciplines. Despite challenges such as technological requirements and the need for pedagogical redesign, the advantages of inclusivity, scalability, and adaptability highlight their growing importance. In the presentation, examples will be given of platforms already in use, such as Moodle and its national version Merlin, as well as tools that foster active participation like Kahoot and global resources such as Coursera, to illustrate how different types of platforms complement one another in supporting medical education.

Keywords: Computer-Assisted Instruction; Educational Technology; Medical Education; Online Systems

NEXT-GEN MEDICAL EDUCATION: INP'S DIGITAL SOLUTION FOR TEACHING AND LEARNING

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The growing complexity of medical education and the need for efficiency, transparency, and student-centred learning have led the Faculty of Medicine, University of Rijeka, to develop INP—an integrated digital platform that supports and enhances all aspects of teaching and learning. This institution-wide solution addresses challenges in academic organisation, clinical training, quality assurance, and communication between students and faculty. INP consolidates classroom administration, timetable coordination, syllabi for all study programmes, and lecture room reservations into a single environment. It further supports clinical education through a digital clinical skills logbook, structured assessment tools, and fully digitalised Objective Structured Clinical Examinations (OSCEs). Additional modules include student assistant management, mass mailing, teaching evaluation and quality assurance questionnaires, short formative quizzes, and an AI-assisted tool for generating and refining learning outcomes to ensure alignment with competency-based standards. The system provides separate, role-specific interfaces for students and teachers, optimising usability and access to relevant information. Since its implementation, INP has been adopted across all programmes and is actively used by students and academic staff. Preliminary feedback indicates improved efficiency in course coordination, reduced administrative workload, and greater transparency of academic requirements. Teachers report enhanced monitoring of student progress, particularly in clinical skills acquisition and OSCE readiness, while students benefit from centralised access to syllabi, schedules, evaluation results, and learning resources. Early data also show increased completion rates of teaching evaluations, facilitating more systematic quality assurance and curriculum improvement. The AI-supported learning outcome tool has contributed to more consistent, measurable, and pedagogically sound course documentation. The development of INP demonstrates how a locally designed digital ecosystem can meet the specific needs of a medical faculty while aligning with global trends in digital transformation and outcome-based education. Future directions include integration with hospital information systems, analytics-driven curriculum planning, and expansion of AI-assisted tools for teaching and learning. By presenting this solution, we highlight the potential of institution-specific digital platforms to foster innovation, enhance accountability, and support the next generation of healthcare professionals.

Keywords: Competency-Based Education; Digital Learning Platform; Integrated Information System; Medical Education; Teaching and Learning Innovation

PROBLEM BASED LEARNING

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The McMaster University Faculty of Health Sciences established in late 1960s a new educational approach now known the world around as problem-based learning (PBL). At about the same time, the College of Human Medicine at Michigan State University implemented a problem-solving course. In the early 1970s newly created medical schools in Maastricht (the Netherlands) and in Newcastle (Australia) also developed PBL curricula. PBL is nowadays used in many medical schools worldwide. The main characteristics of PBL are: learning is student-centred, learning occurs in small student groups, teachers are facilitators, problems form the organizing focus and stimulus for learning and are a vehicle for the development of clinical problem-solving skills, new information is acquired through self-directed learning. In PBL students use “triggers” from the problem case or scenario to define their own learning objectives. Subsequently they do independent, self-directed study before returning to the group to discuss and refine their acquired knowledge. Thus, PBL is not about problem solving per se, but rather it uses appropriate problems to increase knowledge and understanding. The process is clearly defined, and the several variations that exist all follow a similar series of steps. Steps in PBL tutorial process are:
1—identify and clarify unfamiliar terms presented in the scenario;
2—define the problem or problems to be discussed;
3— “brainstorming” session to discuss the problem(s), suggesting possible explanations on basis of prior knowledge;
4—review steps 2 and 3 and arrange explanations into tentative solutions;
5—formulate learning objectives;
6—private study (all students gather information related to each learning objective);
7—group shares results of private study (students identify their learning resources and share their results).
Group learning facilitates not only the acquisition of knowledge but also several other desirable attributes, such as communication skills, teamwork, problem solving, independent responsibility for learning, sharing information, and respect for others.
The aim of this presentation is to present theoretical basis of PBL and its use at Faculty of Medicine University of Maribor.

Keywords: Curriculum; Education; Problem Based Learning; Teaching Methods

CLINICAL PEER TEACHING

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Clinical peer teaching is an innovative and increasingly valued aspect of medical education in medical schools. This approach is based on the principle that students, particularly those in higher years of study, can effectively teach and mentor their junior colleagues in a structured clinical setting. This model is widely recognized for its dual benefits: it enhances the learning outcomes of the students being taught while simultaneously developing the teaching and leadership skills of the student tutors. At the Faculty of Medicine in Maribor, peer teaching is commonly utilized in clinical skills training, bedside teaching, and small-group case discussions. It has been developed through elective courses in the third year of medical studies. Junior students benefit from a more approachable and supportive learning environment, as they often feel more comfortable asking questions and clarifying uncertainties with their peers than with senior faculty. Additionally, the use of near-peer tutors helps bridge the gap between theoretical knowledge and clinical application, providing practical insights and advice that are directly relevant to examinations and future practice.

For senior students, engaging in peer teaching strengthens their ability to explain complex concepts, improves their communication and teaching skills, and encourages reflection on their own clinical knowledge. It also fosters professional development by preparing them for future roles as educators and mentors within the healthcare system. Moreover, it facilitates the organization and implementation of national and international meetings on medical education.

Overall, clinical peer teaching contributes to a culture of collaboration, mutual support, and active learning. By promoting both knowledge transfer and professional growth, it enriches the academic environment and plays a vital role in shaping competent and reflective future physicians.

Keywords: Bedside Teaching; Clinical Peer Teaching; Skills Training; Student-Tutor

TEACHING LIKE A CHAMELEON: ADAPTING SEMINARS ACROSS DIVERSE LEARNING CULTURES

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Aim: Periodontology, as one of the specializations within dental medicine, is an integral part of the curriculum in the Dental medicine and Dental hygiene study programs. The curricula include lectures, seminars, preclinical and clinical exercises. Seminar topics are prepared by students working collaboratively in small groups and presented to their fellow students. The aim of this presentation is to compare the implementation of periodontology seminars across several study programs and to highlight observed differences in approach, preparation, and the level of student engagement.
Materials and Methods: The forms and methods of seminar implementation were analyzed in the following programs: Dental Medicine, University of Rijeka (DM); Dental Hygiene, University of Rijeka (DH); Dental Medicine in English, University of Rijeka (DME); Dental Medicine, University of Maribor, Slovenia (DMM). Data were collected based on student presentations and classroom observations. The way of seminar preparation, type of presentation, and level of student involvement in the learning process were compared.
Results: In the DM program, topics are usually thoroughly researched and presented, with students showing a high level of preparedness. In the DH program, performance is considerably poorer — students mostly read prepared texts, showing limited understanding of the presented material. In the DME program, presentations are shorter and more concise, focusing on key aspects of the topic, topic and with enhanced esthetic aspect, but with less analytical depth. An interesting innovation was observed in the DMM program - students introduced interactive methods such as quizzes, video materials and peer surveys. This approach fosters creativity, critical thinking and collaborative learning.
Conclusions: The observed variations in periodontology seminars among study programs may be attributed to several factors: variations in secondary education systems (national frameworks; general secondary school vs. vocational schools), organization of the study programe (full-time vs. part-time) and teaching methods (block or continuous courses; in-person, online, or hybrid formats). The findings indicate the need for standardization of seminar criteria and formats in order to ensure comparable levels of competence and active student participation. Examples of good practice, such as the innovative approaches seen at DMM, could serve as a model for improving education in the field of periodontology.

Keywords: Dental Education; Educational Measurement; Teaching Methods

TRANSFORMATIVE TRENDS IN MEDICAL EDUCATION: INNOVATIONS IN TEACHING CLINICAL OPHTHALMOLOGY

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Advances in artificial intelligence and digital tools are reshaping medical education and creating new opportunities for innovation in clinical teaching. In ophthalmology, taught in the final year of medical studies, students are encountering digital and AI-supported learning for the first time, having previously been educated through traditional, lecture-based methods. Ophthalmology naturally lends itself to such approaches, as it already relies on diverse digital tools for imaging, diagnostics, and visual analysis, which can be easily connected to interactive and technology-enhanced learning. This presentation will showcase practical applications of ChatGPT for generating case scenarios, VisualDx for differential diagnosis, OCT simulations for image interpretation, and AI-based quizzes for formative assessment. The aim is to demonstrate how active learning and thoughtful integration of new technologies can enhance understanding, foster clinical reasoning, and prepare future physicians for practice in the digital era.

Keywords: Artificial Intelligence; Case-Based Learning; Digital Technology; Medical Education; Ophthalmology

AI IN MEDICAL EDUCATION: INTELLIGENCE VS WISDOM

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The rapid integration of artificial intelligence (AI) into medical education is reshaping how future clinicians acquire knowledge, develop skills, and make decisions. While AI systems excel in processing vast datasets, recognizing complex patterns, and providing immediate, evidence-based suggestions, their "intelligence" remains fundamentally different from human clinical wisdom. This abstract explores the evolving relationship between AI-driven competence and the irreplaceable human qualities essential to medical practice. AI enhances learning through adaptive tutoring, simulation, personalized feedback, and objective assessment, offering students unprecedented access to high-quality training environments. It accelerates mastery of diagnostic reasoning, procedural skills, and data-driven decision-making. However, true clinical wisdom—formed through experience, ethical reflection, empathy, cultural sensitivity, and the ability to navigate uncertainty—cannot be automated. The central tension arises when efficiency and accuracy risk overshadowing judgment, compassion, and professional identity formation. Medical education must therefore shift from merely teaching students to *use* intelligent tools toward cultivating the capacity to critically evaluate them. The physician of the future must be able to integrate AI outputs with nuanced understanding of patient values, contextual factors, and long-term consequences. This presentation argues that the goal is not to choose between intelligence and wisdom, but to design curricula where AI strengthens factual learning while educators reinforce humanistic competence. By embracing AI as a partner—not a replacement—we can train clinicians who are technologically proficient, ethically grounded, and wiser in their care for patients.

Keywords: Artificial Intelligence; Clinical Wisdom; Critical Thinking; Medical Education; Moral; Vision

EFFECTIVE TEACHING AND LEARNING STRATEGIES FOR CLINICAL EXELLENCE IN DENTAL STUDENTS

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Aim: The aim of the study was to evaluate the change in self-efficacy in endodontics among dental students during their studies.
Materials and Methods: The Endodontic General Self-Efficacy Scale was used. Data for this longitudinal study were obtained from two generations of students who have completed the same three self-efficacy questionnaires at the end of each academic year over a three-year period.
Results: Repeated measurements of each participant revealed a statistically significant difference in self-efficacy level among the three repeated measures over a three-year period ($F(1, 580) = 80.226$; $p < 0.05$). The effect size between groups showed a statistically significant difference in self-efficacy in performing endodontic treatments across all three repeated measures ($F(1) = 13.958$ $p < 0.05$). The post hoc analysis confirmed the between-group difference (2.838; $p < 0.05$) in the arithmetic mean between the group that had predominantly online education and the group that had predominantly in-person education. Active participation and length of time in a dental office (between several days and one year of experience) were associated with an increase in self-efficacy.
Conclusions: Self-efficacy increased as students progressed in their studies. The self-efficacy of students who were not affected by the lockdown tended to increase; however, in the final year of study, the level of self-efficacy was similar for both groups od students. The social persuasion component could explain the alignment in self-efficacy levels. It means that individuals who receive verbal encouragement affirming their abilities to succeed in specific tasks are more likely to exert increased efforts and maintain persistence.

Keywords: Dental Education; Empathy; Self-efficacy; Teaching

Workshop

TRANSFORMING KNOWLEDGE INTO ACTION: HEALTH LITERACY THROUGH COLLABORATIVE LEARNING

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Transformative learning theory does not address general aspects of learning, but rather learning is understood as the process of using previous interpretations of knowledge to construct new insights that will shape and modify existing understanding by complementing it. The transformation of knowledge into action through collaborative learning is based on idea that: collaborative and reflective learning is key to transforming knowledge into real changes in behavior, habits and professional practice, which is extremely important in health literacy. In the context of medical education, this approach offers a strong theoretical and pedagogical, methodological framework for the development of health literacy that goes beyond the traditional transfer of information or giving / receiving instructions. In methodological practice, we recognize three types of experience that can lead to the process of transformational learning, and these are: experience, critical thinking and rational discussion. Contemporary research emphasizes experience, dialogue and reflection as a catalyst for transformation and indicates that transformative learning has effects on health literacy. Health literacy is raised by transformative learning in levels with greater ease and understanding from the first, functional to the second interactive level to the third level, which is the most complete, and that is the critical level. Collaborative learning allows transformation not to take place in isolation, but in the context of dialogue. Such an environment encourages the exchange of experiences and ideas between students, teachers and practitioners of various disciplines. The basic ones are cooperation and key competencies. The role of collaborative learning is to enable a process where health literacy ceases to be a static ability to transmit information and becomes a dynamic cycle that involves understanding, interpretation, application and joint action. This approach in education encourages the creation of health-conscious individuals and communities who understand and use health information for health promotion, disease prevention, and care and collective long-term well-being. The aim of the workshop is to apply collaborative learning methods in medical education and to enhance the ability to recognize the level of health literacy.

Keywords: Collaborative Learning; Cooperative Behavior; Health Education; Health Literacy; Transformative Learning

Workshop

FOSTERING CRITICAL THINKING IN DENTAL EDUCATION THROUGH CASE-BASED COLLABORATIVE LEARNING: A HANDS-ON WORKSHOP

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The aim of this workshop is to provide participants with practical skills and strategies to foster critical thinking in dental education through case-based collaborative learning (CBCL). Critical thinking enables future practitioners to evaluate evidence, navigate uncertainty, and make safe and informed clinical decisions. Despite its importance, critical thinking is often insufficiently addressed within traditional, lecture-based curricula, where students mainly acquire knowledge passively. To meet the demands of contemporary dental education, it is essential to introduce interactive methods that encourage students to actively analyze, discuss, and reflect on complex clinical problems. CBCL is a pedagogical approach that integrates realistic case scenarios, small-group collaboration, and structured facilitation. It allows students to identify relevant information, explore multiple diagnostic and therapeutic alternatives, justify their clinical choices, and reflect on their reasoning processes. By shifting the focus from passive listening to active engagement, CBCL stimulates higher-order cognitive skills, enhances communication, and promotes teamwork, all of which are critical for effective and interdisciplinary patient care. During this 60-minute workshop, participants will first be introduced to the principles and evidence supporting CBCL in health professions education. They will then work in small groups on a simulated dental case that requires careful analysis and decision-making. Facilitators will guide the process, highlighting practical strategies to engage students, manage group dynamics, and promote reflective thinking. By the end of the workshop, participants will be able to design case scenarios suitable for collaborative learning, apply facilitation techniques to encourage active student participation, and integrate reflective exercises that strengthen critical thinking skills. The workshop will be especially relevant for educators aiming to enrich their teaching practice with interactive, student-centered methods that align with modern educational standards in dentistry.

Keywords: Critical Thinking; Dental Education; Learning; Teaching

COMPARING TRADITIONAL AND MODERN ANATOMY TEACHING MODALITIES: EFFICIENCY IN STUDENT KNOWLEDGE

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Aim: This study aimed to evaluate which learning resources medical students at the University of Maribor use most frequently, how effective they perceive them to be, and how these choices relate to academic performance. The goal was to provide evidence-based guidance for designing anatomy curricula that strategically integrate traditional and modern methods to optimize learning outcomes.
Materials and Methods: This cross-sectional study was carried out across six academic years (2010/2011–2015/2016) and included medical students from the Faculty of Medicine, University of Maribor with a total of 106 participants. Data were collected using a confidential online questionnaire comprising multiple-choice items, Likert scale questions, and optional open-text responses. institutional records were reviewed to systematically document each student's completion of all course requirements.
Results: According to student perceptions, plastic anatomical models had the greatest impact on overall anatomical knowledge, followed closely by donor bodies and dissection. Digital tools, such as the 3D Netter atlas and the Anatomage table, were used less often and perceived as only partially effective. In terms of content retention, students remembered anatomical structures best through practicals involving plastic models and cadaveric specimens, whereas retention was lowest when using digital 3D visualization tools or the Anatomage table. The anatomical atlas emerged as an indispensable reference, widely relied upon by students, highlighting its central role in anatomy education. Nearly 80% of respondents reported that teaching aids alone are insufficient for effective learning, underlining the crucial role of active personal engagement in mastering anatomical concepts.
An analysis of performance on midterm exams, practical assessments, and the final exam reveals generally strong outcomes, with minimal variation in grades across different student cohorts. Almost all students excelled in the practical section of the exam, and the overall outcomes were just as remarkable. Interestingly, some students did not fulfill their obligations on time but still obtained excellent scores at the final exam. The independence of colloquium and final examination grades is also noteworthy. This suggests that while colloquia serve as checkpoints for reinforcing knowledge, they might not reliably success on comprehensive assessments. Numerous students think that personal motivation is essential for success (more important than merely having effective teaching resources) is far more closely linked to persistence and learning improvements than motivation solely based on external factors (grades, etc.).
Conclusion: The study indicates that, while virtual technologies offer promising educational benefits, cadaveric specimens, plastic models, and anatomical atlases, remain essential for learning, knowledge retention, and the development of practical and professional skills.

Keywords: Anatomy; Examination; Medical Education; Teaching Methods

ROUTINE: BUILDING A STANDARDIZED SIMULATION COURSE FOR EMERGENCIES IN OBSTETRICS AND GYNAECOLOGY

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The ROUTINE project (Standardized Simulation Course for Emergencies in Obstetrics and Gynaecology is an international collaboration between the Czech Republic (Masaryk University), Austria (Medical University of Vienna), Germany (Dresden University of Technology) and Slovenia (University Medical Centre Maribor). The project aims to develop, validate and implement a standardized simulation-based training course for managing emergency situations in obstetrics and gynaecology, addressing the gap in available open-access resources of this kind. This initiative responds to the growing need for high-quality simulation education that enhances both technical and non-technical skills, such as communication, teamwork and critical thinking. It is built as an interprofessional course, bringing together doctors (from obstetrics and gynaecology, anesthesiology and neonatology), midwives and nurses. Spanning two days, it combines high-fidelity simulation scenarios with structured debriefings and includes skill stations, with a common goal of improving patient safety and care quality. Through expert consensus and peer review, seven emergency scenarios were developed: Eclampsia, Shoulder Dystocia, Anaphylaxis, Postoperative Dyspnea and Pulmonary Embolism, Postpartum Hemorrhage, Maternal collapse and Acute fetal hypoxia, as well as three skill stations: Difficult airway management, Newborn life support and Breech delivery. With all scenarios, e-learning material was also developed for participants to study before the course. Course effectiveness will be evaluated through a multifaceted approach, with pre- and post-testing. Participants will complete a knowledge test and self-asessment (using the Diagnostic Thinking Inventory (DTI) questionnaire) before the course on day one, and repeat both at the end of the second day, alongside the Simulation Effectiveness Tool – Modified (SET-M). Two simulation sessions will be recorded, one at the start of the first day and one at the end of day two, both being the same scenario but with a different patient. These sessions will be evaluated blindly using an OSCE checklist by trained assessors to ensure objectivity. A pilot course conducted in October in Brno (Czech Republic) will be followed by localized implementations in Vienna, Dresden and Maribor. Based on the results, a validated standardized simulation-based course will be freely disseminated and made available for adaptation elsewhere. The lecture aims to present an approach for creating a standardized simulation-based course while emphasizing the importance of developing open-access material for a broader use.

Keywords: Interprofessional Education; Gynecology; Medical Education; Obstetrics; Program Evaluation; Simulation Training

LEARNING THROUGH EXPERIENCE: THE INFLUENCE OF SIMULATED MASS CASUALTY AND EMERGENCY SITUATIONS ON STUDENT KNOWLEDGE ACQUISITION

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Simulation-based learning is an essential component of medical education, particularly for preparing students for unpredictable, high-pressure emergencies. This abstract aims to present the educational approach and experiential learning opportunities offered by the Urgentni vikend (Emergency Weekend), highlighting how simulated emergency and mass casualty scenarios support knowledge acquisition, practical skills, organizational understanding, and teamwork development among medical and healthcare students in the program, organized by the Student Emergency Section (Študentska urgentna sekcija) at the Medical Faculty, University of Maribor. The project presents an innovative model integrating theoretical learning with experiential, simulation-based training through lectures, workshops, and progressively complex exercises that enhance both knowledge and practical response skills. Participants first engage in smaller, scenario-based clinical simulations that connect theoretical knowledge with field management. Working in rotating teams, students address diverse emergency situations and perform procedures ranging from basic immobilization to advanced resuscitation. These controlled environments foster teamwork, effective communication, and calm decision-making under pressure, providing essential preparation for the large-scale simulations that follow. The educational progression culminates in two comprehensive mass casualty simulations replicating the complexity of real disasters. The first occurs without prior notice, exposing students to chaos, limited information, and the emotional intensity characteristic of real emergencies. Teams must quickly organize, establish triage zones, and allocate limited resources efficiently. This phase tests adaptability, leadership, and spontaneous coordination. The second, preplanned simulation allows structured preparation, during which students familiarize themselves with command hierarchies, define roles, and coordinate patient transport in collaboration with police, firefighters, and military personnel. Observations from mentors and MRMI instructors demonstrated clear improvement between the two simulations, with notable progress in leadership, communication, triage management, logistics, and situational awareness. Urgentni vikend illustrates how immersive simulation bridges theory and practice, transforming students from observers into competent responders. By experiencing both unannounced and preplanned mass casualty scenarios, participants gain not only clinical and organizational competence but also adaptability, teamwork, and leadership, which are vital for effective performance in real-world emergency environments.

Keywords: Emergency Medicine; Experiential Learning; Mass Casualty Incidents; Medical Students; Simulation Training

FROM SIMULATOR TO REALITY – DEVELOPING LIFE SKILLS IN EMERGENCY MEDICINE

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In emergency medicine, every decision can make the difference between life and death. It sounds like a cliché – until it's not. We are aware of the risks of our profession, yet sometimes unaware of the gaps in our knowledge and its application. Technical proficiency alone is not enough. True professional success and patient safety depend on a wide range of "skills for life" – communication, teamwork, emotional resilience, and the ability to make sound decisions under pressure. Simulation-based training, when properly designed, provides an ideal environment to develop these essential competencies. The aim of this presentation is to highlight how simulation-based education can be transformed into real-world safe practice by developing not only clinical but also interpersonal and emotional competencies essential for emergency medical professionals. Through realistic scenarios, healthcare professionals not only practice clinical procedures but also refine interpersonal communication, recognize stress responses, strengthen leadership, and learn through reflection and feedback. However, the real challenge begins once training moves from the simulator to real-life settings, where unpredictability, fatigue, and emotional load test both knowledge and character. Despite the proven educational value of simulation, gaps remain in translating acquired competencies into everyday practice. Insufficient mentoring, lack of systematic follow-up, and limited institutional support often weaken the long-term impact of training. To transform education into safe and sustainable practice, an integrated model is required – one that connects simulation, mentorship, reflection, and application. This approach fosters professional identity, reduces the risk of burnout and error, and cultivates competencies that extend far beyond the clinical field – true skills for life. Simulation, therefore, should not be viewed merely as a learning tool, but as a transformative process shaping confident, self-aware, and resilient healthcare professionals – ready for the realities of modern emergency medicine.

Keywords: Clinical Competence; Emergency Medical Services; Leadership; Patient Safety; Simulation Training

EXTRACURRICULAR SIMULATION-BASED LEARNING IN CLINICAL PEER TEACHING

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Clinicians recognise that medical students require time to acquire skills and practise them safely before they encounter real patients, yet ward pressure and limited faculty time make this challenging. Extracurricular simulation—after-hours, voluntary sessions run by senior students for juniors with faculty oversight—offers a practical solution. This review summarises what works and proposes a simple model that a medical school or clinic can adopt with modest resources. The review aims to describe the educational value, basic organisation, and quality safeguards of student-led simulation within clinical peer teaching, and to suggest clear measures of impact. Typical sessions focus on common internal-medicine tasks (venepuncture, arterial sampling, catheterisation, ECG placement, and bedside ultrasound basics), acute scenarios (deteriorating patient, sepsis bundle, and chest pain), and core behaviours (handover, escalation of concern, and teamwork). Published reports consistently demonstrate better completion of procedural steps and improved OSCE performance, accompanied by higher confidence and earlier help-seeking. Effects on real-world patient outcomes still require stronger evidence. The review outlines a five-part plan for implementaion: (1) Access and equity—open lab hours, simple booking, and a small library of trainers; (2) Curriculum—clear skills aligned to Entrustable Professional Activities and ward needs; (3) Tutor development—brief train-the-trainer workshops, standard teaching scripts, and periodic calibration; (4) Assessment—short pre/post checks, linkage to workplace-based assessments, and basic learning analytics; (5) Governance—named consultant oversight, risk management, and concise documentation. Practical tips include using affordable models, scheduling sessions during low-demand periods, offering micro-credentials for tutors, and incorporating short debriefs with a clinician. Common pitfalls are tutor “drift,” variable standards, sustainability, and inclusion; these can be contained with checklists, small group sizes, regular calibration, and formal recognition for tutors. In summary, structured extracurricular simulation can extend limited faculty capacity, safely accelerate skill acquisition, and prepare students for the wards more effectively.

Keywords: Clinical Competence; Medical Students; Patient Safety; Peer Teaching; Simulation Training; Undergraduate Medical Education

Workshop

PAME – ULTRASOUND AS A BRIDGE BETWEEN ANATOMY AND CLINICAL PRACTICE

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PAME (POCUS assisted medical education) is an interactive workshop, aimed at improving undergraduate medical education by using point-of-care ultrasound (POCUS) as a teaching tool for anatomy, physiology, and clinical reasoning. The project started in 2016 with the handbook PACE (POCUS Assisted Clinical Examination) and its first workshop at the 12th WINFOCUS world congress on ultrasound in emergency and critical care in Ljubljana, Slovenia. From this foundation, PAME was designed as a three-level model: 1. Fundamentals (1st–2nd year: anatomy and physiology with ultrasound), 2. Clinical Examination (3rd–4th year: propedeutics and differential diagnosis), 3. Clinical Integration (5th–6th year: patient management, especially in emergency medicine). Workshops are highly interactive: in PAME Anatomy – Abdomen, students explore the anterior abdominal wall, diaphragm, liver, gallbladder, kidneys, spleen, aorta, urinary bladder and pelvic spaces, linking classical anatomy with ultrasound findings. In PAME Anatomy – Heart, students learn cardiac chambers, valves, coronary vessels, pericardium, conduction system, and the dynamics of contraction, relating anatomical structures to ultrasound windows and functional assessment. The sessions are organized in collaboration with Ultrafest Maribor, a student-led project of the Medical Students' Association of Maribor, which promotes ultrasound literacy through annual educational events. PAME has been successfully integrated into the official curriculum at the University of Maribor. Ultrasound is now included in core courses (Anatomy with Histology and Embryology; Physiology) and elective courses (Propedeutics, Endoscopic and Ultrasound Simulations). Students report improved understanding of anatomy and physiology, greater engagement, and a better link between theoretical knowledge and clinical reasoning. PAME demonstrates that ultrasound is not only a diagnostic tool but also an effective educational instrument. By combining practical ultrasound anatomy with clinical integration, it bridges basic sciences and clinical medicine, providing an innovative model of modern medical education.

Keywords: Anatomy; Curriculum; Education, Medical; Point-of-Care Systems; Ultrasound

Workshop

DESIGNING HIGH-IMPACT SIMULATION SCENARIOS FOR CLINICAL TEACHING

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Simulation-based education is now an essential method in clinical teaching, yet scenario design, as one of the foundations, is often underestimated or approached with limited structure. This workshop targets educators who already include simulation in their teaching and want to enhance their ability to create useful, goal-oriented and engaging clinical scenarios. The aim of the session is to introduce participants to core theoretical principles that underpin the development of high-quality simulation cases, regardless of the modality or technological complexity used. An effective simulation scenario begins with the identification of specific, measurable learning objectives. These objectives should reflect the learners' level of training, expected competencies, and the intended focus of the session regardless if it is clinical reasoning, procedural skills, teamwork, or communication. Once objectives are defined, the scenario framework can be developed to support them. A well-designed case balances realism and educational focus: the clinical narrative should be believable and aligned with real-life situations, yet streamlined to avoid unnecessary complexity or distraction. Matching scenario difficulty and fidelity to the learner cohort is essential for maintaining engagement and supporting skill development without introducing excessive cognitive load. Designing appropriate decision points and potential learner actions requires a clear understanding of common decisions-making steps in clinical reasoning and opportunities for discussion or correction. It is equally important to ensure psychological safety within the scenario structure, allowing learners to feel comfortable making decisions, asking questions, and reflecting on their performance. Finally, good scenarios are structured but flexible. They allow for variation in learner response while keeping the session anchored to its key goals. By focusing on learning rather than performance, simulation scenarios become powerful tools for bridging knowledge, skills, and behavior in medical education.

Keywords: Clinical Teaching; Medical Education; Scenario Design; Simulation-Based Education

Session C10. FLIPPED CLASSROOM AS A NEW TEACHING STANDARD IN MEDICAL EDUCATION

"FLIPPING" THE ELECTIVE COURSES: INNOVATIVE CURRICULUM APPROACH WHEN TIME IS LIMITED

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The aim of this presentation is to examine the implementation of the flipped classroom model in elective courses, with particular attention to curriculum design when contact time is limited. Although most often applied in clinical education, the flipped classroom also holds considerable promise in elective biomedical courses by enhancing learning efficiency, motivation, and long-term knowledge retention. The elective course Epigenetics in Health and Disease, delivered within the University integrated undergraduate and graduate study Medicine at the University of Rijeka, was organized entirely according to flipped classroom principles. Students studied interactive online materials in advance, while on site sessions focused on active learning through journal club seminars, discussion, and problem-solving. This approach replaced traditional lectures with student-centred activities that fostered deeper understanding and critical engagement with complex content. Key benefits included greater autonomy, active participation, and more effective integration of theory into biomedical contexts, even under time constraints. Challenges such as time management and the abstractness of concepts highlighted the importance of careful instructional design and high-quality preparatory materials. Overall, this experience illustrates that flipping elective courses is both feasible and effective, offering a valuable innovation for modernizing medical curricula and better preparing students for advanced study and clinical practice.

Keywords: Epigenetics; Medical Education; Problem-Based Learning; Teaching

INNOVATIVE TEACHING IN MEDICINE: WHEN ARTIFICIAL INTELLIGENCE MEETS THE FLIPPED CLASSROOM

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The flipped classroom (FC) is one of the most innovative pedagogical models in higher education, especially in medicine where students face demanding workloads and outcomes requiring both deep understanding and practical application. In contrast to the traditional lecture-based model, the FC approach shifts the acquisition of new knowledge to the asynchronous phase, outside the classroom, through video lectures, podcasts, quizzes, and problem-based assignments. Classroom time is then reserved for active learning, collaboration, problem-solving, and applying theoretical concepts to clinical cases. Numerous studies, including feedback from medical students themselves, indicate that FC is more effective than traditional approaches in preparing for final examinations, as it fosters better comprehension, self-directed learning, and long-term retention. Still, many teachers resist this approach. FC requires a radical shift in mindset, as the teacher's role evolves into facilitator and mentor. Some feel uncomfortable in this position, and many lack training in learning design and flipped strategies. Implementation demands substantial time: setting clear learning outcomes, preparing quizzes, podcasts, videos, and problem-based tasks. For already overburdened faculty, these additional duties create stress. Producing quality materials also requires technical skills and equipment that are not always available. The model further relies on student responsibility. If students do not prepare at home by engaging with the materials, classroom activities lose effectiveness. Some students initially resist collaborative work, finding the approach demanding. Thus, barriers include heavy initial workload, lack of support and training, technical challenges, and concerns about student preparedness. Artificial intelligence (AI) can address many of these obstacles. Acting as a teaching assistant, AI reduces preparation time by supporting the creation of precise learning outcomes, generating quizzes, drafting podcast and video scripts, and proposing problem-based assignments. By lowering the administrative burden, AI improves teacher well-being and making them more open to pedagogical innovation. AI tools can also suggest ideas for in-class activities, supporting teachers in adapting to the facilitator role while simultaneously enriching interaction. When combined, FC and AI create a powerful synergy: FC maximizes active learning and knowledge application, while AI minimizes barriers to its implementation. Together, they form a pathway towards more engaging, efficient and sustainable medical education, aligned with the expectations of modern students and the future of healthcare.

Keywords: Active Learning; Artificial Intelligence; Flipped Classroom; Medical Education; Self-Directed Learning

Workshop

FLIPPED CLASSROOM: FROM IDEA TO IMPLEMENTATION WITH THE SUPPORT OF AN ARTIFICIAL INTELLIGENCE ASSISTANT

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The flipped classroom (FC) approach is one of the most innovative pedagogical models in higher education, reshaping the classical model of teaching and learning. Unlike classical approaches that rely primarily on the passive transfer of knowledge, the FC approach emphasizes active knowledge construction. At its core, the FC approach organizes the learning process into two complementary phases: the asynchronous phase, where students acquire fundamental concepts before class through digital resources such as video lectures, podcasts, or quizzes; and the synchronous phase, where class time is dedicated to active learning, collaboration, discussion and problem-solving. This interactive workshop is designed to guide participants through the essentials of the FC model, demonstrating how different teaching and learning activities (TLA) can be effectively distributed between two phases of the FC approach. Its success depends on carefully selecting and designing TLA that align with learning outcomes (LO) and foster students to arrive to class well-prepared and ready to engage. To support this process, participants will be introduced to the Balanced Design Planning (BDP) tool. BDP provides a practical framework for aligning TLA with LO while also estimating student workload, thus enabling a balanced and purposeful course design. However, despite the proven effectiveness of the FC approach, many teachers remain hesitant to adopt it. One of the main barriers lies in the time and effort required to produce high-quality materials, which can discourage even those who recognize its pedagogical value. This workshop addresses these challenges by offering practical solutions. The central part of the workshop will focus on demonstrating how the artificial intelligence (AI), can enhance and streamline both preparation and active learning. Through practical demonstrations using an AI assistant, participants will learn how AI can be applied to generate LO, design self-assessment quizzes, produce scripts for video lectures and podcasts and develop clinical case scenarios. By integrating AI into their practice, teachers can significantly reduce preparation time while improving the quality, interactivity, and creativity of their teaching materials. Conducted in an interactive format, the workshop will provide participants with the opportunity to apply both the FC framework and AI-supported tools directly to their own subjects. Those wishing to engage actively in the practical component are encouraged to bring a laptop and a PDF document (such as a textbook chapter relevant to the topic they teach). This will enable them to experiment with both the BDP framework and AI-supported tools directly on their own teaching materials, bridging the gap between theory and practice - and moving from idea to implementation.

Keywords: Artificial Intelligence; Flipped Classroom; Learning Design; Medical Education; Teaching and Learning Activities

Session C11. KEYNOTE TRANSFORMATIVE SESSION - IS THERE A FUTURE FOR MEDICAL TEACHERS? ARTIFICIAL VS. HUMAN INTELLIGENCE

AI AND THE MEDICINE AT THE END OF THE WORLD

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This analysis posits that the development of Artificial Intelligence over the 2025–2035 decade represents not an eschatological event, but a possibility of a profound structural transformation of work, knowledge, and power. The outcomes of this transformation are not predetermined; they are contingent upon three decisive factors: 1) the control and distribution of computational resources (compute), 2) the nature of governance and regulation, and 3) the mechanisms for benefit-sharing. We articulate four primary scenarios for this near-future: Techno-Feudalism (rapid, centralized, opaque), the Leviathan State (centralized, cautious, bureaucratic), Distributed Chaos (proliferated, unsafe, uncoordinated), and the Federation of Models (distributed, responsible, interoperable). The implications of these trajectories are particularly acute in high-impact sectors such as medicine. It explores how dystopian pathways—Techno-Feudalism or Distributed Chaos—could leverage AI for coercive ends. In these scenarios, powerful AI-driven tools like gene resequencing or advanced neural chip implants risk becoming instruments of profound inequality. They could create a new 'bio-tech divide' based on privileged access, or, if unregulated, lead to catastrophic 'bio-hacking' incidents and the exploitation of the most sensitive personal data. To counteract these risks, the paper argues that the "Human-in-the-Loop" (HIL) principle must be codified as a permanent, non-negotiable component for accountability in all critical sectors, especially in clinical decision-making. We conclude that avoiding technological dependency and ensuring equitable, human-centric outcomes requires immediate, concrete policy levers and significant investment in both hardware as well as in (open-source) gen AI. These must include robust public investment in 'compute commons' to democratize access, mandated interoperability standards to prevent vendor lock-in, and directing education towards critical thinking and verification, (AI) ethics in addition to knowledge adoption.

Keywords: Bio-Tech Divide; Computational Resources; Education; Open-Source AI

THE USE OF ADVANCED CONVERSATIONAL AGENTS BASED ON ARTIFICIAL INTELLIGENCE TECHNOLOGIES – TECHNOLOGICAL, ETHICAL, AND LEGAL IMPLICATIONS

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The rapid advancement of artificial intelligence technologies in conversational AI agents and assistants presents significant opportunities for broader application across public institutions, the economy, and education. However, experience from the EDIH ADRIA project, along with numerous recent research findings, reveals substantial challenges that warrant careful consideration. A critical question emerges: where is the boundary between general information that an AI agent can appropriately provide and domains that require professional expertise? Consider the difference in consequences: selecting the wrong option when configuring a new car may result only in financial loss, but providing incorrect medical advice or recommending an inappropriate remedy can have serious health consequences. This raises fundamental questions about our readiness—particularly from legal and ethical perspectives—for a world that will undergo radical transformation in the coming years. As these technologies continue to evolve at an unprecedented pace, we must address these challenges proactively to ensure responsible implementation.

Keywords: Artificial Intelligence; Conversational AI Agents; Ethics; Legal Implications

FUTURE OF EDUCATION: A SYMBIOTIC RELATIONSHIP BETWEEN MACHINES AND HUMAN INTELLIGENCE

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Aim of this lecture is to emphasize the symbiosis between machine learning tools and human interaction. Is the future of education the replacement of human teachers by Machine Learning (ML) algorithms? The learning process is transforming over time, but the change is a natural process specific to human development. If the personalization is the aim of the learning process, ML algorithms can be used to analyze students performance data and develop customized learning plans. These plans can be dynamically adapted to each student individual needs by recommending targeted resources, adjusting difficulty levels, and suggesting formative assessments, thereby enabling more effective, continuous improvement. Students struggling with a complex topic can get access to additional resources and interactive exercises, while more advanced students can be challenged with more complex tasks. In this approach, *ex chathedra* lectures are minimized and teachers role is shifts toward mentoring, coaching and curating. As ML will probably take over routine tasks like grading tests and tracking students progress, teachers can focus on uniquely human skills such as critical thinking, creativity, emotional intelligence and collaboration. This fusion of technology and teaching helps overcome geographical barriers and offering high-quality medical education to people worldwide. ML tools can provide immediate feedback on technical skills, such as interpreting lab results or identifying anatomical structures. However, technology alone cannot replace the skills needed for patient interaction, which are essential in medical professions. The "more than 90% nonverbal communication" concept, while often oversimplified, highlights the critical importance of a physician's ability to read and respond to a patient's nonverbal cues, which sometimes requires direct, human-to-human interaction. Finally, it is necessary to address ethical questions, such as data protection, especially patient data protection and privacy. Maintaining a balance between digital learning and the personal contact that is crucial for students social and emotional development. The goal is to use ML to enhance the learning process, not to automate the human-centered aspects of medicine.

Keywords: Education Machine Learning; Medicine Students; Teachers

ARTIFICIAL INTELLIGENCE IN MEDICINE AND EDUCATION: ACHIEVEMENTS, OPPORTUNITIES, CHALLENGES, AND THE ROAD AHEAD

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Artificial intelligence (AI) has rapidly evolved from a niche technological field into one of the most transformative forces across science, healthcare, and education. From early rule-based expert systems to today's large-scale neural networks, AI has consistently expanded its scope, accuracy, and usability. In recent years, the emergence of generative AI has marked a paradigm shift: these systems are multimodal, capable of processing and generating text, images, speech, and even molecular structures. Their flexibility makes them powerful tools not only for clinical applications but also for reshaping the way we teach and learn. A central element of this transformation is the rise of large language models (LLMs). LLMs can synthesize information from vast corpora, engage in human-like dialogue, and adapt to diverse tasks with minimal prompting. In education, they support adaptive learning environments, intelligent tutoring, and the automation of assessment and feedback. In medicine, LLMs contribute to literature synthesis, decision support, patient communication, and the streamlining of clinical documentation. Beyond these direct uses, AI increasingly accelerates research and discovery, from analyzing genomic data to simulating complex biological processes. Perhaps the most profound promise of AI lies in its role in personalized and precision medicine. By integrating multimodal patient data — genetic, imaging, behavioral, and environmental — AI enables more precise diagnostics, risk prediction, and tailored therapeutic strategies. This has the potential to fundamentally redefine the relationship between patients, clinicians, and medical knowledge. However, such progress also raises significant challenges. The opacity of deep learning models highlights the urgent need for explainable AI, especially in high-stakes domains like healthcare. Ethical issues are equally pressing: bias in training data, inequities in access, data privacy, and accountability for errors. These risks underscore the importance of critical oversight, interdisciplinary collaboration, and robust regulatory frameworks. Looking toward the road ahead, consensus is emerging around both the opportunities and the uncertainties of AI's trajectory. The prospect of artificial general intelligence (AGI) and, eventually, artificial superintelligence (ASI) invites deep reflection on their implications for medicine and education. While AGI could accelerate scientific discovery and universalize access to knowledge, it also challenges our ethical, legal, and societal frameworks at a fundamental level. For educators and healthcare professionals alike, this future requires not only technological preparedness but also a renewed commitment to human values, empathy, and responsibility.

Keywords: Artificial Intelligence; Teaching; Medical Informatics

EMPOWERING STUDENT LEARNING IN CLINICAL SETTINGS THROUGH ARTIFICIAL INTELLIGENCE

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Aim of this presentation is to explore how artificial intelligence can enhance student learning in clinical settings by providing personalized support, real-time feedback, and innovative educational tools. The rapid integration of artificial intelligence (AI) into healthcare is transforming not only clinical practice but also the way future healthcare professionals learn and develop their competencies. This lecture explores how AI-driven tools can enhance medical education within clinical environments by providing personalized learning experiences, real-time decision support, and data-driven feedback. Through practical examples and case studies, we will demonstrate how AI applications — from virtual patients and intelligent tutoring systems to diagnostic support platforms — can augment traditional bedside teaching and bridge the gap between theory and practice. The session also addresses key challenges such as ethical considerations, data privacy, and the need for critical thinking skills in an AI-enhanced curriculum. Ultimately, participants will gain insights into how AI can empower students to become more engaged, reflective, and adaptive clinicians in a rapidly evolving healthcare landscape.

Keywords: Artificial Intelligence; Clinical Learning; Medical Education; Personalized Feedback

ARTIFICIAL INTELLIGENCE IN GASTROENTEROLOGY: CURRENT LANDSCAPE AND FUTURE FRONTIERS

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Artificial intelligence (AI) is redefining gastroenterology, with the most profound impact seen in endoscopy**.** Deep learning–based systems now enable real-time polyp detection, lesion characterization**,** and automated quality assessment**,** markedly improving adenoma detection rates and diagnostic consistency. Beyond endoscopy, AI supports histopathology, radiology, and predictive modeling for complex liver and bowel diseases. Integration of multimodal data is advancing precision gastroenterology, while challenges in data standardization, interpretability, and regulation persist. The future points toward AI-augmented therapeutic endoscopy and predictive digital twins**,** positioning AI as an indispensable collaborator in delivering safer, more precise, and data-driven gastrointestinal care.

Keywords: AI; Endoscopy; Gastroenterology

Workshop

LARGE LANGUAGE MODELS IN ACADEMIC WORK AND MEDICAL EDUCATION

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Large Language Models (LLMs)—the core technology behind AI-powered chatbots such as ChatGPT, Claude, and Gemini—are rapidly reshaping how medical researchers and educators search for, interpret, and communicate scientific information. The aim of this workshop is to introduce beginners to the practical, responsible, and hands-on use of freely available LLM platforms in medical research and teaching. Participants are encouraged to bring their own laptops, tablets, or phones and, if they wish, to create accounts on one or more chat-based LLM platforms before the session; this is not mandatory but will allow full participation in live exercises. Designed for those with no prior experience, the 60-minute workshop emphasizes demonstration, exploration, and critical discussion. The session begins with a brief introduction to the principles of data privacy and confidentiality in the use of online AI tools—an essential prerequisite for safe application in medical and academic contexts. Building on this foundation, participants will then explore (1) how LLMs can assist with literature searching by helping to formulate structured queries; (2) how LLMs can summarize and critically review scientific papers; (3) how LLMs can streamline planning and administrative tasks in medical education; and (4) how LLMs can be used from a learner's perspective as Socratic learning partners. Each segment includes live demonstrations using free LLM chat engines, with opportunities for participants to follow along and experiment in real time. The workshop underscores both the benefits and limitations of LLMs, emphasizing data privacy, bias awareness, and critical engagement. By its end, participants will have gained practical confidence in integrating LLMs into their academic work while maintaining ethical and professional standards.

Keywords: Artificial Intelligence; Medical Education; Natural Language Processing; Research; Review Literature as Topic; Teaching

Workshop

GENERATIVE AI TOOLS IN MEDICAL EDUCATION

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Workshop participants will be introduced to the basic concepts of generative artificial intelligence tools and their application in medical education. The focus will be on specific tools that use generative artificial intelligence for content creation, clinical scenario simulation, and personalised learning. The workshop will examine how AI tools can support the development of clinical thinking and communication skills. Practical examples will be presented, and ethical challenges—including information accuracy, data privacy, and academic integrity—will be discussed. Participants will have the opportunity to engage actively with the tools through practical tasks. Special emphasis will be placed on the role of teachers in shaping the responsible and effective use of artificial intelligence technology. The workshop is intended for teachers, educators, and experts in medical education. The goal is to empower participants to use GenAI tools to improve the quality and accessibility of education.

Keywords: AI tools; Generative Artificial Intelligence; Medical Education; Teaching

Session C12. KEYNOTE TRANSFORMATIVE SESSION - FACULTY DEVELOPMENT AS A MAJOR TRANSFORMATIVE POWER

THE IMPORTANCE OF TEACHER EDUCATION: EMPOWERING INDIVIDUAL GROWTH TO DRIVE INSTITUTIONAL EXCELLENCE

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Faculty development (FD) is central to advancing medical education, as empowering educators strengthens individual competence in the short term and drives institutional performance and transformation in the long term. This presentation traces the evolution of the Centre for Improving Teacher Competencies and Communication Skills (Centre for Medical Education, CME) at the Faculty of Medicine in Rijeka, highlighting how investing in teacher professional development promotes broader institutional excellence. Since its establishment in 2017, the CME—serving as a central educational FD unit—has implemented a wide range of initiatives, including educational programmes, scientific and professional meetings, research projects, publishing activities, and peer review in teaching. These efforts have enhanced educators' pedagogical skills, confidence, and professional identity, fostering a culture of reflective, learner-centred teaching. Over time, the impact has extended beyond individual teachers, contributing to course reforms, improved student engagement, more effective assessment practices, and the development of educational projects through personalised collaborations between the CME and individual departments. Key enablers of success include leadership support, dedicated resources, and collaborative communities of practice. The CME's experience demonstrates that even smaller faculties can achieve significant institutional impact through focused, centralised, and strategic FD. By positioning teacher education as an institutional priority, individual growth becomes a catalyst for system-wide improvements in educational quality, academic culture, and performance. Lessons learned underscore the importance of aligning FD initiatives with institutional strategy, recognising and rewarding educational roles, and building sustainable structures for continuous improvement. This narrative provides practical insights for medical faculties seeking to leverage teacher education as a key driver of institutional excellence.

Keywords: Faculty Development; Healthcare Professions; Medical Education; Medical Teacher; Professional Development

THE POWER OF PEER REVIEW IN TEACHING: SHAPING THE FUTURE OF PERSONALIZED TEACHER TRAINING

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This presentation aims to explore how the power of peer review can be utilized to transform teacher training in medical education through personalized, reflective, and collaborative approaches. The rapidly evolving field of medical education demands innovative and adaptive professional development that meets the diverse needs of educators and students. Traditionally linked to research, peer review is presented here as a powerful mechanism for enhancing teaching practices. It fosters continuous reflection, personalized development, and collective growth among educators. Since medical teaching requires constant adaptation and self-reflection, peer review offers a structured framework for constructive feedback, refinement of teaching techniques, and professional growth. Beyond evaluation, it builds mutual support, encourages dialogue, and empowers educators to take a more responsible approach to their learning. Through peer-driven feedback, strengths and areas for improvement are identified, leading to more effective and tailored teaching strategies. Its benefits—enhanced reflective practice, innovation in teaching, and collaboration—will be discussed, alongside challenges such as bias, time constraints, and the need for reviewer training. Practical strategies to overcome these barriers will be proposed. A key focus is on how peer review personalizes teacher training. Unlike traditional “one-size-fits-all” approaches, peer review offers individualized feedback tailored to each educator’s style and goals. This promotes customized learning pathways and sustainable professional growth. The examples of successful integration of peer review in medical education, showing improvements in teaching effectiveness, leadership, and accountability, will be presented. The discussion will also highlight how peer review aligns institutional priorities with personal aspirations, enhancing learning outcomes and student satisfaction. Finally, strategies for implementing peer review frameworks will be outlined, including digital tools, reviewer preparation, and fostering a culture of open communication. Embedding peer review as a core element of faculty development can cultivate a dynamic community of continuous improvement. In conclusion, integrating peer-driven feedback into professional development promotes a culture of excellence, collaboration, and innovation—ultimately enhancing the quality of education for both teachers and students.

Keywords: Educational Innovation; Medical Education; Peer Review; Personalized Development; Professional Growth; Teacher Training

MENTAL REHERSAL IN SURGICAL EDUCATION: ENHANCING LAPAROSCOPIC TRAINING THROUGH VISUALISATION

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Aim: Visualisation is a cognitive technique that involves mentally rehearsing a task or skill, without physical movement. This study aimed to evaluate the effectiveness of visualisation as a training tool in laparoscopic simulator exercise and compare it to traditional repeated physical practice.
Materials and methods: Fifty medical students with no laparoscopic experience, were randomly assigned into two groups. Group 1, "laparoscopic group" (n=25) performed a validated hand-eye coordination laparoscopic exercise using GESEA LASTT model seven times in succession, each lasting two minutes, aiming to place up to 12 colored rings to metal nails. Group 2, "visualization group" (n=25) performed the exercise physically on attempts 1, 4, and 7, while attempts 2, 3, 5, and 6 were completed using visualisation only. Each attempt was limited to 2 minutes. Scoring was performed based on the number of placed rings (range 0-12 points). Performance of both groups was compared. Statistical analysis was performed using SPSS software (version 25). Friedman test and Mann-Whitney test were used to compare data within and between groups. A p-value of < 0.05 was considered statistically significant.
Results: Mean scores in the laparoscopic group increased from 2.92±2.14 (1st attempt) to 6.52±3.26 (4th attempt) and 8.24±2.86 (7th attempt). In the visualisation group, scores rose from 2.88±1.72 (1st attempt) to 5.76±2.57 (4th attempt) and 7.44±2.99 (7th attempt). Within-group analysis revealed a statistically significant improvement in performance across the 1st, 4th, and 7th attempts for both the laparoscopic ($p < 0.01$) and the visualisation group ($p < 0.01$), indicating effective skill acquisition in both training approaches. The visualisation group demonstrated performance outcomes comparable to the repeated physical practice group, with no significant difference in the number of pins placed on the 4th and final (7th) attempts ($p = 0.39$). Compared to only the first three repetitions in laparoscopic group (mean scores: 2.92±2.14, 4.96±2.53, and 5.52±2.82, respectively), the visualisation group performed significantly better ($p < 0.05$), suggesting a measurable benefit of mental rehearsal between physical attempts.
Conclusions: Visualisation is an effzctive complement to physical practice in laparoscopic training. It enables comparable skill acquisition to repeated hands-on training and offers significant advantages over limited physical repetition alone. These findings suggest that the integration of structured visualisation techniques into surgical education curricula might be a time-efficient and resource-conscious approach for developing laparoscopic skills.

Keywords: Laparoscopy; Pelvic Trainer; Surgical Training; Visualisation

ENHANCING TEACHING EXCELLENCE IN INTERNAL MEDICINE EDUCATION: EXPERIENCES AND CHALLENGES

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The Department of Internal Medicine at the University of Zagreb School of Medicine is continuously engaged in improving the quality and effectiveness of undergraduate teaching. Through systematic reflection and feedback, several key challenges have been identified: double loyalty of faculty members who are simultaneously clinicians and educators, lack of protected teaching time, limited physical space due to ongoing building reconstruction in Zagreb, large student cohorts, insufficient formal training in medical education, inconsistencies in assessment practices, and imprecisely defined learning outcomes. In response, a comprehensive set of measures has been introduced. These include continuous student evaluation of teaching performance with transparent reporting of results, regular departmental meetings to identify teaching gaps, and faculty development initiatives focused on assessment design. A USMLE-style written exam based on clinical vignettes was implemented, following structured training in question writing and continuous psychometric analysis. To support this shift, case-based learning was introduced across the curriculum, ensuring alignment between teaching methods, assessment, and clinical reasoning development. Additional reforms comprise formative ECG quizzes as prerequisites for final exams and numerous self-assessment quizzes available through the learning management system. These interventions have led to a steady improvement in student satisfaction with internal medicine teaching and a stronger alignment between learning outcomes, assessment, and teaching practice. The Department remains committed to fostering a culture of reflective practice, data-informed decision-making, and continuous professional development in medical education.

Keywords: Case-Based Learning; Faculty Development; Internal Medicine; Program Evaluation; Teaching

DEVELOPMENT OF THE EDUCATIONAL PROCESS IN PUBLIC HEALTH OVER TIME – EXPERIENCES FROM THE MEDICAL FACULTY, UNIVERSITY OF MARIBOR - CASE REPORT

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Aim: The main challenge in establishing and developing the pedagogical process of teaching Public health at the Medical Faculty of the University of Maribor was the recognition that public health is not a traditional, clinically oriented discipline focused on the individual. Students were not accustomed to "thinking" in public health terms. Our goal was that, upon completion, students would understand the essence and importance of public health, both for society as a whole and for their future professional practice. This required an "out-of-the-box" perspective and the use of clear, engaging, and innovative approaches.
Case Report: For teachers, challenges in implementing seminars included organizational issues (scheduling within an already busy curriculum dominated by clinically oriented subjects), the selection of content (presenting the wide scope of public health within a limited timeframe while ensuring comprehension), and the delivery (interactive approaches, practical relevance, and ensuring active participation despite large groups). For students, challenges involved recognizing the relevance of public health, adopting its methods, perspective, developing critical thinking, preparing concise presentations for peers, and leading discussions—activities that strengthened not only their knowledge but also communication skills and assertiveness. In practical exercises, teachers faced additional challenges: ensuring equal inclusion of all students, motivating active participation, emphasizing public health reasoning rather than clinical detail, and maintaining variety and dynamism (e.g., alternating between lecturer and student engagement, introducing short active breaks). Regular annual updates of content were necessary, given the emergence of new public health issues.
Conclusions: Our experience shows that each new generation of medical students arrives more informed (through digital media), more demanding, and more critical, with distinct initial attitudes toward public health. As tutors, we need to establish respectful and trusting relationships through clear communication, flexibility, and continuous acquisition of new skills and teaching approaches. The ultimate task is to gradually, unobtrusively, and in a student-friendly manner, convey the value of public health knowledge, skills, and competencies for their future professional roles.

Keywords: Educational Measurement; Public Health; Students; Teaching Methods

AWARENESS AND READINESS OF DEPARTMENT OF RADIOLOGY FACULTY MEMBERS FOR MODERNIZING MEDICAL EDUCATION: EXPERIENCES AND ATTITUES TOWARDS MERLIN LEARNING MANAGEMENT SYSTEM AND FLIPPED CLASSROOM

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Aim: This study aimed to evaluate the awareness, perceptions and readiness of faculty members in the Department of Radiology, Medical Faculty, University of Rijeka toward implementing modern educational methods, focusing on the Merlin learning management system (LMS) and the flipped classroom model. The goal was to explore current use, perceived benefits and challenges, and to identify faculty needs for training and institutional support.
Materials and Methods: An online survey was conducted between 16 and 19 September 2025 among 18 faculty members, of whom 13 responded (72% response rate). Participants represented diverse academic ranks, including assistants, PhD holders, and associate or full professors. The questionnaire consisted of two sections: 1) use and evaluation of the Merlin LMS, and 2) perceptions and experiences with the flipped classroom model. Data were analyzed using descriptive methods.
Results: All participants reported prior experience with the Merlin LMS, primarily using it to share teaching materials, manage assignments, and communicate. Advanced features, such as progress tracking, were rarely used. Five out of eighteen respondents described a clear understanding of the system, while the rest reported only partial familiarity. Common challenges included time constraints, limited technical knowledge, and occasional technical issues. Most respondents (nine out of thirteen) were familiar with the flipped classroom model, though only five reported a strong understanding. The majority (10/13) perceived it as useful for improving teaching quality through increased student engagement, active learning, and more effective use of classroom time. However, barriers included extensive preparation workload, uncertainty about student preparation, and limited training. Across both sections, faculty consistently emphasized the need for structured support in the form of workshops, mentoring, written guidelines, and technical assistance.
Conclusions: Faculty members in the Department of Radiology demonstrate a positive attitude and moderate readiness to modernize medical education through active learning models and digital platforms. Although awareness and basic engagement are high, effective integration of these innovations requires institutional support, training, and the sharing of best practices.

Keywords: Computer-Assisted Instruction; Medical Education; Medical Faculty; Online Systems; Teaching

Workshop

FROM VERBS TO DOMAINS: HOW TO RECOGNIZE A GOOD LEARNING OUTCOME?

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The aim of this workshop is to enhance participants' ability to formulate clear, measurable, and constructively aligned learning outcomes by correctly linking verbs to cognitive processes and knowledge dimensions within Bloom's taxonomy. Constructive alignment is a cornerstone of contemporary medical education, ensuring coherence between intended learning outcomes, teaching and learning activities, and assessment methods. However, writing clear and measurable learning outcomes remains a common challenge among educators. This interactive workshop will aid participants in recognizing well-constructed learning outcomes by linking active verbs to the appropriate domains and cognitive levels of Bloom's taxonomy. The workshop will include two hands-on activities. In the first activity, participants will classify learning outcomes into the correct fields of the cognitive domain matrix. This activity will reinforce understanding of the taxonomy and highlight frequent misconceptions about verb selection and domain alignment. In the second activity, participants will analyze examples of different learning outcomes, identifying linguistic and structural features that affect their clarity, measurability, and alignment with assessment. Through collaborative discussion, participants will develop practical strategies for refining their own outcomes to support constructive alignment in course design. By the end of the workshop, participants will be able to: (1) identify inconsistencies between verbs, domains, and cognitive levels; (2) distinguish features of effective and ineffective learning outcomes; and (3) apply criteria for improving learning outcomes in their own teaching contexts.

Keywords: Competency-Based Education; Educational Models; Learning Outcomes; Medical Education

Session C13. KEYNOTE TRANSFORMATIVE SESSION - TRENDS IN ASSESSMENT

PAST, PRESENT, AND FUTURE: ASSESSMENT FOR LEARNING AT NBME

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The aim of this presentation is to invite faculty to reimagine assessment as a dynamic element of learning rather than a static measure of performance. Drawing on lessons from the National Board of Medical Examiners (NBME) and its collaborations with medical schools worldwide, the session explores how thoughtful integration of assessment for, of, and as learning can enhance both teaching and student development. Through examples of formative and summative tools, research on validity and outcomes, and faculty-driven innovations, participants will reflect on how assessment data can be used to promote dialogue, self-directed learning, and continuous program improvement. The presentation emphasizes practical, scalable ideas—such engaging students in performance discussions, or drawing on shared research to inform curricular decisions. Complementary NBME resources, including the Item-Writing Guide and NBME® Academy professional development offerings, will be highlighted as freely available tools that support faculty in fostering assessment literacy and evidence-informed teaching. The session underscores the evolving role of educators as designers of meaningful assessment experiences that connect measurement, learning, and professional identity formation.

Keywords: Assessment; Faculty Development; Feedback; Medical Education; Psychometrics

AI IN FUTUREMED ASSESSMENT: LARGE LANGUAGE MODELS GRADING STUDENT NOTES

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Aim: To determine the reliability and validity of using a widely available, zero-shot large language model to grade medical student post-encounter notes from Objective Structured Clinical Examinations, and to examine how rubric structure and case presentation influence grading performance.
Materials and Methods: We analyzed 433 de-identified notes written by third-year medical students across seven standardized cases and scored previously by two faculty raters using a seven-domain rubric (history, physical examination, summary statement, differential diagnosis, justification, plan, organization). The same rubric was provided to a large language model in two configurations: repeated scoring without explanations (thirty iterations per note) and repeated scoring with step-by-step rationales (four iterations per note). Internal consistency was evaluated with the intraclass correlation coefficient; agreement and relative ordering were evaluated with quadratic weighted kappa, one-way analysis of variance with Tukey post-hoc testing, pairwise t-tests, and rank-order correlation. Subgroup analyses examined performance by case type, domain, and inferred case difficulty.
Results: Human raters showed substantial to excellent internal agreement (intraclass correlation coefficient 0.880). The large language model demonstrated very high internal consistency without explanations (0.943) and moderately high consistency with explanations (0.762). Absolute scores diverged: human graders assigned the highest mean scores, the model with explanations was intermediate, and the model without explanations was lowest; differences were statistically significant across the full sample and within every case type. Agreement between human graders and the model was limited overall, although relative ordering of notes was moderately preserved, and alignment improved when the model produced rationales, particularly for analytic domains such as physical examination and differential diagnosis. The organization domain showed weaker consistency and alignment, suggesting rubric–method mismatch. Case difficulty did not meaningfully affect model error.
Conclusions: A zero-shot large language model can grade post-encounter notes with high repeatability and stable behavior across cases and rubric domains, but absolute score differences compared with faculty highlight the need for calibration and potential rubric refinement before high-stakes use. Thoughtful integration—favoring rationale-based scoring, aligning domain criteria, and using automated scoring to augment rather than replace faculty—may reduce rater workload, speed feedback, and surface opportunities to improve assessment design.

Keywords: Artificial Intelligence; Clinical Assessment; Natural Language Processing; Objective Structured Clinical Examinations

THE SOCRATIC TUTOR: A STUDENT-DEVELOPED GENERATIVE AI PLATFORM FOR MEDICAL EDUCATION

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Aim: To evaluate the *Socratic Tutor*, a student-developed artificial intelligence platform designed to enhance learning efficiency, self-assessment, and critical reasoning among medical students through institutionally governed generative AI.
Materials and Methods: The *Socratic Tutor* combines three integrated tools: (1) an adaptive Socratic chatbot that conducts guided, conversational tutoring based on uploaded course materials; (2) an automated question generator that produces USMLE-style items directly linked to faculty learning objectives; and (3) a secure analytics dashboard that visualizes user performance, accuracy, and engagement trends. All data are processed within a closed university API to ensure FERPA compliance and protect faculty intellectual property. The research employs a quasi-experimental pre-/post-test design involving first- and second-year students across all UK College of Medicine campuses. Propensity Score Matching (PSM) will balance user and non-user groups by MCAT, GPA, and baseline course scores. Quantitative measures include course exam performance, comprehensive block exams, and Step 1 scores. Qualitative analyses will evaluate changes in study habits, perceived efficiency, and student attitudes toward AI-assisted learning.
Results: Preliminary deployment revealed high engagement and overwhelmingly positive sentiment, with early users reporting improved comprehension and faster concept mastery through interactive dialogue. Engagement metrics indicate that heavy users exhibited both greater time efficiency and superior test outcomes compared to low-use counterparts.
Conclusions: The *Socratic Tutor* represents a novel educational framework for integrating generative AI responsibly within a medical curriculum. Its architecture supports longitudinal data analysis, adaptive feedback, and curricular mapping, laying the groundwork for predictive analytics that can identify at-risk learners earlier in training. Developed by students for students, this project demonstrates the potential for AI co-design within medical education and offers a replicable model for other institutions seeking to modernize learning environments while safeguarding data integrity.

Keywords: Artificial Intelligence; Computer-Assisted Instruction; Curriculum Development; Learning Analytics; Natural Language Processing

ADVANCING TEAMWORK AND COMMUNICATION ASSESSMENT THROUGH VIRTUAL REALITY SIMULATION IN MEDICAL EDUCATION

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Aim: Teamwork and communication are critical competencies that directly influence patient outcomes, particularly in high-stakes resuscitation scenarios. Traditional simulation-based education effectively develops these skills but remains resource-intensive, logistically complex, and difficult to scale, especially in underserved or geographically isolated environments. Virtual Reality (VR) offers a dynamic, reproducible, and accessible platform for immersive team training and assessment. This project, developed through the National Board of Medical Examiners (NBME) Strategic Educator Enhancement Fund (SEEF) Fellowship, investigates how VR can be used to evaluate and enhance teamwork and communication using the Team Emergency Assessment Measure (TEAM™) instrument, which is supported by substantial validity evidence.

Materials and Methods: In this multi-institutional study, healthcare professionals participate in a standardized cardiac arrest scenario (medvr.education) involving defibrillation, CPR, pharmacologic intervention, airway management, and post-resuscitation transfer. TEAM™ scores across leadership, teamwork, and task management domains are collected alongside participant perceptions of engagement, realism, and educational value. The study aims to (1) determine whether VR-based simulations can effectively assess teamwork and communication among experienced healthcare teams using the TEAM™ instrument; (2) explore participants' perceptions of how VR impacts teamwork and communication skills; and (3) examine how VR performance scores, which assess technical aspects of team performance, correlate with communication and teamwork domains.

Results: Data collection and analysis are ongoing. Pilot testing indicates the VR simulation effectively elicits teamwork and communication behaviors measurable by the TEAM™ instrument.

Conclusion: This project showcases the NBME–faculty collaboration model developed through the SEEF Fellowship as an adaptable framework for advancing assessment innovation and faculty development that can be adopted globally to enhance competency-based medical education.

Keywords: Assessment; Communication; Medical Education; Simulation Training; Teamwork; Virtual Reality

ASSESSMENT OF RESULTS IN ANATOMY OVER A DECADE: TRENDS AND CRITICAL ROLE OF CONTINUOUS ASSESSMENT

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Aim: Optimizing assessment strategies in medical education requires understanding how student performance evolves; however, comprehensive, multi-year analyses remain rare. This research aimed to provide critical evidence by examining decade-long trends in examination patterns and identifying key predictors that could inform evidence-based curricular interventions.
Materials and Methods: This retrospective longitudinal study analysed anatomy examination results at the University of Split School of Medicine over 11 years (2013/14–2023/24), involving 1,116 medical students. The anatomy exam format includes four elements, each contributing to the final grade with specific weighting: continuous assessment (CA) (10 %), written (40 %), practical (20 %), and oral examination (30 %). Data analysis included linear regression for temporal trends, correlation analysis for exam component and failure rate relationship, and comparison of performance across exam components, with CA being most comprehensively examined.
Results: Analysis revealed a significant downward trend in overall pass rate (-0.7 % per year, $P = 0.005$), with an alarming post-COVID exacerbation (-3.2 % per year, $R^2 = 0.996$, $P = 0.041$). Also, grade distribution shifted toward lower grades (unsatisfactory and satisfactory), reaching record levels, even surpassing the proportion of higher grades (good, very good, and excellent). At the cohort level, CA performance demonstrated a very strong correlation with overall failure rate (Pearson r = -0.801, $P = 0.002$). Linear regression confirmed its predictive validity ($R^2 = 0.642$, $P = 0.003$), with a 1 percentage point increase in mean CA score associated with a 0.34 percentage point decrease in the failure rate. Furthermore, students who passed in earlier sittings achieved significantly better CA scores, with a 19.5% decline between the 1st and 5th sitting ($P < 0.001$). Longitudinal analysis of CA results (2013/14–2023/24) revealed a cumulative decline of 15.9 % over the study period ($P < 0.001$).
Conclusion: Student engagement during the teaching block strongly correlates with final examination success. Based on these findings, we implemented a data-driven curricular adjustment by increasing CA weighting from 10 % to 20 % to promote consistent engagement and address the declining performance trend.

Keywords: Anatomical Knowledge; Anatomy Teaching; Evaluation Techniques; Gross Anatomy; Students' Performance

MEASURING LEARNING OUTCOMES AMONG DOCTORS IN TRAINING, UK EXPERIENCE

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How do you keep a track of progression and measure learning outcomes among doctors in training? For number of years, NHS had introduced mandatory portfolio for all doctors, on all levels of training. Number of portals such as ISCP (Intercollegiate Surgical Curriculum Programme) are easy way for trainees to upload their educational achievements online, such as discussion of cases or surgical operations. In addition, it is tool that allows insight to trainee's mentors to their progression and it is essential evidence on annual trainee's review (appraisal) as well for the CCT (Certificate of Completion of Training). Essentially, surgical portfolio is trainee's brickwork to track and prove their progression during training, but also a step into further professionalism as consultant.

Keywords: Learning Outcomes; Mentorship; Performance Evaluation; Postgraduate Education; Surgical Education; Trainee Portfolio

AN INSIGHT INTO SECOND-YEAR MEDICAL STUDENTS' EXPERIENCES OF CLINICAL TRAINING

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Aim: Our research focuses on the experiences of second-year medical students at the Catholic University of Croatia during their first clinical practice within the Virtual Patient course. Combining lectures with many hours of clinical skills training, the program equips students with skills essential for the management of emergency medical conditions and the care of patients with compromised vital functions. Such early exposure to clinical practice is what distinguishes our faculty from other medical schools in Croatia.
Materials and Methods: We conducted a Google Forms survey with eighteen questions exploring students' experiences during the *Virtual Patient* course. Fifteen questions used a five-point Likert scale, one was demographic, one was multiple-select (three choices), and the final question was open-ended. The study included twenty-seven third-year medical students who had completed the course in their second year. Data were analyzed using descriptive statistics automatically generated by Google Forms.
Results: In the multiple-choice questions using a five-point Likert scale, all participants expressed their agreement with the statements that the experience of early clinical training was positive, that it served as motivation for further medical education, and that it helped them better understand the theoretical knowledge gained through lectures. In the multiple-select question, participants were asked to choose three elements of their clinical training they found most useful, and most often selected learning clinical skills for managing basic emergency interventions, easier integration of theory and practice and increased motivation for learning and completing their studies. Twenty-six students stated that performing clinical skills at an early stage of learning increased their confidence in working with patients. The majority of students stated that observing their mentor professors in real working conditions further motivated them and helped them understand how knowledge is applied in practice.
Conclusion: Based on the results of our research, we conclude that the integration of courses with extensive clinical skills training is beneficial even in the second year of medical education, although at this stage of study students may still lack a substantial amount of theoretical knowledge. Despite the fact that organizing a course with clinical training this early in medical education is quite complex, it provides many benefits for medical students and should be implemented in the standard curriculum.

Keywords: Clinical competence; Education; Medical students; Motivation.

INTERMed PROJECT: HOW STANDARDISED TEACHING, LEARNING AND ASSESSING BASIC CLINICAL SKILLS IN INTERNAL MEDICINE INCREASES STUDENT AND TEACHER SATISFACTION

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Aim: Given considerable discrepancies among clinical teachers in teaching and assessing basic clinical skills in internal medicine (including patient history-taking and physical examination), the Department of Internal Medicine and the Centre for Medical Education at the Faculty of Medicine in Rijeka jointly initiated the educational project INTERMed. The project aimed to virtually standardise the mandatory course Clinical Propedeutics through contemporary evidence-based educational methodologies, including flipped classroom, Peyton's and Pendleton's methods, and objective structured clinical examinations. This study evaluated the impact of INTERMed on the satisfaction of medical students and educators regarding the teaching and learning of basic clinical skills.

Materials and Methods: A multi-phase cross-sectional study was conducted between October 2024 and May 2025, involving 193 medical students [83/120 (69.2%) fourth-year and 74/104 (71.2%) fifth-year students who had completed the unreformed Clinical Propedeutics course, and 36/114 (31.6%) third-year students enrolled in the INTERMed project], as well as 12 clinical teachers participating in the project. Distinct, comprehensive, and standardised questionnaires were distributed to each participant group, covering periods before, during, and after the INTERMed project, and assessed attitudes, behaviours, and knowledge regarding teaching and learning of clinical skills.

Results: The median overall satisfaction of students and educators following the INTERMed project was 5 (IQR 5–5) for both asynchronous online preparations (flowcharts, demonstration videos, self-assessment tests) and onsite practical sessions. A statistically significant difference was observed in students' perceptions of the consistency among educators in teaching and assessing identical clinical skills, comparing those who completed the Clinical Propedeutics course before and after the INTERMed project (median 4th/5th year = 2, IQR 2–3; median 3rd year = 4, IQR 4–5; $P<0.001$). At onsite practicals, 77.8% of INTERMed students received teacher instruction and 88.3% observed a patient demonstration, compared with 31.2% and 26.7% of senior students, respectively ($P<0.001$). Furthermore, 94.4% of INTERMed students received feedback after performing clinical skills, compared with 28% of senior students ($P<0.001$). Unlike senior students (27.4%), all INTERMed students prepared consistently for practicals, with 83.3% spending under 30 minutes, reporting readiness and confidence.

Conclusion: The INTERMed project successfully standardised clinical skills teaching, enhancing confidence, engagement, and satisfaction for both learners and educators.

Keywords: Clinical Skills; Flipped Classroom; Internal Medicine; Medical Education; Objective Structured Clinical Exam; Teaching Standardisation

FROM STRESS TO SUCCESS: HOW TARGETED SHORT TESTS IMPROVE PERCEIVED LEARNING OUTCOMES

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Aim: This study compared medical student satisfaction with learning when assessed by short, targeted quizzes on Electrocardiography (ECG) reading and interpretation versus a comprehensive end-of-course Internal Medicine exam. We hypothesized that focused quizzes on identified difficult curriculum areas would improve students' perceived knowledge and satisfaction relative to traditional end-of-course summative exams.
Materials and Methods: We conducted a cross-sectional study of 150 fourth-year medical students at the University of Zagreb School of Medicine following their completion of the Internal Medicine course. Of these, 148 completed the ECG quiz survey, and all 150 completed the Internal Medicine exam survey. The ECG quiz assessed reading and interpretation skills, whereas the Internal Medicine exam was a comprehensive final assessment that did not include ECG questions. Students self-reported satisfaction with their knowledge on a scale from 0 (not at all satisfied) to 100% (completely satisfied). Due to non-normal distributions, we used the Mann-Whitney U test for analysis and estimated effect size with Cohen's d and rank-biserial correlation.
Results: Students reported significantly higher perceived knowledge after completing the ECG quiz (mean 86.46%, median 100%) compared to after the comprehensive internal medicine exam (mean 74.61%, median 75%). The 11.85 percentage point difference between these two assessment types was statistically significant ($p < 0.001$), supporting our hypothesis. The effect size was moderate (Cohen's $d = 0.69$). Furthermore, 52% of respondents in the ECG quiz survey reported maximum satisfaction, compared to 18% in the internal medicine exam survey.
Conclusion: Short, targeted assessments in challenging areas of a course (such as ECG interpretation in Internal Medicine) lead to greater student satisfaction and higher perceived knowledge than traditional comprehensive exams. When a topic is widely recognized as difficult, implementing a focused evaluation can help students consolidate knowledge and feel more confident in their competence, rather than offering only comprehensive assessments. This approach may support improved engagement and long-term learning among medical students in demanding subjects like internal medicine.

Keywords: Electrocardiography; Internal Medicine; Medical Education; Surveys and Questionnaires

LEVEL OF EDUCATION OF MEDICAL STUDENTS IN AIRWAY MANAGEMENT SKILLS

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Aim: To evaluate medical students' education and competence in airway management.
Materials and Methods: In 2024/2025, a Google Docs survey was distributed to 5th- and 6th-year medical students at the University of Zagreb via LMS and WhatsApp, with departmental approval.
Results: A total of 79 students completed the survey (54.4% 5th year, 45.6% 6th year). Of these, 70.9% attended anesthesiology classes. Most students (94.9%) believed endotracheal intubation should be taught during rotations, while only 1.3% disagreed; 1.3% felt professors should demonstrate intubation but mastery was unnecessary due to easier alternatives such as i-gel, and 1.3% supported learning airway maintenance without intubation. Regarding basic airway techniques, all identified head tilt, 94.9% chin lift, 93.7% jaw thrust, 49.4% airway adjuncts, 35.4% mask ventilation, and 1.3% lateral head positioning. For advanced methods, 92.4% selected indirect laryngoscopy, 91.1% direct laryngoscopy, 75.9% supraglottic device, 74.7% fiberoptic intubation, 50.6% retrograde intubation, and 2.5% cricothyroidectomy. When asked which skills should be acquired during medical studies, the most frequent were oropharyngeal tube placement (97.5%), mask ventilation (93.7%), direct intubation (92.4%), supraglottic device placement (87.3%), and nasopharyngeal tube placement (84.8%), with fewer supporting cricothyroidectomy (45.6%), indirect intubation (36.7%), fiberoptic intubation (15.2%), and). Practical exposure varied: 48 placed an laryngeal mask airway on a mannequin, 33 during anesthesiology rotations, 30 in the fundamental of clinical skills course, 5 in first aid, 8 never, 2 unsuccessfully, and 4 elsewhere. Only 18 students placed an LMA on patients under supervision, mostly during exercises or rotations, while 61 had not. For intubation, 47 practiced direct laryngoscopy on mannequins (mostly in courses or rotations), 9 attempted video laryngoscopy, and fewer succeeded on patients (16 with DL, 9 with VL). Unsuccessful attempts were reported by several students in both mannequin and patient practice.
Conclusion: Airway management forms the cornerstone of both anesthesiology and resuscitation. Therefore, it is vital for every physician to develop at least basic competence in this crucial skill. This study shows that medical students at the University of Zagreb value airway management and support learning both basic and advanced techniques. While theoretical knowledge is strong, practical experience—especially with advanced procedures like intubation and video laryngoscopy—is limited. Expanding structured, supervised, and simulation-based training is essential to build competence, confidence, and ensure patient safety.

Keywords: Airway Management; Education; Endotracheal Intubation; Supraglotic Airway Devices

MEDICAL STUDENTS' PERSPECTIVES ON ARTIFICIAL INTELLIGENCE: A COMPARATIVE STUDY FROM CROATIA AND SLOVAKIA

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Aim: The aim of this study was to explore medical students' attitudes, opinions, and intentions regarding the use of artificial intelligence (AI) in future patient care. As AI is transforming medicine and reshaping the physician - patient relationship, understanding the perspectives of future physicians is of great importance. Given the social similarities between Croatia and Slovakia, the study also sought to identify potential differences in students' views across these two countries.
Materials and Methods: The study was conducted between May and November 2022 among medical students from five Croatian and three Slovak medical schools, with international students analyzed as a separate subgroup. A total of 1701 students from all years of study were included using a non-probabilistic convenience sample. Data were collected during lectures through a paper-based survey or, at one Slovak university, via an online link. The questionnaire was an original instrument developed by the Digit-HeaL research team. All statistical analyses were conducted using SPSS version 25.
Results: Only 38.2% of students felt well acquainted with the concept of AI, and just one in five reported being introduced to its use in healthcare during their studies, while 14% pursued additional research outside the curriculum. Despite this limited exposure, 44.8% expected to actively use AI in their future practice, although 35.3% doubted they would graduate with sufficient skills to do so. Most students (86.6%) agreed that AI can be a helpful tool for physicians. At the same time, 59.1% believed it could negatively impact the patient–physician relationship, and 51.3% feared patients would trust physicians less as digital technologies are increasingly implemented, with Slovak and Croatian students expressing stronger concerns than international students. Just over half (53.6%) felt confident they could explain AI technologies to patients if asked, with international students showing the lowest confidence. When considering broader healthcare implications, 48.7% of students believed that implementing AI would improve the healthcare system, 57.8% emphasized that equal access to AI must be ensured, while only 7% supported the idea that patients should directly pay for AI-based diagnosis or treatment.
Conclusion: Medical students recognize the potential of AI as a valuable tool in healthcare, yet report limited formal education and insufficient preparedness to use it in future. The findings highlight the importance of integrating AI-related education into medical curricula, with particular emphasis on preserving the physician - patient relationship.

Keywords: Artificial Intelligence; Medical Education; Medical Students; Physician Patient Relationships

MEDICAL STUDENTS AND AI: GENERATIONAL GAP?

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The use of generative artificial intelligence (AI) has become increasingly common for university students. These tools provide new possibilities for learning, however, if they remain overlooked by the formal curriculum many opportunities could be missed upon. This study aims to quantify and interpret the habits and opinions of medical students regarding AI tools, with the goal of gaining insight on the exact way they use AI to incorporate these tools easily and effectively in formative medical education. This cross-sectional study was conducted between September 22 and October 15, 2025. During this period, 1st and 4th year students from the University of Zagreb School of Medicine were invited to participate. The study used an anonymous web-based survey. Questions were designed to capture multiple perspectives on the topic. The survey contained 47 questions on a wide range of topics. The survey was answered by 385 students: 283 1st year students and 102 4th year students. 1st year students started using AI tools during high school and 4th year students started once they were already enrolled in higher education. Data analysis used descriptive statistics (median, mean, standard deviation, Shapiro-Wilk normality test, total number of responses, and percentages) and either the chi-square or Mann-Whitney U tests, as appropriate. The survey revealed that the majority of students used AI tools (90,6%) regardless of their study year. The most often used AI tool was ChatGPT by OpenAI with a prevalence of 88,8%. AI tools have become a habit for older students (57,8%) much more so than for the younger ones (39,2%). In question about the usage of generative AI for writing assignments we see the opposite; 1st year students use it more often (40,6%) in contrast with 4th year students (33,3%). They show different levels of trust in AI too. General trust is higher with 4th year (77,5%) compared to 1st year (42,8%). This trend continues in trust for medical related questions: 1st year – 27,9%, 4th year – 61,7%. Questions about checking answers against literature showed that 1st year students check answers more often (59,8% vs. 49,0%) which was logical conclusion of preceding data. This study revealed clear differences between 1st and 4th year medical students in their use and trust in AI tools. Older students showed greater confidence and habitual use, while younger students used AI more cautiously and verified its outputs more often. These results point to a generational gap in digital confidence and highlight the need to include AI literacy in medical education to promote informed and responsible use.

Keywords: Artificial Intelligence; ChatGPT; Learning; Medical Students; Medical Education

MISS4HEALTH ERASMUS+ PROJECT: MICROCREDENTIALS IN SOFT SKILLS FOR HEALTHCARE PROFESSIONALS AND STUDENTS

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This lecture aims to present MISS4Health, an international project that focuses on improving soft skills education for healthcare professionals. The project develops an interactive and modular online course (MOOC) that follows the European Micro-credential Framework. It teaches key skills such as communication, decision-making, leadership, situational awareness, and teamwork. A major part of the learning approach is the use of serious games, which offer a safe and realistic environment to practise complex clinical situations. These games help increase learner motivation, support learning through experience, and provide immediate feedback that makes it easier to remember and apply new skills in real practice. The course also includes multimedia materials, self-assessment tools, and personalised feedback so that participants can follow their progress and identify what they need to improve. By offering a structured and officially recognised digital training programme that can be used across Europe, MISS4Health supports professional development, encourages lifelong learning, and provides a flexible model that can be adapted to different healthcare settings. Early implementation and pilot testing are expected to show clear improvements in soft skills and higher levels of engagement among participants.

Keywords: Medical Education; Micro-credentials; Serious Games; Soft Skills

ERASMUS+ BLENDED INTENSIVE PROGRAM »DIAGNOSTICS IN GYNECOLOGY« - MARIBOR EXPERIENCE

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The Erasmus+ blended intensive program (BIP) »Diagnostics in gynecology« is intended for senior medical students with the aim of developing essential clinical reasoning skills and critical thinking abilities in various clinical situations. Through the theoretical and practical parts of the workshop, students learn how to assess risks and deal with common complications that arise in frequently encountered clinical situations in gynecology. The practical part of the workshop is conducted in accordance with the needs identified in the previously completed virtual part of the program. The virtual part of the program focus primarily on the development of clinical reasoning skills. As part of the virtual part of the program teachers encourage students to think critically and use the available diagnostic tools correctly. In the face-to-face part of the workshop, the lectures are divided so that each day they focus on one of the more commonly used diagnostic techniques in modern gynecology. These are ultrasound, hysteroscopy, laparoscopy and colposcopy. The other part of the day is devoted to the application of theoretical knowledge in a clinical setting. Teachers achieve this by involving students in clinical work with patients, as well as by using learning methods based on specific clinical problems. In the practical part, they also enable students to practice on simulators, where they are able to apply the knowledge acquired in lectures in clinical practice. The exercises take place in parallel in smaller groups. The virtual part of the BIP begins in spring each year, prior to the face-to-face part of the program. Initially, the virtual part is dedicated to assess students' prior knowledge and serve as the basis for the optimal preparation and implementation of the workshop. Subsequently, approaches to critical diagnostic thinking and decision-making processes in modern clinical medicine are presented. The virtual part is also necessary to familiarize students with the online platform that is used to conduct the practical part of the workshop. After the practical workshop is completed, teachers use the virtual platform to reassess the students' clinical diagnostic thinking. In this way, they re-evaluate the knowledge acquired during the workshop and compare the results with the students' initial knowledge. At the Faculty of Medicine in Maribor we organized first BIP »Diagnostics in gynecology« in May 2022. Since then, three more courses were performed. In 2022, there were 28 participants from 6 countries, in 2023 25 participants from 7 countries, in 2024 19 participants from 5 countries and in 2025 23 participants from 10 countries.

Keywords: Combined Program; Diagnostics; Erasmus; Gynecology; Students

AN INNOVATIVE APPROACH TO SUPPORTING CRITICAL THINKING THROUGH THE ONLINE NANO-THINK PROGRAM

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Aim: The ERASMUS+ project NANO-THINK aims to explore how digital environments can foster the development of critical thinking among students. In a society where information is abundant but accuracy and credibility often remain low, new competences are required that include the ability to analyze, to critically think and form evidence-based judgments have become some of the key 21st-century competences. The project will accordingly, create a digital-based program for enhancement of critical thinking and explore whether such tool may serve as one possible instrument in fostering critical thinking.
Materials and Methods: The NANO-THINK platform and the corresponding content is developed collaboratively based on the concept of micro- and nano- learning and according to the performed surveys aimed to collect comprehensive insights into the current state of critical thinking skills development in science education within participating Higher Education Institutions (HEIs) students and academic staff in Austria, Croatia, Bosnia and Herzegovina, Serbia and Montenegro.
Results: Findings of the performed gap-analysis of the field, indicate that students ask for a student-centered teaching approach rather than a passive listening approach. They also think that critical thinking exercises should be embedded directly within the curriculum, making it a consistent focus in their educational experience rather than an isolated component. Online resources and modules have also been acknowledged as beneficial supplementary tools to the interactive and integrated approaches. Moreover, gap analysis showed that the major barriers to critical thinking development at HEIs are traditional teaching methods, curriculum constraints and faculty resistance to new teaching practices.
Conclusion: The NANO-THINK project will explore how digital environments can be used to support the cultivation of critical thinking at the Higher Education Institutions (HEIs) when implemented through thoughtful pedagogical design. The micro- and nano- learning approaches may support students to think actively, reflectively and interdisciplinary for an enriched educational experience. The platform will contribute to an emerging educational culture that connects science, technology, and humanities, preparing students for responsible citizenship in the digital era.

Keywords: Critical Thinking; Digital Learning; Education; Interdisciplinarity; Nanolearning; Reflection

HOW THE PART – TIME AND SHORT CYCLE STUDIES ARE IMPLEMENTED IN MEDICAL/HEALTH CARE EDUCATION - EXAMPLE OF PARTISH ERASMUS+ PROJECT

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The main aim of this paper is to present research conducted over a three-year period in Bosnia and Herzegovina, focusing on the implementation of part-time and short-cycle studies in medical and health care education. The research was carried out at the Faculty of Medicine, University of Zenica, and the Faculty of Medicine, University of East Sarajevo. The Faculty of Medicine in Zenica organized programs in *Child and Adolescent Psychotherapy* and *Occupational Therapy*, while the Faculty of Medicine in East Sarajevo implemented short-cycle programs titled *Dental Implants: From Basic to Advanced* and *Instrumentation in Surgical Practice*. Short-cycle programs have only recently been introduced into the legislative framework of higher education in Bosnia and Herzegovina. However, the distinction between *micro-credentials* and *short-cycle education* is still not clearly recognized, particularly regarding credit transfer and student benefits. According to the conducted survey, short-cycle programs should range between 375 and 1,800 teaching hours, which is often too extensive for developments in medical and health care fields. Therefore, the development of micro-credentials is essential for improving educational flexibility and enhancing student employability. The survey results showed that 52.3% of respondents supported the inclusion of short-cycle and micro-credential programs in higher education, primarily for specialized occupations (80.9%; n = 678). Open-ended responses emphasized that while accelerated programs may risk superficiality and excessive specialization, they also promote efficiency and targeted skill acquisition. The main advantages of short-cycle education include flexibility, integration of theory and practice, and the opportunity for students to apply theoretical knowledge in real-world settings, leading to greater motivation and engagement. On the other hand, challenges include high time demands and limited integration within standard curricula. Results from the four implemented programs in Zenica and East Sarajevo indicate overall satisfaction among both students and instructors. Nonetheless, further improvement is needed in terms of curricular recognition and legislative acceptance.

Keywords: Health Care; Medical Education; Micro-Credentials; Short-Cycle Education

Session C16. SKILLS4LIFE: EMPOWERING HEALTHCARE PROFESSIONALS WITH SKILLS FOR SUCCESS IN THE WORKPLACE

SUCCESSFUL PUBLIC PERFORMANCE FOR A SUCCESSFUL CAREER

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Public speaking skills are essential for almost every profession in today's world. From classical antiquity onwards, the principle articulated by the Roman rhetorician Quintilian remains valid: *the better you speak, the more willing people are to listen to you, and the easier it becomes for them to trust you.* Those who master the art of public performance gain more trust, exert greater persuasive power, and are perceived as more competent and determined. The medical profession is no exception—on the contrary, it is a field in which competence, expertise, and confidence are indispensable for building a strong professional image. Effective public speaking contributes significantly to this perception. Naturally, eloquence cannot replace medical knowledge and experience. However, it can enhance the way expertise is communicated and strengthen the impression of authority, reliability, and care. Public speaking is not an innate gift but a skill that can be learned, practiced, and refined. It enriches professional education by enabling practitioners to share their knowledge, demonstrate competence, and engage effectively with colleagues, co-workers, and the wider public. As Cicero observed, *knowledge without eloquence is useless, while eloquence without knowledge is dangerous.* By integrating public speaking into professional development, we can ensure that those with valuable knowledge become more influential and impactful—not only within their professions but also in their communities and societies.

Keywords: Audience; Public Speaking; Eloquence

TEACHING WHAT AI CANNOT: USING APPLIED IMPROVISATION TO ENHANCE RELATIONSHIP-CENTERED COMMUNICATION AND FEEDBACK

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Aim: To explore the current state of relationship-centered communication (RCC) and feedback delivery in emergency medicine, contrast it with an ideal future state, and demonstrate how applied improvisation can bridge the gap by teaching communication skills that remain uniquely human and cannot be replicated by artificial intelligence. This work highlights the urgency of reinforcing empathy, emotional attunement, and psychological safety amid increasing digital documentation demands and time pressure.
Materials and Methods: We developed a three-session curriculum integrating improvisational theater techniques with RCC principles and structured feedback models (SFED, ATA, R2C2), guided by Kern's six-step curriculum design framework. The lecture positions this curriculum as a case study for rehumanizing communication training. Each session combined short didactic segments, facilitator-modeled scenes, and breakout improv exercises emphasizing "Yes, and" skills, active listening, gift-giving, and collaboration. Debriefs explicitly linked improv principles to RCC microskills (e.g., empathy, open-ended questions, teach-back) and feedback structures, allowing participants to practice skills in a psychologically safe environment and reflect on their application in clinical teaching. Participants completed post-session 5-point Likert ratings and open-ended reflections. Thematic analysis was performed on qualitative responses.
Results: Fifty-two learners (medical students, interns, residents) participated. Likert ratings were highly positive for structure (96.1%), engagement (100%), relevance (92.3%), and facilitator skill (88.5%). Thematic analysis revealed four key themes: (1) enjoyment and engagement, (2) connection to patient care, (3) application of improv to feedback and communication, and (4) openness to future use. Representative comments included: "The Red Ball activity was simple but highlighted important points about communication breakdowns" and "I'll use 'Yes, and' to make feedback more open and collaborative." Participants expressed a shift toward more deliberate, empathic, and structured communication practices and recognized the importance of preserving these human elements in an era of digitalization and AI integration.
Conclusion: The results suggest that this approach may help sustain relational skills despite technological pressures. Future studies should explore objective behavioral outcomes and the longitudinal impact of repeated improv exposure**.**

Keywords: Artificial Intelligence; Communication; Emergency Medicine; Empathy; Feedback; Professional-Patient Relations

Workshop

MASTERING PUBLIC SPEAKING SKILLS WORKSHOP

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This workshop is designed to equip medical professionals with the essential skills for effective public communication, whether in patient consultations, interdisciplinary team meetings, or professional conferences. Participants will learn to deliver clear, confident, and engaging presentations, using body language, structured content, and a fluent, professional speaking style.
Following the principle of *"learn and apply"*, the workshop combines practical exercises with targeted feedback. Participants will have the opportunity to practice real-life scenarios, receive constructive guidance, and identify both strengths and areas for improvement in their public performance.
The program will cover:

- Impromptu speaking: strategies for communicating confidently without prior preparation, useful for unexpected questions from patients, colleagues, or conference audiences;
- Nonverbal communication: mastering gestures, posture, and facial expressions to convey confidence, empathy, and professionalism;
- Assertiveness and audience engagement: techniques to maintain authority, capture attention, and foster trust in both patient interactions and professional presentations;
- Logical and coherent presentation: structuring information so that complex medical concepts are accessible and memorable for colleagues, patients, or public audiences.

Additionally, participants will learn practical voice-strengthening exercises and techniques to improve diction and pronunciation, ensuring their speech is clear, precise, and professional.
For each aspect of successful public performance, participants will receive guidance, practice exercises, and individualized feedback. By the end of the workshop, medical professionals will be better prepared to communicate their expertise effectively, inspire trust, and make a lasting impact in clinical, academic, and public settings.

Keywords: Body Language; Presentations; Public Speaking; Speech Structure

TRANSFORMATION OF PRECLINICAL EDUCATION THROUGH EARLY CLINICAL INTEGRATION: AN INNOVATIVE APPROACH TO TEACHING PATHOPHYSIOLOGY

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Pathophysiology represents the critical interface between basic sciences and clinical medicine. Traditional preclinical education often lacks clinical context, leading to fragmented learning and limited understanding of disease mechanisms. Recent educational evidence strongly supports early clinical exposure and the active involvement of clinicians in preclinical teaching as key factors that enhance learning motivation, conceptual integration, and professional identity formation. Pathophysiology, taught in the second year of study, provides an ideal platform for this integration by linking fundamental biological mechanisms with clinical reasoning. The objective is to present an innovative educational model in which clinicians actively participate in teaching pathophysiology and gradually continue this integrative role across subsequent courses—from medical propedeutics to internal medicine—thereby promoting continuous and clinically contextualized learning from the earliest stages of medical education. Description: In this model, clinical specialists are incorporated into the teaching of pathophysiology through case-based discussions, demonstration of diagnostic reasoning, and joint teaching sessions with basic science faculty. By engaging the same clinicians who later teach in courses such as medical propedeutics and internal medicine, this model ensures curricular coherence and continuity. Educators familiar with foundational concepts can effectively bridge theoretical knowledge with clinical practice and support the development of integrated clinical reasoning. This approach builds progressive vertical integration throughout the curriculum, aligning with the three-tiered structure of basic, advanced, and clinical pathophysiology. Early clinical integration within pathophysiology teaching, supported by collaboration between clinicians and basic science educators, enhances knowledge transfer, promotes clinical reasoning, and fosters a cohesive understanding of disease mechanisms. The participation of the same clinicians across preclinical and clinical courses strengthens continuity in learning and reinforces students' ability to connect foundational knowledge with patient care. This model aligns with global trends in competency-based and integrated medical education and represents a sustainable framework for bridging the preclinical–clinical divide.

Keywords: Case-Based Learning; Clinician Involvement; Early Clinical Integration; Medical Education Reform; Pathophysiology; Vertical Integration

FROM BEDSIDE TO SCHOOL BENCH: THE ROLE OF CLINICAL DATA IN UNDERSTANDING BASIC HUMAN BIOLOGY

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Education provides the essential foundation that enables students to apply their knowledge in their future professions. In medicine, this foundation lies in a thorough understanding of human biology, which is crucial for recognizing and treating disease. Yet, particularly in horizontally structured curricula, the link between biological principles and the clinical practice taught in later years can be lost. In this lecture, I will outline strategies for integrating clinical knowledge into traditional pre-clinical education to help students appreciate the relevance of basic biology. I will also highlight translational scientific approaches that can bridge the gap between clinical practice and pre-clinical learning. Using examples, I will show how clinical observations often inspire research questions that must first be explored in fundamental biological models before they can lead to new treatment opportunities.
The aim of this lecture is to underscore the importance of integrating both biology and clinical data to ensure the comprehensive education of the next generation of physicians.

Keywords: Biology; Clinical Competence; Medical undergraduate education; Translational Medical Research

SWISS EXAMPLES OF BRIDGING PRECLINICAL AND CLINICAL STUDIES

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In this presentation, a few examples of how the university of Bern in Switzerland introduces medical students to clinical environments during their preclinical stage in the first three years of their studies will be shown.

Keywords: Clinical Skills; Medical Education; Preclinical Studies

RETENTION OF BASIC SCIENCES KNOWLEDGE IN THE CLINICAL YEARS: THE ROLE OF AN INTEGRATED CURRICULUM IN LIFELONG LEARNING

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Aim: The portion of knowledge retained by the students seems to be the central question for medical education. The aim of this research was to explore the association between the knowledge of basic (physiology and biochemistry) and clinical sciences (internal medicine) among medical students and determine the level of retained basic science knowledge at the fifth year of medical studies.
Materials and Methods: Medical students attending the second (n = 145, response rate 60%) or the fifth year (n = 176, response rate 73%) of medical studies at the Zagreb University School of Medicine in Croatia were given an anonymous knowledge test with 15 pairs of questions developed specifically for this purpose. Each pair consisted of a basic and clinical question, with the correct answer to the basic question explaining the physiological or biochemical background of the clinical question. Three pairs of questions were excluded from the analysis due to poor psychometric characteristics
Results: We found statistically significant correlation between basic and clinical tests scores for both groups of students ($r = 0.47$, $P<0.001$ for the second year and $r = 0.45$, $P<0.001$ for the fifth year). 2×2 within between measures ANOVA revealed a significant interaction effect for knowledge test and study year (Wilks $\lambda = 0.55$, $F1, 319 = 262.7$, $P<0.001$; effect size = 0.45), showing that fifth year students scored lower on the basic test than second year students but obtained higher scores on the clinical test.
Conclusion: Core basic science knowledge is often lost during the clinical years of medical studies. While recalling basic science concepts may not directly influence clinical knowledge, our study shows a positive correlation between retained basic science understanding and clinical performance. This highlights the importance of discussing and optimizing methods and programs for learning medicine. At the Catholic University of Croatia School of Medicine, the curriculum follows a spiral integration model, combining horizontal and vertical integration to ensure coherent, progressive learning. Horizontal integration links basic science disciplines within organ-system modules, while vertical integration connects basic and clinical sciences across all years, enabling early clinical exposure and continuous application of theoretical knowledge. Revisiting core concepts at increasing levels of complexity promotes long-term knowledge retention, clinical reasoning, and the integration of scientific principles into practice. Continuous evaluation and coordination among departments ensure consistency, prevent redundancy, and support the program's educational outcomes.

Keywords: Curriculum; Medical Education; Psychology; Retention; Trends; Undergraduates

CAN UNDERGRADUATE STUDENTS HELP GRADUATE STUDENTS AND VICE VERSA IN OVERCOMING THE CURRENT GAP THAT EXISTS AT THE END OF MEDICAL STUDIES?

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There is a gap between pre-clinicians (researchers) and clinicians. Researchers in laboratories use modern methods of molecular biology, biochemistry and immunology, not understanding the importance of the results for the patient, and clinicians process the obtained data according to their guidelines, without any feedback on the improvement or change of research and development of further methods due to lack of knowledge of the process of laboratory and research work. Building a competency-based medical education emphasizes the mutual cooperation of medicine and multidisciplinarity. Molecular biology and genetics are indispensable parts of the knowledge structure for medical students. The problem is more difficult to solve by changing the current competence and knowledge of researchers and clinicians in practice, therefore, the focus should be on future generations of students in scientific and professional fields (laboratory courses, molecular biology, biochemistry, nursing, etc.). Early clinical and early laboratory exposure is a teaching and learning methodology that encourages medical students to be exposed to patients from the first year of medical school. Early education sessions motivate medical students in various ways, strengthening their academic strength, improving clinical skills, improving communication skills and making them more confident. In this lecture, we will present the activities that we plan to implement through regular study activities as well as project activities in approaching the goal. The intention is to test patients with malignant diseases by providing the necessary diagnostic equipment, and to include each project participant as a collaborator, observer or main participant in the process of getting to know the patient, taking a biological sample, pre-analytical work in the laboratory, obtaining test results, analyzing the significance of the obtained result at an up-to-date level, in the work of the multidisciplinary team of the hospital for cancer treatment and the procedures for making recommendations for further treatment based on detected mutations or other changes. Aims are to master laboratory diagnostic methods by applying already acquired and new knowledge and skills by employees of the University; to connect participants in research and laboratories with clinicians for the benefit of the patient; to increase the clinical impact of the diagnostic-laboratory system; to provide feedback to non-clinicians in order to improve their development; to demystify the translational research continuum regardless of the level of knowledge; to acquire new knowledge from preclinical and clinical work in patients with malignant diseases, and each participant will complete the translational path from the test tube to the decision on the treatment of cancer and be able to choose how to propose therapeutic plans to the patient. The contribution of the project is the translation of the research and laboratory processes of the University and Hospital into the synergy of diagnostics and treatment plans while reducing the gap between laboratory, diagnostic and research work and the treatment of patients with malignant

Keywords: Interprofessional Education; Knowledge management; Premedical Education

ENGAGING MEDICAL STUDENTS IN CLINICAL RESEARCH IN SURGERY: BRIDGING EDUCATION, INQUIRY, AND PATIEN-CENTERED PRACTICE

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The aim of this presentation is to illustrate how undergraduate medical students can be successfully engaged in clinical research in surgery and to demonstrate how such initiatives enhance both their educational experience and the broader mission of patient-centered academic medicine. In the transformative era of higher education, early integration of clinical content into preclinical curricula represents a key opportunity to foster curiosity, critical thinking, and research competencies in future physicians. By participating in authentic surgical research projects, students are exposed to real clinical problems that deepen their understanding of preclinical subjects while simultaneously developing methodological skills such as data collection, statistical analysis, and evidence-based reasoning. Our institutional experience shows that early involvement in surgical research strengthens professional identity formation, encourages collaboration within academic teams, and promotes ethical awareness, thereby narrowing the traditional gap between theoretical learning and clinical practice. Moreover, student-led contributions to research stimulate innovation, improve motivation for lifelong learning, and cultivate resilience in facing the challenges of modern healthcare systems. The presentation will share examples of how structured mentorship, integration into ongoing surgical studies, and support from academic and clinical staff have enabled undergraduates to produce meaningful scientific outputs while gaining valuable competencies for their future careers. Ultimately, engaging medical students in clinical research at an early stage does not only benefit their personal and professional growth, but also advances the transformative agenda of higher education by aligning surgical education with inquiry-driven, collaborative, and patient-centered practice.

Keywords: Curriculum; Medical Students; Patient-Centered Care; Research; Surgical Procedures; Undergraduate Medical Education

HEALTH LITERACY: A FUNDAMENTAL COMPETENCY IN COMMUNICATION WITH PATIENTS

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Health literacy represents a crucial yet often underestimated determinant of effective healthcare delivery and patient outcomes. Defined as the ability of individuals to obtain, understand, and use health information for informed decision-making, health literacy forms the foundation of patient-centred communication and shared decision processes. Low levels of health literacy are strongly associated with poorer health outcomes, reduced adherence to therapy, increased hospitalisation rates, and higher healthcare costs. Conversely, enhancing health literacy improves patients' self-management capacities, strengthens trust between patients and healthcare professionals, and promotes equity in access to care. In modern health systems characterised by complexity, digitalisation, and growing multimorbidity, communication competence among healthcare providers becomes indispensable. This presentation aims to highlight the pivotal role of health literacy as a professional competency and to present practical strategies for integrating health literacy principles into daily clinical communication. It will also emphasise educational approaches and institutional frameworks that support the development of a health-literate culture within healthcare organisations. Developing health literacy-sensitive communication requires a multidisciplinary approach that integrates medical education, public health, and social sciences. Training programs should emphasise plain language, cultural competence, and the use of teach-back methods and visual aids to ensure comprehension. Institutional strategies—such as creating "health-literate organisations"—enable the alignment of communication practices with patients' literacy levels. Furthermore, the digital transformation of healthcare highlights the importance of eHealth literacy, which encompasses the ability to navigate, evaluate, and apply digital health information safely and effectively. Policymakers and healthcare leaders must recognise health literacy as a systemic quality indicator and embed it within national health strategies. Improving health literacy is not merely a patient's responsibility, but a shared societal obligation that requires coordinated efforts across the health sector, education, and community networks. Strengthening communication competencies and fostering an environment where information is accessible, comprehensible, and actionable will lead to safer, more equitable, and more effective healthcare delivery.

Keywords: Communication; Health Education; Health Equity; Health Literacy; Health Personnel; Patient-Centered Care

HEALTH LITERACY AS A FOUNDATION FOR HEALTH EQUITY: BRIDGING GAPS IN ACCESS AND UNDERSTANDING

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Health literacy is a critical determinant of individual and population health. It encompasses the cognitive and social skills necessary to access, comprehend, assess, and apply health information to make informed decisions regarding individual health. It also covers the abilities required for preserving and promoting health, managing diseases appropriately, and using healthcare services effectively. Low levels of health literacy are strongly associated with health disparities, reduced use of preventive services, poorer disease management, and increased hospitalizations. This lecture aims to highlight health literacy as a fundamental key factor for achieving health equity, focusing on its role in empowering individuals and communities, reducing social health inequalities, and enhancing the effectiveness of health systems. The presentation will review dimensions of health literacy, explore the current evidence on its distribution and impact across different sociodemographic groups, and examine strategies for improving health literacy through intersectoral collaboration, education, and digital tools. Particular attention will be given to vulnerable populations and barriers they face in accessing, understanding, and using health information. Effective approaches to strengthening health literacy include integrating it into school curricula, providing community-based and workplace education, training health professionals in clear communication, and developing user-friendly digital resources. Public health, as a discipline, plays a pivotal role in advancing health literacy at the population level, thereby influencing health outcomes and promoting equity. This priority has also been recognized globally, with organizations such as the World Health Organization and the European Union emphasizing health literacy as a cornerstone of sustainable health systems and health equity policies. Furthermore, communication skills among healthcare professionals are of equal importance to clinical skills, as effective communication has been shown to significantly impact health outcomes. It is also important to address the responsibility of health professionals and institutions in recognizing and responding to varying health literacy levels among patients and the public. By promoting health literacy, we not only improve individual outcomes but also strengthen public health resilience and social justice.

Keywords: Health Equity; Health Literacy; Patient Education; Public Health; Social Determinants of Health

TEACHING HEALTH LITERACY AS A CLINICAL SKILL: PREPARING FUTURE HEALTHCARE PROFESSIONALS FOR PATIENT-CENTRED PRACTICE

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Aim: Health literacy (HL) is an essential clinical component of health outcomes, directly affecting patient safety and adherence. Pharmacists are well positioned to improve health literacy trough patient education and counselling. This pilot study aimed to explore HL as a fundamental clinical competency in pharmacy education and to assess the level of awareness, attitudes, and perceived responsibility regarding HL among undergraduate pharmacy students.
Materials and Methods: A cross-sectional study was conducted with 70 students from the University of Josip Juraj Strossmayer in Osijek, Study of Pharmacy. These students were in their first (n = 37), second (n = 14), and third (n = 19) years of study. Participants completed a 14-item questionnaire that used a 5-point Likert scale to measuring students' understanding of HL, confidence in information appraisal and perceived professional responsibility. The data were analysed descriptively and via principal component analysis (PCA), employing parallel analysis and Varimax rotation to investigate underlying components.
Results: The average self-reported ability to understand healthcare instructions was high (M=4.43), but the average confidence in judging online health information was only moderate (M=3.40). Students found it somewhat challenging to understand medicine leaflets (M=2.37), but they strongly agreed that pictograms and brief messages help patients understand (M=4.21). Most students acknowledged health literacy (HL) as a crucial component of clinical practice (M = 4.81) and recognised their professional obligation in patient education (M = 4.61). PCA identified one main component, Health Literacy Orientation, which explained 25.6% of the total variance and showed general HL awareness and competence. Exploratory two- and three-component models indicated subdomains related to Functional–Critical Health Literacy Skills and Professional Responsibility towards Health Literacy, collectively accounting for 46% of the variance.
Conclusion: Pharmacy students demonstrated a strong awareness of HL and recognise its importance for patient-centred care. These findings highlight both the practical and ethical dimensions of HL, in consistent with modern educational paradigms emphasizing communication, digital health literacy, and interprofessional learning. This aligns with international perspectives positioning HL as individual and organisational responsibility. The tool provides a foundation for integrating HL into pharmacy programs designed to enhance communication, ensure safe medication use, and improve public health outcomes.

Keywords: Curriculum Development; Health Literacy; Patient-Centred Care; Pharmacy Education; Professional Competence

DIGITAL HEALTH LITERACY IN THE INFORMATION AGE: OPPORTUNITIES AND CHALLENGES

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In recent decades, societal complexity has increased dramatically. With the advent of the digital age, access to information has become virtually unlimited, especially in the field of medicine. Yet the ability of individuals to critically evaluate, process, and apply this abundance of information has not advanced at the same pace. Consequently, one of the central challenges for modern physicians is not merely to deliver medical information, but to communicate it in a way that patients can understand, internalize, and use meaningfully. This concept, known as *health literacy*, is fundamental for building trust in the physician–patient relationship, fostering comprehension of medical conditions, and ensuring adherence to therapy. In this lecture, I will provide an overview of the challenges and opportunities associated with promoting health literacy, particularly in the digital era. Drawing on examples from my clinical practice in metabolic disease, I will highlight practical strategies for improving patient engagement and comprehension. Finally, I will highlight how integrating health literacy into the education of both medical students and patients is cornerstone of effective healthcare.

Keywords: Communication; Health Literacy; Medical Education; Physician-Patient Relations

EDUCATIONAL NEEDS ON SELF-MEDICATION DURING HEALTHCARE STUDIES – INSIGHTS AND IMPLICATIONS FROM OVERIVEW OF HEALTHCARE PROFESSIONALS' AND STUDENTS' BEHAVIORS

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The assessment of current evidence on self-medication among healthcare professionals (HCPs) and healthcare students was performed with the aim to identify educational needs that should be addressed during university training. A narrative review of international literature was conducted, focusing on the prevalence, patterns, and risks of self-medication among HCPs and students. Special attention was given to studies reporting antibiotic and psychotropic drug use, and to publications discussing educational interventions targeting responsible self-medication. Evidence indicates alarmingly high prevalence rates: over 90% of respondents in some studies reported practicing self-medication in general, and more than 50% reported antibiotic self-medication. Such practices carry significant risks, including masking of symptoms, drug interactions, delayed diagnosis, and contribution to antimicrobial resistance. Despite these risks, most healthcare curricula do not provide systematic education on self-medication. This literature review highlights key educational needs: raising awareness of risks and benefits; improving recognition of underlying patient self-medication; strengthening counselling on safe drug use; developing skills for medication management, including deprescribing when necessary; and ensuring effective communication with patients. Self-medication is highly prevalent among HCPs and healthcare students, yet formal education on this issue remains limited and non-standardized. Introducing structured training on responsible self-medication early in medical, pharmacy, dental, and nursing programs could improve the knowledge, attitudes, and practices of future professionals. This would promote safer self-care, enhance patient safety, and support more sustainable healthcare systems.

Keywords: Drugs; Education; Healthcare Professionals; Patient Safety; Self-Medication

ANALYZING PATIENT EDUCATION IN CROATIA AND AMERICA

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Patient education is broadly accepted as a necessary tool to improve health outcomes, self-management, and medication adherence. However, there are still issues surrounding the practice of patient education, and further research is needed on verbal versus written education, and on how to tailor education to a patient's specific literacy and cultural context.[1,2] By analyzing hospitals in the United States of America and in Croatia, this review and presentation aims to illustrate and compare patient education in two different healthcare systems, outline benefits and shortcomings of each system, and clarify further research opportunities. This will be accomplished through the examination of case reports from the Hospital for Special Surgery (HSS) in New York City, Harborview Medical Center in Seattle, and the Hospital of Obstetrics and Gynecology in Zagreb. These three institutions all provide expert care to their communities while aiming to adequately inform patients of their ailments. Some common strengths of patient education noted in each of these three institutions include: physicians clearly explaining procedures and recovery in advance, and a strong willingness to listen to patients. To mention just a few shortcomings: in the New York City HSS Spine Surgery Department, the core issue blocking adequate patient education was the short appointment time. The Neurosurgery Clinic at Harborview's main problem in patient education was the speed at which surgeons explained different pathologies and the challenging professional verbiage used. Furthermore, patients would occasionally hear contradictory statements from fellow and attending surgeons. In the Hospital of Obstetrics and Gynecology in Zagreb, hospital personnel expressed different priorities, which could lead to patients feeling inundated and confused. These three hospitals, in two different countries with two different healthcare systems, share similar problems in patient education. The key issues are that (1) patients may receive information from many different healthcare providers, who (2) tend to overwhelm patients with information, and who (3) sometimes use technical terminology, confusing many patients. Future research should assess which forms of communication lead to the best patient understanding, identify a streamlined approach so patients receive information from 1-2 key stakeholders, and train medical personnel to speak colloquially with all patients.

Keywords: Delivery Of Health Care; Education; Hospitals; Literacy; Patients

PATIENT EDUCATION PATHWAYS IN LIVER TRANSPLANTATION: IMPLEMENTATION EXPERIENCE AT UNIVERSITY HOSPITAL CENTRE ZAGREB

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Aim: The aim of this project was to design, implement, and evaluate a comprehensive patient education pathway in liver transplantation (LT) that would improve patients' understanding of the transplant process, enhance adherence to therapy, and strengthen psychosocial readiness for surgery and recovery.

Materials and Methods: A multidisciplinary team at the University Hospital Centre Zagreb, including hepatologists, transplant surgeons, anesthesiologists, nurses, and pharmacists, collaborated with the Croatian Rare Liver Foundation to develop an educational booklet titled "Liver Transplantation - A Guide for Patients and Family Members" (2025). The content was created through an iterative process involving patient and family members interviews, expert input, and analysis of common informational gaps identified in clinical practice. The booklet provided step-by-step explanations of the transplant journey; from pre-transplant evaluation and surgical preparation to postoperative recovery and long-term self-management and it is supported by practical advice, lifestyle recommendations, and psychological coping strategies. Educational materials were distributed to patients and family members and integrated into structured consultations during evaluation and follow-up.

Results: Preliminary evaluation, based on clinician feedback, revealed that patients exposed to the educational pathway reported greater understanding of medical procedures, increased confidence in managing medication regimens, and reduced anxiety while waiting for LT. Family members expressed higher levels of preparedness and involvement in postoperative care, while healthcare professionals observed improved communication, adherence, and patient engagement.

Conclusions: The implementation of a patient-centred educational pathway enhanced health literacy, safety, and psychological resilience among LT recipients and their families. The UHC Zagreb model demonstrates that multidisciplinary, patient-centred education, co-created with patients and families, can improve outcomes and should be integrated as a formal component of medical education and transplant care training programmes.

Keywords: Health Literacy; Liver Transplantation; Multidisciplinary Team; Patient Education; Postoperative Care

THE INDIVIDUAL AS A MANAGER OF THEIR OWN HEALTH: PUBLIC HEALTH CAMPAIGNS, ACTIONS, PRIORITIES AND PROGRAMS IN THE SERVICE OF HEALTH EDUCATION

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Reflecting on medical education from the perspectives of both students and teachers, and on their mutual interactions, it becomes evident that the ultimate goal of the educational process is to achieve effective communication with patients — for “first comes the word, then the medicine”. When considering this, it is essential to recognize the differences between clinical and non-clinical settings. One of the most notable distinctions between public health and clinical practice is the shift from the traditional “one-on-one” relationship, which still dominates throughout medical education, toward a “one-to-many” approach characteristic of public health. In this context, the patient is the entire population, and the workplace of a public health specialist — as Andrija Štampar emphasized — is “where people live, not in the office.” Physicians should therefore act as “teachers of the people”, “preparing communities for a proper understanding of health issues”. By analysing Štampar’s ten public health postulates from the perspective of modern public health medicine, it becomes clear that they remain timeless and highly applicable today. These postulates are illustrated through practical examples of recognizable public health campaigns, actions, priorities, and programs, with a particular emphasis on those identified in the Plan for Health of Primorje-Gorski Kotar County within the “Healthy County” project, as well as recent media-based public health campaigns. Special attention is given to the social media presence of the Teaching Institute of Public Health of the Primorje-Gorski Kotar County and the importance of translating medical information into a language understandable to the general public. All examples share a common denominator — the promotion of health and education of citizens about the importance of disease prevention. Every individual should possess an adequate level of health literacy to become the best manager of their own health, while students, healthcare professionals, and educators alike should serve as true ambassadors of health.

Keywords: Education; Health Literacy; Health Promotion; Prevention; Public Health

Workshop

THE ART OF UNDERSTANDING: EXPLORING COMMUNICATION AND LITERACY IN PRIMARY CARE

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The Student Section for Public Health focuses on promoting health and empowering individuals through public health actions and initiatives**.** One of its key missions is to assess and promote health literacy, defined as ability of individual to gain access to, understand and use information in ways which promote and maintain good health. It is not only personal competence: higher levels of health literacy has beneficial effect on social, economic and environmental determinants of health for the entire population. The results show that the average level of health literacy in Croatia is on the borderline between problematic and adequate. This highlights the importance of comprehensive communication between physicians and patients to ensure optimal healthcare outcomes. The workshop focuses on strengthening mutual understanding and communication between physicians and patients. According to best-practice guidelines, the main objective is to apply the "teach-back" method, a communication technique used to confirm that patients truly understand the information provided. The workshop will include several structured scenarios, representing different clinical situations: chronic disease management, medication adherence, and lifestyle modification. Through these simulated cases, participants will engage in practical exercises that reflect real-world situations, highlighting common challenges in physician–patient communication. Each scenario will encourage participants to identify bounderies to effective dialogue and explore strategies to overcoming them. During the workshop participants will gain experience in how structured conversation and good preparation can improve patient adherence, strenghten patient-physician relationship and improve clinical outcomes and overall wellbeing. Emphasizing interdisciplinary collaboration, the workshop is intended for all current and future healthcare professionals involved in patient care; including physicians, students, and other healthcare workers. By fostering clear, empathetic, and tailored communication, healthcare professionals can build trust, enhance patient adherence, and contribute to better clinical outcomes and overall well-being. In addition, proficient communication and understanding of health literacy are fundamental elements of high- quality healthcare and remain central objectives within clinical practice and public health initiatives.

Keywords: Communication; Health Literacy; Public Health

INTEGRATING THE CROATIAN QUALIFICATIONS FRAMEWORK INTO PHARMACY STUDIES: LESSONS LEARNED AND DIRECTIONS FORWARD

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The PharmMedQ project (Application of the Croatian Qualifications Framework in Improving Study Programs in Pharmacy and Medical Biochemistry) aimed to modernize pharmacy education in Croatia by applying the Croatian Qualifications Framework (CROQF) to better connect academic outcomes with labor-market needs and contemporary professional competencies. Funded by the European Social Fund and led by the University of Zagreb Faculty of Pharmacy and Biochemistry, with the University of Split School of Medicine and the Institute for the Development of Education as partners, the project was conducted during the Covid-19 pandemic (2019–2023). PharmMedQ comprised three phases: (1) development of occupational standards Pharmacist and Industrial Pharmacist, (2) development of the qualification standard Master of Pharmacy, and (3) curriculum revision. Nearly 100 experts from community and hospital pharmacies, the pharmaceutical industry, regulatory bodies, and academia collaborated to identify key professional tasks and related competencies. The resulting occupational standards Pharmacists and Industrial Pharmacists defined 15 and 11 key tasks, each supported by 13 competency sets. Based on these, the Master of Pharmacy qualification standard established 85 learning outcomes sets (41 mandatory, 44 elective), of which mandatory outcomes are required for all Croatian pharmacy programs. All standards were approved by the relevant national bodies and included in the CROQF Register. Application of the new qualification standard led to substantial modernization of the Pharmacy programme at Faculty of Pharmacy and Biochemistry. Several new mandatory courses were introduced: Digital Pharmacy, Industrial Pharmacy, Phytotherapy, Instrumental Techniques, Micronutrition, Basics of Pharmacy Management and Health Legislation. Existing key courses—Pharmaceutical Chemistry, Drug Metabolism, and Clinical Pharmacy with Pharmacotherapy—were reorganized to enhance integration and outcomes. The Pharmacy Practice course was expanded into four stages throughout the five-year program, ensuring continuous experience in community, hospital, and industrial pharmacy settings.

Keywords: Croatian Qualifications Framework; Curriculum Revision; Occupational Standards; Qualification Standard

CROATIAN PHARMACY COMPETENCY FRAMEWORK – STRUCTURED PROFESSIONAL DEVELOPMENT TAILORED TO INDIVIDUAL NEEDS

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In today's healthcare system, pharmacists play an increasingly important role in safeguarding patient health and safety, which requires continuous professional development based on clearly defined competencies. The Croatian Pharmacy Competency Framework (HLJKO) was developed in response to the need for a structured, individualized approach to pharmacists' professional growth, tailored to the specific national context. It is based on the Pharmaceutical Competency Framework of the International Pharmaceutical Federation (FIP Global Competency Framework), adapted to Croatian legislative, educational, and professional standards. HLKO encompasses four core competency domains: professional knowledge and skills, management and organization, communication and collaboration, and personal development. Each domain is divided into competency clusters that allow for assessment of current competency levels and targeted development planning. The framework serves as a tool for self-assessment, mentoring, educational planning, and progress tracking, and is applicable across all career stages—from internship to advanced professional roles. Every organized educational activity accredited by the Croatian Chamber of Pharmacists must be aligned with HLJKO and clearly state the intended learning outcomes and competencies to be developed. This ensures content relevance, transparency of objectives, and responsiveness to the actual needs of the profession. Educators are encouraged to define learning outcomes according to the competency clusters, enabling precise monitoring of the impact of education on individual professional development. This approach contributes to the standardization of continuing education and facilitates the evaluation of acquired knowledge and skills. HLJKO empowers pharmacists to identify their own development needs, direct their learning activities, and actively shape their professional journey. It also provides a foundation for national quality standards, competency evaluation, and strategic workforce planning in pharmacy. The lecture will present the structure of HLJKO, its application in professional development, and opportunities for further integration into educational and professional systems. The aim is to encourage discussion on the importance of a competency-based approach in medical education, with a particular focus on the pharmacy profession.

Keywords: Competency-Based Education; Continuing Education; Pharmaceutical Services; Pharmacy Education; Professional Competence

THE EDUCATIONAL PLATFORM OF THE CROATIAN CHAMBER OF PHARMACISTS – A MECHANISM FOR THE STRUCTURED GUIDANCE OF PHARMACISTS' KNOWLEDGE DEVELOPMENT IN THE REPUBLIC OF CROATIA

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This presentation showcases the educational platform of the Croatian Chamber of Pharmacists as a key mechanism for the structured development, guidance, and governance of pharmacists' knowledge across the Republic of Croatia. Pharmacists' continuing professional development encompasses structured education, as well as theoretical and practical training based on up-to-date professional and scientific knowledge in the fields of pharmacy and healthcare. Its goal is to maintain and enhance the competencies of licensed pharmacists in accordance with the demands of modern pharmaceutical practice. The educational platform is more than just a learning portal — it is a strategic national tool designed to support lifelong learning and competence-based education. Fully aligned with the Croatian Pharmacy Competency Framework (HLJKO), the platform facilitates systematic monitoring of individual progress and targeted development through accredited e-learning modules, webinars, and specialized content. By providing standardized and transparent access to continuing education, the platform supports knowledge currency, ensures the applicability of learning to real-life professional contexts, and responds dynamically to public health needs and legal obligations. It promotes professional self-assessment and reflection, fosters quality assurance, and enables pharmacists to pursue personalized learning pathways. As such, the platform stands as a cornerstone of Croatia's efforts to develop a competent, adaptable, and forward-looking pharmaceutical workforce — and as a strong example of how professional chambers can lead effective knowledge management in healthcare systems.

Keywords: Croatian Chamber of Pharmacists; Croatian Pharmacy Competency Framework; Pharmacy Education

THE PHARMACIST OF THE FUTURE: EDUCATION IN THE AGE OF AI

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Artificial Intelligence (AI) is increasingly recognized as a catalyst for transforming pharmacy education, enhancing engagement, critical thinking, and readiness for technology-driven healthcare worldwide. Globally, AI supports clinical reasoning and communication through virtual simulations and case-based learning. It enhances personalized study by generating summaries and self-assessment tools while assisting students in academic and career preparation. Responsible and ethical AI use is essential, as learners must recognize bias, verify accuracy, and maintain integrity. In the United States, AI use in skills-based courses remains limited—only 18% of pharmacy schools report current application, mainly through gamification or digital simulation. Still, almost 60% of faculty plan to adopt AI within two years, reflecting growing interest despite barriers such as limited expertise, resources, and uncertainty regarding AI's specific educational role. In Europe, enthusiasm for AI is paired with structured policy and educational reform. The International Pharmaceutical Federation (FIP) reported the highest engagement in Europe, though formal AI training remains limited. The European Association of Faculties of Pharmacy (EAFP) promotes integration of digital health competencies, while the EU's AI Act emphasizes transparency and accountability in healthcare applications. Several universities illustrate practical innovation: Utrecht University (Netherlands) developed a Digital Pharmaceutical Care course addressing AI and ethics; the Complutense University of Madrid (Spain) integrates digital therapeutics into postgraduate study; RCSI (Ireland) applies telemedicine-based interprofessional learning; and Lausanne–Geneva (Switzerland) includes "expert patients" in discussions on digital ethics. Although familiarity with advanced AI tools remains uneven, both United States of America and European institutions acknowledge that future pharmacists must possess data literacy, ethical awareness, and critical evaluation skills. These competencies are essential for ensuring that AI complements—rather than replaces—human expertise in patient-centered pharmaceutical care.

Keywords: Artificial Intelligence; Clinical Competence; Curriculum; Digital Health; Ethics; Pharmacy Education

FROM MEMORIZATION TO CLINICAL REASONING: TRANSFORMING PHARMACOLOGY EDUCATION THROUGH AI AND CASE-BASED LEARNING

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The aim is to explore innovative teaching methods that move pharmacology education beyond rote memorization toward the development of clinical reasoning and safe prescribing skills, as well as to present students' perception of the integration of artificial intelligence (AI) and interactive learning tools into the Pharmacology course. Pharmacology remains one of the most conceptually challenging subjects in medical education, often perceived by students as abstract and disconnected from clinical practice. The shift toward competency-based learning requires new approaches that promote understanding of drug mechanisms within the context of real-life therapeutic decision-making. This lecture presents a blended educational model that combines AI-supported learning platforms with case-based and problem-solving sessions designed to improve student engagement and prescribing competence. Through the use of AI-driven adaptive quizzes, virtual patient simulations, and scenario-based discussions, students can receive personalized feedback and dynamically adjust their learning paths according to performance and comprehension. These methods not only foster critical thinking and clinical application of pharmacological principles but also address the learning preferences of Generation Z students who value interactivity and immediate feedback. Preliminary feedback from student cohorts shows increased motivation, improved retention of pharmacological mechanisms, and higher confidence in clinical decision-making compared to traditional didactic teaching. The implementation of AI-assisted tools within pharmacology courses demonstrates how digital transformation can empower educators to teach safe, evidence-based prescribing while preparing future healthcare professionals for an increasingly data-driven clinical environment.

Keywords: Artificial Intelligence; Case-Based Learning; Digital Transformation; Medical Education; Pharmacology Education; Prescribing

EXPLORING THE USE AND PERCEPTIONS OF GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS AMONG UNIVERSITY OF ZAGREB FACULTY OF PHARMACY AND BIOCHEMISTRY STUDENTS

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Aim: Artificial intelligence (AI) tools are rapidly integrated into higher education, yet how students perceive and engage with them is scarcely explored. This study aimed to examine the familiarity, frequency and purposes of AI tool use, as well as ethical attitudes and preferences for institutional guidance among pharmacy and medical biochemistry students at the University of Zagreb Faculty of Pharmacy and Biochemistry.

Materials and methods: A cross-sectional anonymous online survey was conducted in March 2025 and offered to all pharmacy and medical biochemistry students. The questionnaire included demographics, familiarity with AI, tools and purposes of use, ethical perspectives, experiences with misuse, and opinions on guidelines. Data were analysed descriptively.

Results: Of 261 respondents (83% pharmacy, 17% medical biochemistry), almost all (95%) had used AI tools, with ChatGPT cited by 98% of users and a few mentioning alternatives such as Gemini, Copilot, or DeepSeek. The main purposes of use were studying (92%), interpreting scientific materials (44%), and preparing presentations (33%), while one-quarter reported using AI for writing seminar papers. Approximately one-third used AI several times per week, and 15% reported daily use. Most students (67%) considered responsible AI use ethical, whereas only 3% viewed it as cheating; however, 9% admitted to unfair use, and 42% knew peers who had done so. Nearly half were unsure of teachers' attitudes toward AI, reflecting a lack of clear institutional policies. A majority (59%) supported the introduction of formal faculty guidelines, and qualitative comments highlighted the need for training on responsible AI use and clarification of acceptable practices.

Conclusions: These findings indicate that AI, particularly ChatGPT, is deeply embedded in students' study routines. It is valued mainly for learning support but accompanied by uncertainty about ethical boundaries. To harness its educational benefits while preserving integrity, pharmacy and medical biochemistry schools should integrate AI literacy and ethics into curricula and establish transparent policies defining appropriate academic use. In May 2025, the Faculty of Pharmacy and Biochemistry adopted an AI Policy, becoming the second constituent unit of the University of Zagreb to do so.

Keywords: Artificial Intelligence; Medical Biochemistry Education; Pharmacy Education; Professional Ethics

PHARMACIST-LED EDUCATION IN LIVER TRANSPLANTATION AT UHC ZAGREB: A MODEL FOR OPTIMIZING MEDICATION SAFETY AND ADHERENCE

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The clinical pharmacists, as an integral members of the liver transplant multidisciplinary team at University Hospital Centre Zagreb (UHC Zagreb), play a key role in the individualization and optimization of immunosuppressive and supportive therapy, patient education and promotion of adherence. Their responsibilities encompass the selection and adjustment of immunosuppressive agents based on patient-specific characteristics, including clinical presentation, laboratory findings, therapeutic drug monitoring, and other pertinent clinical parameters, monitoring for drug–drug interactions and adverse effects, ensuring safe and effective dosing regimens. Given that most patients present with multiple comorbidities managed simultaneously by different specialists, clinical pharmacists are responsible for conducting medication reconciliation both at hospital admission and at discharge following liver transplantation. This process focuses on the identification and prevention of therapeutic duplications, omissions, and potential drug–drug interactions. In the outpatient setting, pharmacists continue to monitor and adjust pharmacotherapy to ensure consistency and therapy optimization. Clinical pharmacists play an active role in patient care throughout the post-transplant hospitalization period and during subsequent outpatient follow-ups. Within the framework of Comprehensive Medication Management (CMM), the clinical pharmacist performs a structured four-step process comprising: (1) initial patient assessment, (2) evaluation of medication therapy, (3) development of a care plan accompanied by patient education, and (4) follow-up monitoring. The process aims to ensure that each prescribed medication is appropriate,effective and safe for the specific patient. Importantly, the clinical pharmacist responsible for CMM conducts a comprehensive review of all medications used by the patient, including prescription and non-prescription drugs, herbal products, and dietary supplements. Patient education is a crucial component of this process. It consists of counseling on the importance of strict adherence to prescribed therapy, correct timing and administration of medications, and regular monitoring of key clinical parameters such as blood pressure, blood glucose, and liver function. Additionally, patients receive guidance on diet and lifestyle modifications to support long-term graft function and overall health. Through implementation of continuous collaboration with other members of the liver team, the clinical pharmacist ensures safe, effective, and individualized therapy, contributing significantly to improved patient outcomes and long-term success of transplantation.

Keywords: Clinical pharmacist; Drug therapy; Liver transplantation; Medication adherence

SELF-MEDICATION PRACTICES IN HOUSEHOLDS OF MEDICAL STUDENTS AT THE UNIVERSITY OF RIJEKA

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Aim: To assess drug storage habits, self-medication practices, and the contents of home pharmacies in the households of medical students at the Faculty of Medicine, University of Rijeka, in 2024.
Methods: A cross-sectional study included 45 third-year medical students, who interviewed their household members about self-medication and listed the medicines stored at home.
Results: Of the participants, 66.7% were female. Healthcare professionals were present in 24.4% of households, including 20% with medical doctors, while the remainder were pharmacists or nurses. In 66.7% of households, medicines were stored in a designated location ("home pharmacy"), while only one household reported having no medications at all. Expired medicines were found in 44.4% of households. Drugs were not accessible to children under 14 years. Lists of stored medicines were obtained from 39 households (86.7%). Analgesics and antipyretics were present in 94.9% of households and were self-medicated at least occassionally in 89.2% of them. These were followed by topical dermatological products (30.8% of households; self-medicated in 83.3%) and cough and cold preparations (28.2%; self-medicated in 90.9%). Antibiotics were found in 15.4% of households and were self-medicated in 66.7%, while anxiolytics were present in 7.7% and self-medicated in 33.3%.
Conclusion: Self-medication and home drug storage are common among households of medical students at the Faculty of Medicine, University of Rijeka, with analgesics and antipyretics being the most frequently used. These findings emphasise the importance of addressing self-medication during medical education to increase awareness, ensure safe practices, and reduce the risks of inappropriate medicine use.

Keywords: Medical Students; Medicines; Self-Medication

MENTORSHIP MATTERS: A CROSS-SECTIONAL STUDY OF SPECIALTY CHOICE IN FINAL-YEAR MEDICAL STUDENTS

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Aim: This study aimed to examine the specialty preferences of final-year medical students at the University of Zagreb School of Medicine and to explore how teaching staff, mentorship, and clinical experiences influence these choices.
Materials and Methods: We conducted a cross-sectional survey among sixth-year students at the University of Zagreb School of Medicine. An electronic questionnaire collected data on demographics, current top three specialty preferences and first choice from years three to six, as well as nine attitude items rated on five-point scales (work–life balance, anticipated salary, influence of experiences during clinical rotations, understanding of daily specialty work, openness to changing preferences, quality of staff interactions, avoidance due to negative atmosphere, perceived influence of staff behavior, and confidence in one's choice). Descriptive statistics summarized specialty preferences and reasons for change. Multivariable models were used to examine associations between attitudes and first-choice specialties.
Results: Of 272 eligible sixth-year students, 118 completed the survey (response rate 43.4%). Most respondents were female (73.7%). From years three to five, interest in gynecology and otorhinolaryngology increased, cardiology declined from an early peak, and family medicine gained prominence by graduation. In the sixth year, the most frequently mentioned specialties across the top three choices were family medicine (26), endocrinology (23), gynecology and obstetrics (22), pediatrics (18), otorhinolaryngology (16), radiology (15), ophthalmology (15), cardiology (13), dermatology (11), and anesthesiology (11). In multivariable analyses, higher perceived influence of staff behavior was associated with selecting cardiology and endocrinology, and higher confidence related to greater likelihood of choosing a surgical field. Students most often cited clinical experience, interpersonal dynamics and atmosphere, lifestyle considerations, burnout concerns, and mentorship as reasons for changing their first choice.
Conclusions: The findings indicate that the clinical learning environment is a key determinant of specialty choice. Prioritizing high-quality clinical exposure and mentorship in shortage specialties such as family medicine, pediatrics, and gynecology—particularly in underserved settings—is likely to yield the greatest benefit.

Keywords: Career Choice; Health Workforce; Medical Faculty; Medical Students; Preceptorship

Session C21. TIME FOR DEVELOPING INTERNATIONAL COMPETENCIES

TRANSPLANT MEDICINE WITHOUT BORDERS: THE UEMS TRANSPLANT MEDICINE BOARD'S EFFORTS TO STANDARDIZE TRAINING AND PRACTICE

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The presentation introduces the mission, structure, and educational initiatives of the European Board of Transplant Medicine (EBTM) within the UEMS Section of Surgery, highlighting its role in fostering excellence and harmonization in transplant medicine training across Europe and beyond. Transplant medicine is one of the most multidisciplinary and rapidly evolving fields, integrating surgical, medical, and scientific expertise. To ensure uniform educational standards and quality of patient care, the UEMS established the EBTM in 2007 with the goal of promoting excellence in training, assessment, and continuous professional development of transplant physicians. The Board currently unites 17 representatives from 13 European countries and collaborates closely with the UEMS Section of Surgery and the European Society for Organ Transplantation (ESOT). Its core activity is the European Transplant Medicine Examination, an oral assessment covering modules in Common Trunk, Kidney, and Liver Transplantation for candidates with at least two years of formal transplant medicine training. The examination evaluates clinical reasoning and decision-making in Transplant Hepatology and Nephrology through open questions and interactive, case-based discussions. The Honorary Certificate will be discontinued by the end of 2026 to reinforce standardized assessment. Successful candidates are awarded the Fellow of the European Board of Transplant Medicine (FEBTM) certificate, a credential recognized throughout Europe. As of 2025, 147 physicians have earned this distinction. The EBTM is now modernizing its activities through preparatory courses, enhanced collaboration with transplant surgeons, and expansion of its Ambassadorship Program to strengthen visibility and engagement, particularly in countries outside the EU. Recognizing Transplant Hepatology and Nephrology as official subspecialties remains essential for ensuring professional identity, mobility, and consistent quality of care across Europe. Key goals include achieving this recognition and developing a system for accreditation of training centres. The Board promotes knowledge dissemination through monthly meetings, participation in major scientific congresses, and social media outreach. Through these ongoing educational efforts, the EBTM supports the development of highly skilled transplant physicians capable of delivering optimal patient care and advancing European and international transplant medicine.

Keywords: Harmonization; Medical Education; Transplant Medicine; UEMS

MEDICAL STUDIES IN ENGLISH: 22 YEARS OF INTERNATIONALISATION - LESSONS LEARNED, CHALLENGES TO OVERCOME

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The University of Zagreb School of Medicine has a long tradition of welcoming international students. This presentation aims to provide an overview of the Medical Studies in English programme at the University of Zagreb, School of Medicine. In the 1970s and 1980s, nearly 400 international students studied there, many from the Croatian diaspora. The English-language program was launched in 2003, following Croatia's post-war recovery and growing European integration. The School designed a six-year curriculum aligned with EU standards (over 5500 teaching hours, ECTS credits, electives). Innovations included new sixth-year courses (geriatrics and addiction medicine), integrated modules in neurology and infectious diseases, problem-based learning, and international knowledge assessments (MCAT and USMLE). The first cohort, mostly Croatian diaspora from North America, enrolled in 2003. Since then, the number of students has continued to grow steadily. Admission requires demanding exams in physics, chemistry, and biology. Competition is intense: on average, 400 applicants vied for 50 spots each year. By 2025, more than 466 physicians from 37 countries had graduated, with many diaspora students choosing to remain in Croatia, strengthening the national healthcare system. The program actively embraced the Bologna Process, gaining approval from the Ministry in 2005. Mobility and exchange were fostered through Erasmus and Erasmus+, with students arriving from more than 15 EU countries, the United States of America and Asia. The program also hosts guest lecturers, encouraging research cooperation, faculty exchange, and improving staff's language competence. In 2015, the English Studies received the prestigious CeQuInt Certificate from the European Consortium for Accreditation, recognising excellence in internationalisation—the first medical school in the EU to achieve this. Its success inspired other medical/biomedical schools at the Universities of Rijeka, Split and Osijek (including Dental Medicine and Veterinary Medicine in Zagreb) to introduce English programs. By academic year 2025/2026, 1108 students from over 40 countries were enrolled, making the program a cornerstone of Croatia's medical education and a contributor to global healthcare. Together with the Croatian Agency for Science and Higher Education, the University of Zagreb School of Medicine will seek recognition from the World Federation for Medical Education (WFME) at the national level and encourage enrolled students to pass the United States Medical Licensing Exam. Today, the Medical Studies in English serve as a hub of academic internationalisation, student and staff mobility, and global scientific collaboration.

Keywords: Medical Education; International Graduates; Internationalisation; Student Exchange; USMLE; WFME

THE IMPORTANCE AND ROLE OF NURSES IN THE EDUCATION OF FUTURE MEDICAL DOCTORS

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The aim is to present the importance and role of nurses in the education of future and young medical doctors, as well as the possibility of developing a joint curriculum for nursing and medical students. In Croatia, nurses are still not formally recognized as educators of medical doctors, although they are involved in informal education. To date, no research has been conducted on the role of nurses as educators of physicians. For nurses to participate in formal education in the future, it is essential that they possess a high level of knowledge and skills that can be transferred to doctors. In current practice, there is a clear need for interdisciplinary education, since it is well known that during formal training students do not acquire sufficient practical skills, which must instead be developed through additional learning opportunities. The World Federation for Medical Education recommended interprofessional education (IPE) 1988. Interprofessional education is a method of joint training of professionals to achieve a common goal. Learning opportunities that encourage interprofessional education and practice are still rare in our educational environment. Today, in some countries, interprofessional cooperation (IPC) or interprofessional education (IPE) for doctors and nurses is implemented, recognizing the importance of interdisciplinary education. Nurses educate doctors about different roles within the healthcare team, challenge stereotypes, and encourage mutual understanding and respect for the contributions of each profession. Most nurses believe they contribute to medical education—particularly in teaching technical procedures, medical documentation, clinical tasks related to medication, and other skills. The support nurses provide is in fact part of their “invisible work,” contributing to the hidden curriculum of medical and other health professions education.

Keywords: Education; Interprofessional Teamwork; Medical Doctor; Nurse

BUILDING COMPETENCE THROUGH MULTIDISCIPLINARY TEAM MEETINGS IN LIVER TRANSPLANTATION AT UNIVERSITY HOSPITAL CENTRE ZAGREB

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The aim of this presentation is to demonstrate how the structured implementation of multidisciplinary team (MDT) meetings has enhanced clinical competence, coordination, and educational value, leading to a substantial increase in the number of liver transplantations at the University Hospital Centre (UHC) Zagreb. Materials and Methods: Croatia has one of the highest organ donation and transplantation rates globally, and UHC Zagreb is the country's largest solid organ transplant centre, performing kidney, liver (adult and paediatric), heart, lung, and combined organ transplantations. The Liver Transplant Centre within UHC Zagreb was reorganized four years ago and formally established a structured MDT model including hepatologists, transplant surgeons, anesthesiologists, radiologists, pathologists, infectious disease specialists, microbiologists, transfusion medicine specialists, nurses, and clinical pharmacists. Weekly MDT meetings are dedicated to comprehensive patient evaluation, case prioritization, perioperative and postoperative management, and ethical decision-making, while developing professional growth through interprofessional education. A critical component of this process is the systematic recording of meeting minutes, which document decisions, rationale, and educational takeaways. These records are archived in a shared digital database and serve as an ongoing educational resource, ensuring knowledge transfer, transparency, and standardization of clinical practice. Results: Since the introduction of structured MDT decision-making and systematic documentation, the number of liver transplants performed at UHC Zagreb has increased markedly, from fewer than 10 procedures annually in the early 2010s to 25 in 2022, 32 in 2023, and 36 in 2024. The Centre currently performs approximately 35% of all national liver program. MDT implementation has improved coordination, efficiency, and patient outcomes, while meeting minutes have proven invaluable for ensuring consistency, quality assurance, and shared learning within the team. Conclusions: The UHC Zagreb Liver Transplant experience highlights that structured MDT meetings supported by documentation and interprofessional learning form a strong foundation for institutional growth. Multidisciplinary collaboration, continuous education, and traceable meeting records have led to sustained improvement in liver transplantation outcomes.

Keywords: Clinical Competence; Croatia; Interprofessional Education; Liver Transplantation; Meeting Minutes; Multidisciplinary Team; Patient Safety

EDUCATION IN MAMMOGRAPHIC POSITIONING AND INTERPRETATION OF MAMMOGRAMS

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The School of Principles of Mammographic Positioning and Interpretation of Mammograms at the Clinical Department of Diagnostic and Interventional Radiology, Clinical Hospital Centre (CHC) Rijeka, represents a national model of professional training and optimization of mammographic diagnostic procedure in Croatia. This structured program integrates theoretical and practical modules aimed at enhancing the skills of radiology professionals, thereby improving the accuracy, safety, and efficiency of breast cancer imaging. Proper breast positioning is essential for achieving diagnostic image quality, as incorrect positioning can lead to omitted glandular tissue, missed lesions, artifacts, repeat examinations, and increased absorbed dose delivered to the patient. Standard projections must include the maximum amount of glandular and subcutaneous tissue with adequate compression, which reduces breast thickness, mean glandular dose, and artifacts. Automated systems and artificial intelligence algorithms are highly sensitive to artifacts, further underscoring the need for high-quality acquisition. While breast compression remains critical for visualization and dose reduction, studies show that optimal compression force is not standardized, varying across institutions, devices, and technologists. Individualized compression tailored to patient comfort improves diagnostic quality without compromising image value. European guidelines emphasize quality control, continuous training, protocol implementation, feedback, and communication with patients. Training radiographers has a direct impact on image quality, while radiologists' targeted education strengthens interpretive accuracy. From 2018 to 2024, more than 200 professionals, including radiographers, radiologists, and other staff involved in breast cancer care, successfully completed the program, acquiring competencies in positioning, imaging methods, equipment use, and quality control. The steady increase in participants demonstrates strong professional motivation and recognition of the need for standardized practice. This initiative confirms that structured education not only enhances diagnostic accuracy and reduces technically inadequate images but also minimizes unnecessary dose to patient, strengthens professional expertise, and fosters multidisciplinary collaboration. The School of Mammographic Positioning and Interpretation of Mammograms at CHC Rijeka has grown into a nationally and internationally relevant model, integrating scientific advances, European guidelines, and national regulations, thereby supporting high-quality breast cancer diagnostics and patient safety.

Keywords: Breast Positioning; Diagnostic Quality; Mammography; Professional Education; Quality Control

HOW PREPARED ARE HEALTHCARE INSTITUTIONS IN THE REPUBLIC OF CROATIA FOR MEDICAL STUDENT VOLUNTEERING?

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Aim: To determine capacity and the level of readiness of Croatian healthcare institutions to include volunteering.

Materials and Methods: Mixed research approach was employed, which included conducting an online survey and interviews. The research was based on the community readiness model and on the quality standards of volunteer programs. The survey included 28.85% (N = 45) of public healthcare institutions, excluding pharmaceutical services and dental medicine. Interviews were conducted with the leadership of healthcare institutions that include volunteering (N = 10), employees of healthcare institutions that involve volunteering (N = 7), and individuals who volunteer in healthcare institutions (N = 10).

Results: The findings revealed that healthcare institutions are at the "Vague Awareness" level (the third out of nine levels of readiness), with the lowest score in the Resources dimension. The main direction for advancing to a higher level of readiness was identified as taking responsibility to incorporate volunteering as a resource within a healthcare institution, adopting the stance: "This is important. What can we do?" The average value for all the observed criteria to determine capacity to include volunteering, according to the quality standards of volunteer programs, is 1.85.

Conclusion: To strengthen the capacity of healthcare institutions to include medical student in volunteering, it is essential and of high priority to raise the level of readiness of healthcare institutions for involving volunteers to the highest level across all dimensions of readiness (resources, knowledge, leadership, and organizational climate). As part, it is necessary to improve the capacities of healthcare institutions for volunteering by aligning them with the quality standards of volunteer programs. Priority areas include: developing human resources within healthcare institutions who will be available full-time to coordinate volunteering; establishing an effective information system on volunteering for healthcare institutions; and raising awareness about the importance and potential of volunteering within the healthcare system and importance and potential of volunteering for the medical students.

Keywords: Health Facilities; Medical Students; Organizational Innovation; Program Development; Volunteerism

TEACHING DIVERSITY IN HEALTHCARE PROFESSIONS EDUCATION AT THE UNIVERSITY OF RIJEKA

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The concept of diversity competence enables the provision of healthcare tailored to the needs of the individual and develops insight and empathy into the patient's beliefs, values, experience and behaviour. Analysis of the curricula of higher education institutions of healthcare professions in Croatia showed that there is a lack of education aimed at developing diversity competences of future healthcare professionals. According the results of course curricula the emphasis on patients' rights and the importance of respect for integrity and autonomy, as well as the importance of communication skills, is noticeable, but the vulnerability of persons/groups exposed to social inequality is very generally mentioned. That absence is also indicated by a quantitative study on diversity competences of students conducted among students of healthcare professions at the University of Rijeka. Results showed limited coverage of cross-cultural aspects in clinical lectures, with being more prevalent in the nursing study programme than in medicine. Furthermore, according to the qualitative study among teachers at the Faculty of health studies and the Faculty of medicine in Rijeka on their experiences and obstacles to the development of diversity competences towards members of certain vulnerable groups in the healthcare system, it may be concluded that educators acknowledge the multidimensional nature of diversity, especially in the context of vulnerable groups, but their engagement with these themes is inconsistent and often dependent on individual values, personal motivation, or disciplinary norms. The results of research conducted among students and teachers at the University of Rijeka, as well as experiences in the field of higher education of health professions from neighboring Slovenia, which shares a similar cultural environment with Croatia and is faced with similar challenges in providing healthcare to minority groups, could serve as a good basis for the development of an education model in study programs for healthcare students at the University of Rijeka, but also beyond. As the first study program in which it was possible to implement the results of the aforementioned research and good practices in the creation of a new mandatory course "Health inequality" as part of the newly launched YUFE joint study "Urban inequality", which has been held at the University of Rijeka since this academic year and which will also be presented.

Keywords: Croatia; Diversity Competence; Health Education; Minority Groups

ESTABLISHING SUSTAINABLE EQUITY, DIVERSITY & INCLUSIVITY FRAMEWORKS IN ACADEMIA: BEST PRACTICES & INSTITUTIONAL STRATEGIES

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This short lecture explores the development and implementation of sustainable frameworks for equity, diversity, and inclusion (EDI) within higher education, using the University of Rijeka as a case study. As an integral component of the University's mission and institutional culture, EDI principles shape all dimensions of academic and administrative endeavors. The presentation will outline how EDI principles are systematically integrated into institutional strategies and operationalized through concrete initiatives, programs, and support mechanisms. It will also highlight examples of best practices that have contributed to creating a more inclusive and equitable academic environment. At the same time, the lecture will address the challenges inherent in maintaining momentum, measuring impact, and ensuring that EDI efforts remain embedded and sustainable within complex academic systems. Lessons learned from the University of Rijeka's experience may offer transferable insights for other institutions striving to build more inclusive and resilient academic communities.

Keywords: Diversity; Equity; Higher Education; Inclusion; Institutional Culture

THE ROLE AND SIGNIFICANCE OF HUMANITIES IN MEDICAL EDUCATION

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Medicine is a call, deeply rooted in fundamental human values. Medicine is not just a profession. Medicine is not just a science either. This is the self-evident truth present from the time of Hippocrates and the birth of western medicine, but also envisaged in the old traditional medical schools of India and China. Humanities in medicine, or so-called medical humanities have a distinguished role to bring out, present and analyze humanistic values in a way to show and remind of exquisite humanistic nature of medicine and medical sciences. Indisputably, ethics is a backbone of such enterprise, but the power of other humanities such as history and pedagogy could not be underestimated. On the example of several historical cases, we show that ethics, history and pedagogy are indispensable for medical education of new generations of medical workers in the sense of strengthening their humanistic core values which carry the significance and importance of medicine as such. In other words, we argue that to be a good human is a prerequisite for being a good physician. Role of humanities are exactly to uncover and discuss the ways of being more humane. In the context of medical humanities this can take even greater importance because of the direct need of caring for vulnerable groups (patients generally, but also children, elderly etc.). History (primarily historical cases) appears as a unique pool for the first-class ethical analysis in the framework of modern pedagogical tools and modalities. Thus, medical humanities and their improved implementation in medical curricula come up as an indispensable part of modern medical education.

Keywords: Education; History of Medicine; Medical Education; Medical Ethics; Medical Humanities; Values

MEDICAL ETHICS AS THE NUCLEUS OF THE CURRICULUM OF THE STUDY OF MEDICINE AND RELATED STUDIES

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Medical ethics is professional ethics and represents ethical theory and practice in medicine. As such, it encompasses all professional groups in healthcare and medicine. Medical ethics, by its existence as professional ethics, ensures the possession of moral values as basic indicators of the medical profession on which the relationship between the doctor and the patient, the relationship of all members of the healthcare team, as well as the relationship of healthcare professionals towards society as a whole, is based. Ethics is understood as a theory that regulates human behavior in order to protect certain social values. From an ethical point of view, human actions, deeds, and actions can be "morally good", "morally bad - evil" or "morally neutral". When approaching the profession of a doctor or other health care worker, the basic motive is, or at least should be, altruism - love for others, in which there must be no morally bad decisions. The basic condition for their absence is knowledge of "morally good" and "morally bad" in medicine, which is what medical ethics deals with in a scientific and professional sense. Ethical prerequisites for the quality implementation and organization of health care primarily relate to defining solutions with the aim of promoting social welfare in general as well as the welfare of the patient in order to reduce or alleviate the effects of medically caused harm. Resolving clinical ethical dilemmas in medicine includes the ability and ability to assess one set of risks in relation to another and the ability to balance competing moral values. Through the foundation of medical action, which is reflected in: preserving the inviolability of human life, and its prolongation, the quality of life and human dignity, and the fact that the doctor treats the patient, the disease even at the cost of his own life (the Hippocratic Oath), it is visible how many ethical moments are in the aforementioned guidelines. Accordingly, medical ethics is a component of numerous courses in medical studies as well as related faculties. The relationship between doctor and patient, doctor and colleague, and doctor in everyday work is becoming increasingly clear in medicine on the basis of moral issues, which results in: the necessity of making ethical decisions, competence and education, dealing with ethical conflicts and dilemmas in practice and their resolution, and representation in Ethics Committees. The starting point from which other items in medical ethics education at the university level arise is that all students of medicine, dentistry, biotechnology, sanitary engineering, dental hygiene, nursing, midwifery, and medical radiology engineers have the opportunity to systematically become familiar with the ethical problems of their future profession and occupation. The word systematically means understanding the nature of ethics and accepting the relationship between ethical theories and professional moral dilemmas. Universities, Medical faculties and Faculties of Dentistry, Biotechnology, and Health studies are the institutions that are most responsible for interpreting and practically implementing moral values and demonstrating the professional moral actions of future health workers.

Keywords: Clinical Ethical Dillemas; Education; Medical Ethics; Moral Values

THE IMPORTANCE OF EDUCATION IN THE FIELD OF QUALITY MANAGEMENT IN HEALTHCARE

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Healthcare quality management requires skilled human resources. Pre-service education may not equip health and non-health professionals with the specialized competences needed for healthcare quality management. As a result, they require more education and training to acquire these competences. The aim of this paper is to provide a better understanding of competences needed for healthcare quality management based on a preliminary literature review and a non-exhaustive scan of existing educational offerings. There are considerable differences in types of education programs available in different countries. The UK and United States of America recognize healthcare quality management as a special occupation requiring formal university graduate level education. In the United States of America, there is a special accreditation system for such programs requiring coverage of 13 competence domains. Four of these domains are considered foundational: safety and error science, improvement science and quality principles, evidence-based practice, and measurement and process improvement. The UK National Occupation Standards also recognize a specific occupational role of quality assurance manager requiring 15 core competences. In EU member states accreditation of tertiary study programs is carried out in accordance with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). There are no specific requirements for contents relevant for healthcare quality management. Thus, there are differences in competences provided by different study programs. In addition to formal graduate level programs, it is also possible to enroll in short professional trainings, and short formal study programs at graduate and postgraduate level. One of the more recent approaches to lifelong learning in EU is through micro-credentials, which certify the learning outcomes of short courses or trainings, offering a flexible, targeted way of obtaining competences for professional development. A brief overview of different types of educational programs and competences they provide is given, including the only such program accredited in Croatia. Drawing on the Croatian postgraduate experience, we describe how structured curricula, workplace-based projects and mentorship can bridge classroom learning with on-site improvements in healthcare organizations. We propose practical steps for universities to strengthen management of quality of care and patient safety (MQoC&PS) education: embed core domains across pre-service curricula; scale flexible, work-integrated postgraduate pathways; and support faculty development to teach improvement and safety.

Keywords: Health Care Quality Assurance; Leadership; Patient Safety; Professional Education; Quality Improvement

Session C25. BURN-OUT SYNDROME AND THE IMPORTANCE OF MENTAL HEALTH OF STUDENTS AND TEACHERS

RUNNING ON EMPTY: WHY MEDICAL EDUCATION CANNOT AFFORD TO IGNORE BURN-OUT

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Burnout among physicians, residents, and medical students has become a public health crisis with profound consequences for individual well-being, patient safety, and the sustainability of the healthcare workforce. The aim of this presentation is to explore the multifaceted nature of burnout within medical education and to highlight evidence-based strategies for recognizing, preventing, and managing it at both the personal and institutional levels. The lecture will highlight current trends and data illustrating how chronic stress, long work hours, and performance pressures contribute to emotional exhaustion, depersonalization, and loss of fulfillment. It will also address how institutional culture and the hidden curriculum can reinforce unhealthy norms that perpetuate burnout. Finally, attendees will learn key strategies to promote resilience and wellness, including self-awareness, peer support, and organizational change. The ultimate goal of this session is to empower educators and trainees to recognize burnout not as a personal failure, but as a systemic signal demanding collective responsibility and reform.

Keywords: Medical Education; Medical Students; Physicians; Professional Burnout; Psychological Stress; Residency

STUDENTS' MENTAL HEALTH IN THE DIGITAL AGE: BURNOUT AS THE NEW REALITY

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Digital exposure represents a significant challenge to students' mental health. Digital media and social networks have become an integral part of everyday life, offering numerous advantages but also posing substantial risks. Digital stimulation through interactive media, notifications, and screens has emerged as a major disruptor of healthy sleep patterns, which are essential for emotional and mental health, particularly in adolescents and young adults. Long-term effects of excessive digital media use are chronic sympathetic and limbic system activation, reduced prefrontal cortex activity, and altered dopaminergic reward circuits, contributing to stress, anxiety, and weakened self-regulation. Psychological consequences of digital stimulation at bedtime are increased alertness and cognitive arousal, delaying sleep onset. Exposure to blue light emitted by screens suppresses melatonin secretion, delays sleep onset, and disrupts circadian rhythms, reducing deep and REM sleep. Epidemiological studies on medical students show that severe social media users have worse sleep quality, prolonged sleep latency, and delayed sleep than moderate users. In addition, >3 hours of daily social media use correlates with increased symptoms of burnout, including emotional exhaustion, depersonalization, and reduced sense of personal accomplishment. Although burnout has traditionally been linked to professional environments, it is increasingly recognized in student populations. Risk factors include information overload, constant availability, social comparison, and lack of offline time, driven by digital stimulation. Consequences range from poor academic achievement to cognitive impairment, emotional instability, mental health disorders, and sleep disturbances, perpetuating a vicious cycle. In conclusion, while digital technology shapes students' daily lives, it also requires targeted strategies to preserve mental health. Recommended measures include practicing digital hygiene (limiting screen time, especially before bedtime), raising awareness about the risks of overuse, promoting a balanced lifestyle with physical activity, and strengthening institutional support for the early recognition and prevention of burnout.

Keywords: Burnout; Circadian Rhythm; Mental Health; Sleep; Social Media; Students

BURNOUT, BANDWIDTH AND BEDSIDE MANNER

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The lecture examines how the pressures in digital age reshape the way a clinician provides patient care in acute and chronic psychiatric settings. Emerging digital infrastructures and continuous connectivity do not always ease the administrative burden, instead, they can increase the digital stress and the mental load for health personnel, reducing their cognitive bandwidth, degrading their communication and the treatment of the patients, and increasing the risk of emotional exhaustion and clinical disengagement. Drawing on observations from acute and chronic psychiatric practice and current evidence for the causal links between digital stress, workload and compassion fatigue, this lecture examines mechanisms by which electronic administration and alert overload amplify the stress and the effects on clinical decision making. Improved bedside approaches can preserve therapeutic alliance amid emerging pressures. Practical interventions are presented through strategies aimed at improving the attention and the emotional presence of the clinician during patient care, and strategies aimed at improving the team workflow and integrity to reduce unnecessary friction. Several clinical examples highlight the satisfaction and improvement of both the clinican and the patient when bandwidth is intact and cascading treatment failures when it is not. The bedside manner is a skill that can be trained, cultivated and protected, and should not be passively assumed.

Keywords: Burnout; Communication; Digital stress; Health Personnel; Psychiatry; Workload

BURNOUT IN DENTAL EDUCATION: ARE WE ADDRESSING THE MENTAL HEALTH OF STUDENTS AND TEACHERS ADEQUATELY?

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The dental profession is widely recognized as one of the most stressful healthcare fields. The stress associated with the dental profession often begins to emerge during dental studies. From early in their education, students are exposed to the pressures of precision-based tasks, clinical responsibilities, and the expectation to perform flawlessly in patient care scenarios. On the other hand, teachers in dental schools must balance clinical duties, academic responsibilities, and mentorship roles. As a result, both dental students and teachers may experience emotional exhaustion and anxiety. Burnout has become a major concern in dental education. The aim of this presentation is to examine whether the mental health needs of dental students and teachers are being adequately addressed in the context of burnout prevention and management. Existing institutional responses often rely on isolated wellness programs, which may not tackle deeper systemic issues such as curriculum design, assessment practices, or organizational culture. More sustainable approaches include accessible psychological support, peer mentoring, and faculty development initiatives aimed at resilience. Institutes should design and implement targeted interventions on energy management to strengthen students and teachers' well-being. By reviewing available evidence and highlighting best practices, this presentation emphasizes the need for a systemic, proactive approach to supporting mental health in dental education, ensuring a healthier and more sustainable future for the profession.

Keywords: Dental Education; Dental Faculty; Dental Students; Mental Health; Professional Burnout

ANALYSIS OF PSYCHOSOCIAL STRESORS AMONG DENTAL STUDENTS IN SARAJEVO AND ZAGREB

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Aim: To compare the level of stress caused by non-academic stressors among undergraduate dental students at the School of Dental Medicine, University of Zagreb, and the Dental School, University of Sarajevo.

Materials and Methods: This cross-sectional study was conducted among undergraduate dental students in Sarajevo (n = 324) during 2023–2024 and in Zagreb (n = 355) during 2022–2023, using a self-administered questionnaire constructed for the purpose of the study. Stress levels were measured on a Likert scale ranging from 1 (not stressful) to 5 (extremely stressful). The following stressors were included: career concerns, concern for future quality of life, parental expectations, family problems (loss of connection, illness, etc.), conflict between personal and student life, lack of free time, relationships with the opposite sex, loneliness, difficulty socializing with colleagues, competition among colleagues, thoughts about leaving studies, and decision to leave the profession after graduation. Statistical analyses were conducted in JASP, with a significance level set at $p < 0.05$.

Results: The highest median (Mdn) values in Sarajevo and Zagreb were observed for career concerns (4.00 vs. 3.00), concern for future quality of life (4.00 vs. 3.00), lack of free time (3.00 vs. 3.00), and commuting time (2.00 vs. 3.00). The average stress levels for these stressors were significantly higher among Sarajevo dental students compared to their colleagues in Zagreb. Dental students considered relationships with the opposite sex, loneliness, thoughts about leaving studies, and the decision to leave the profession after graduation as not stressful at all.

Conclusions: Dental students in Sarajevo and Zagreb showed a similar pattern of stress caused by psychosocial stressors. Further research is needed to provide more detailed insights into the complex associations between various stressors among students.

Keywords: Bosnia And Herzegovina; Croatia; Dental Students; Psychosocial Stressors

Workshop

WE TREAT EVERYONE BUT OURSELVES: MENTAL HEALTH OF MEDICAL STUDENTS

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Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn and work well, and contribute to their community. It has intrinsic and instrumental value and is a basic human right. Mental health exists on a complex continuum, which is experienced differently from one person to another. At any one time, a diverse set of individual, family, community and structural factors may combine to protect or undermine mental health. Although most people are resilient, people who are exposed to adverse circumstances are at higher risk of developing a mental health condition. The mental health of medical students is a growing concern worldwide, with studies indicating high levels of stress, anxiety, and depression among this population. Studies estimated presence of burnout to be between 33.4% and 55% among medical students. Burnout is described in terms of three main components: emotional exhaustion, depersonalization or cynicism, and decreased sense of personal accomplishment. In this workshop we will talk about mental health issues, about burn out and we will provide some suggestions on how to improve mental health in academic setting.

Keywords: Burnout; Mental Health; Students

Workshop

BRIDGING (DIGITAL) BURNOUT: MENTAL HEALTH AND RELATING IN EDUCATION

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In the digital era we live in, with stimuli overwhelming us on a daily basis, burnout and mental health have become common topics. In this workshop, we will explore our understanding of mental health as well as ways of dealing with burnout in the context of workplace and education. We will also look into which role relating to others and ourselves has in this process. The aim of the workshop is to broaden our understanding and active approach to mental health.

Keywords: Active; Principle Burnout; Education; Mental Health; Relating

THE ROLE OF THE CROATIAN DIASPORA IN ADVANCING MEDICAL EDUCATION

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The definition and role of diaspora in advancing education and economic development in countries of origin have evolved significantly in the modern era. Diaspora refers to individuals residing outside their country of origin or those who maintain meaningful ties with their homeland. Croatia has one of the largest diasporas globally, representing a substantial and underutilized asset for national prosperity and economic growth. The medical sector accounts for nearly 20% of the U.S. economy and leads the world in medical innovation. Members of the highly educated Croatian American diaspora, along with graduates of Croatian medical schools, have made disproportionately large contributions to advancements in medicine and biomedical science. Croatia's longstanding tradition in medical education and public health presents a strategic opportunity for regional and EU-wide partnerships and leadership. The Association of Croatian American Professionals (ACAP), a U.S.-based nonprofit founded in 2014 with over 3,000 members, exemplifies the emerging role of national diasporas. Moving beyond traditional models of philanthropy and remittances, ACAP facilitates the transfer of technology, knowledge, and innovation. It provides critical infrastructure to sustain momentum in these areas. ACAP initiatives include annual lifestyle medicine symposia, fellowships and clinical exchanges, career development webinars, cancer control research, and wellness promotion. These programs incorporate rigorous metrics for delivery and academic productivity. Notably, nearly all Croatian medical and biomedical postgraduates who engage with ACAP programs have returned to Croatia or expressed a desire to continue their work there. Key factors contributing to ACAP's success include a clear mission and vision, high standards, professionalism, altruism, volunteerism, transparency, diversity across professions, generations, and geography, as well as an apolitical and non-religious stance. ACAP's ability to bridge cultural gaps, manage expectations, foster community engagement, and collaborate with Croatian governmental agencies is supported by a strong organizational and governance structure.

Keywords: Associations; Diaspora; Economic Development; Innovation; Medical Education

TRANSFORMING EDUCATIONAL LITERATURE: TRENDS IN DIGITAL PUBLISHING

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This panel discussion convenes professionals from diverse domains who are engaged in the development, implementation, dissemination, and evaluation of contemporary digital learning resources. The session includes the presentation of two digital university editions: five textbooks in the methodology of medical education for medical teachers (*Modern and Practical Medical Education*), and two handbooks for performing basic clinical skills for medical students (*INTERMed project: Virtual Standardisation of Teaching and Learning Clinical Skills in Internal Medicine and Clinical Propedeutics*). In addition, through a series of thematically structured questions, panellists will critically examine all processes underlying the creation of digital educational editions. The discussion will address key stages of their development, including conceptualisation, technological design, video production, and platform selection, while also considering the pedagogical and organisational implications of integrating digital materials into higher education. Panellists will further reflect on student and teacher reception and perception, variations in expectations across user groups, and the institutional conditions that enable or constrain sustained innovation. The session will further highlight the critical importance of open scholarly books and freely accessible educational editions for equitable and sustainable academic practice. By juxtaposing experiences from voluntary, institutional, and commercially oriented production models, the session aims to illustrate the evolving landscape of academic publishing. Several overarching conclusions frame the dialogue. First, effective digital transformation of educational literature in higher education requires robust and coordinated institutional support, including centres for teacher education, university libraries with electronic-publishing units, and specialised IT support services. Second, the expansion of open digital educational editions represents an essential component of equitable and sustainable academic practice, enhancing accessibility and reducing financial barriers for learners. Third, rigorous verification and quality-assurance mechanisms are indispensable for maintaining the academic integrity and credibility of open materials. Finally, the panel underscores the need to establish an optimal balance between digital and printed editions, recognising that each format engages learners differently and supports distinct cognitive and pedagogical processes. Collectively, these insights contribute to a deeper understanding of current trends, challenges, and potential solutions, as well as help shape the future directions for digital scholarly publishing.

Keywords: Digital Publishing; Digital Transformation; Higher Education; Medical Education; Open Educational Resources; Scholarly Editions

TEACHERS OR TECH EXPERTS? IS MEANINGFUL DIGITAL TRANSFORMATION IN HIGHER EDUCATION POSSIBLE WITHOUT INSTITUTIONAL SUPPORT?

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As universities strive to modernise teaching and learning, the question remains whether meaningful digital transformation can occur without robust institutional support. This panel explores the widening gap between expectations placed on educators and the practical realities of implementing digital tools in higher education. Beginning with the issue of digital literacy, the discussion examines the mismatch between Generation Z learners and the pedagogical approaches of their teachers, emphasising the need for continuous professional development and a realistic understanding of what digital technologies can, and cannot achieve. The panel clarifies what “digital transformation” truly means, moving beyond basic LMS usage toward the creation and curation of high-quality digital content, the integration of AI into teaching, and the adoption of adaptive learning platforms. Through concrete examples from clinical education, large-scale educational projects, and national initiatives, speakers will illustrate the time, expertise, and organisational infrastructure required to sustain innovation. Attention will also be given to the gap between available institutional and national support systems and their actual uptake among teachers, raising questions about accessibility, training, and motivation. Ethical considerations in AI development, data privacy, responsible data sharing, and the challenge of navigating an oversaturated landscape of unverified digital content will also be addressed. A central theme of the panel is the human dimension of teaching: can all aspects of education truly be digitised, or do higher-order skills, professional identity formation, and the cultivation of values require fundamentally human interactions? The session concludes by emphasising the essential role of centralised and coordinated institutional support in driving meaningful digital transformation of higher education. This includes strengthening educators’ digital literacy, providing methodological and didactic guidance, ensuring strong administrative and IT support, assisting in the development and maintenance of digital educational materials, selecting platforms with verified content, and establishing clear institutional and national guidelines for the adoption of emerging technologies, while recognising that not everything is digitally transformable.

Keywords: Digital Literacy; Digital Transformation; Faculty Development; Higher Education; Medical Education; Soft Skills

EXPLORING THE ROLE OF SIMULATION LABS IN THE FUTURE OF MEDICAL EDUCATION

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Simulation has become a cornerstone of contemporary medical education, serving as a structured interface between theoretical knowledge and its safe application in clinical practice. Yet, simulation should primarily be regarded as a pedagogical tool whose effectiveness depends on the quality of its design and contextual relevance. To maximize its educational potential, as with any learning method, every component of simulation-based education must be carefully designed, aligned, and standardized: clearly defined learning outcomes must correspond to appropriate teaching methodologies, assessment strategies must be developed to measure their attainment, and educators (teachers, asistents, demonstrators, mentors, tutors) must be fully aware of their teaching responsibilities and expected outcomes. This process also requires adequate recognition of educator workload, since designing, delivering, and evaluating simulation sessions are resource-intensive tasks that demand both time and institutional support. Within this framework, the acquisition of core clinical and procedural skills forms the foundation upon which students from all healthcare professions gradually progress toward complex, scenario-based training that integrates cognitive, psychomotor, and communication competencies. Emerging technologies such as virtual and augmented reality further expand this continuum, bridging the current limitations of high-fidelity mannequins—particularly their inability to reproduce nuanced clinical signs such as changes in skin colour, emotional expression, or subtle behavioural cues. Moreover, the use of an AI-enhanced feedback system in simulations poses a significant additional challenge. When conceptualized and implemented through the principles of constructive alignment, simulation evolves from a standalone teaching activity into a coherent educational strategy that ensures vertical integration across learning, teaching, and assessment processes. This approach strengthens student competence and confidence, fosters patient safety, and promotes a culture of reflective, evidence-informed teaching practice. The panel will critically examine these aspects, addressing design principles, workload and faculty preparation, and the integration of novel technologies to redefine the role of simulation in the future of medical education.

Keywords: Clinical Competence; Medical Education; Patient Safety; Simulation Training

FLIPPED LEARNING UNPACKED: CHALLENGES AND SOLUTIONS

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As higher education continues to evolve toward learner-centered teaching, flipped learning has become one of the most recognizable and widely discussed innovations in medical education methodology. By shifting the acquisition of theoretical knowledge outside the classroom and dedicating in-person time to interactive and problem-oriented learning activities, an appropriately structured flipped classroom model aligned with assessment strategies should lead to a deeper engagement with subject matter, a stronger integration of knowledge and enhanced critical thinking in students. However, its practical implementation within complex medical curricula has revealed numerous challenges, including those related to sustainability, educator workload, student motivation, effective alignment between teaching/learning activities and assessment methods, as well as the need for infrastructural and institutional support. The successful application of the flipped classroom model relies on careful instructional design, clearly defined learning outcomes, alignment between pre-class and in-class activities, and assessment. When complemented by digital learning tools such as interactive presentations and formative quizzes, this approach can help ensure that students actively engage with materials before class sessions. At the same time, a thoughtfully planned face-to-face instruction remains essential for developing higher-order cognitive skills, clinical reasoning, and teamwork. In medical education, the sustainability of flipped learning depends on maintaining quality and coherence across courses, providing sufficient time and support for educators to develop digital and interactive resources, and fostering a shared pedagogical framework across teaching staff. Continuous evaluation, feedback loops, and alignment of assessments with intended learning outcomes are critical to achieving measurable educational benefits. The panel will explore key aspects of flipped learning in medical education, including curriculum integration, balance between online and onsite learning, coordination and faculty support, as well as examples of assessment alignment. By discussing current practices and emerging evidence, it will aim to provide an overview of major considerations for institutions seeking to enhance teaching effectiveness and student engagement through the flipped classroom model.

Keywords: Active Learning; Educational Innovation; Flipped Classroom; Medical Education; Teaching Strategies

BETWEEN IDEALS AND REALITY: FACULTY DEVELOPMENT UNFILTERED

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Faculty development (FD) is often discussed in aspirational terms—innovation, lifelong learning, and continuous improvement—but its practical implementation varies widely across institutions and national contexts. This panel brings together educators from Croatia, Australia, and the United States to explore what happens when FD ideals confront real-world constraints, and how institutions can build meaningful, sustainable development cultures. Grounded in the Croatian experience—where "faculty development" is still emerging beyond its traditional framing as simple teacher training—the discussion opens with personal narratives of how each panellist first encountered the concept of FD and how it is understood within their institutional cultures. By contrasting these experiences with established models in Australia and the USA, the panel highlights the diversity of assumptions and expectations that shape FD practices. The conversation then moves into the friction between ideals and reality. Panellists unpack their experiences modernising teaching, navigating institutional culture, securing administrative support, and managing faculty workload and motivation. A spotlight is placed on the Centre for Medical Education at the Faculty of Medicine in Rijeka as an illustrative case of building FD capacity within a transitioning system—revealing both successes and "behind-the-scenes" challenges. Through comparative perspectives, the panel examines what "ideal" FD might look like and asks whether effective models should be imported, adapted, or designed locally from the ground up. Barriers at national, institutional, and individual levels are discussed candidly, emphasising the critical role of administration, leadership, and systemic support structures. The session concludes with action-oriented insights. Each panellist offers an "unfiltered truth"—a key lesson learned in their FD journey—followed by a synthesis that underscores that there is no one-size-fits-all model. Effective FD depends on context-sensitive strategies, empowered institutional structures, administrative commitment, and a shift from isolated training events toward cultural transformation. This panel invites participants to reflect on their own FD ecosystems, consider adaptable strategies, and engage in honest conversations about what it truly takes to translate educational ideals into institutional reality.

Keywords: Academic Leadership; Educational Innovation; Faculty Development; Institutional Culture; Medical Education; Teacher Education

CROATIAN PATHWAY TOWARDS WFME ACCREDITATION

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Croatia's Agency for Science and Higher Education (ASHE) is working towards WFME Recognition to bring its national medical education accreditation in line with international standards. The WFME process—focused on self-evaluation, peer review, and observation of accreditation activities—acts as a developmental tool to enhance the quality, accountability, and global standing of medical programs. Achieving this recognition fosters ongoing improvements and is supported by evidence linking robust educational and assessment practices to better patient outcomes. For all Croatian medical schools, acquiring WFME recognition would enhance internationalisation efforts, boost global visibility, and facilitate student and graduate mobility, including access to jobs worldwide for international students. Overall, obtaining WFME accreditation would promote international collaboration, attract more foreign students, and showcase the high standards of Croatian medical education.

Keywords: WFME; Accreditation; Medical Education; Internationalisation; International Students