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United Arab Emirates University

COMPETENCIES

FOR MEDICINE AND **BEYOND**

SYMPOSIUM 2024

ABSTRACT BOOK

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United Arab Emirates University

CMB

COMPETENCIES

FOR MEDICINE AND **BEYOND**

SYMPOSIUM 2024

Join us for the Competencies for Medicine and Beyond Symposium 2024, an essential event for medical educators, healthcare professionals, researchers, and curriculum designers who are shaping the future of medical education. This symposium is dedicated to exploring the principles, implementation strategies, and outcomes of competency-based medical education (CBME), an educational approach that emphasizes the development of core competencies required for clinical practice emphasizing the newly developed EmiratesMEDS.

REGISTRATION

14 DECEMBER 2024

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AUDITORIUM D1-B2001

ABOUT THE SYMPOSIUM

CMB 2024 brings together thought leaders and practitioners to share best practices, innovations, and strategies for implementing CBME in medical schools and healthcare institutions. The symposium will address the critical components of CBME, including curriculum design, assessment strategies, and faculty development, as well as the challenges and opportunities associated with competency-based approaches.

Whether you are just beginning to explore CBME or are already involved in its implementation, this event will provide valuable knowledge and actionable insights to enhance your institution's medical education programs.

The purpose of this one-day symposium is to explore the critical aspects of Competency-Based Medical Education (CBME) and its evolving applications beyond traditional medical education models. The symposium aims to provide participants with:

- Endorsement of Implementation documents of EmiratesMEDs by CAA and Dean"s
- A deep understanding of CBME principles and frameworks emphasizing EmiratesMEDs.
- Practical approaches for integrating CBME into medical curricula.
- Exploration of innovative strategies and global trends that extend beyond standard CBME.

SYMPOSIUM CHAIR

PROF. FATMA AL JASMI

ACTING DEAN OF COLLEGE OF MEDICINE AND HEALTH SCIENCES
UNITED ARAB EMIRATES UNIVERSITY

Dr. Fatma Al Jasmi is a Professor of Pediatrics and Acting Dean of College of Medicine and Health Sciences, UAE University, Al Ain, and a Metabolic consultant at Tawam Hospital. She did her undergraduate studies at UAE University, UAE, and graduated in 2000 with a bachelor's in Medicine and health science. She pursued her postgraduate studies at the University of Toronto, and the Hospital for Sick Children, Canada. In 2006, Dr. Al Jasmi received the Canadian Board of Pediatrics after completing the Pediatric residency program. Subsequently, she did her fellowship in biochemical genetics, and in 2008 she was certified by the Canadian College of Medical Genetics Board (Biochemical Genetics).

Competencies for Medicine and Beyond Symposium 2024, UAEU, Al Ain

TIME	DESCRIPTION	PRESENTER
08:00 - 08:30	Registration and Welcome Coffee	
Opening Session Chair: Prof. Juma Al Kaabi		
08:30 - 08:45	Welcome Speech and Opening Remarks on CMHS, UAEU and Health System Partnership	Prof. Ahmed Al Raeesi Acting Vice Chancellor, UAEU
08:45 - 09:00	Opening Remarks on CMHS, UAEU and Health System Partnership	Prof. Juma Al Kaabi Vice Dean CMHS, UAEU
09:00 - 09:15	Symposium Objectives	Prof. Mohi Eldin Magzoub Chair Dept. of Medical Education, CMHS, UAEU
09:15 - 10:00	Signing EmiratesMEDs Framework Phase 2: **Implementation guidelines**	EmiratesMEDs collaborators: UAE medical Schools Deans, NIHS
Session 1: Emirates MED in action Chair: Prof. Juma Al Kaabi		
10:00 - 10:20	Competency-Based Health Professions Education (A Wicked Problem): Seeing it Through the Lens of Systems Thinking	Prof. Hossam Hamdy Chancellor, Gulf Medical University, Ajman
10:20 - 10:40	Strategies for enhancing medical research production: Sharjah Experience	Prof. Eman Abu-Gharbieh Vice Dean, College of Medicine, University of Sharjah
10:40 - 11:00	**Break**	
11:00 - 11:20	Challenges with competencies application	Prof. Ismail Matalqa President, RAK Medical & Health Sciences University
11:20 - 11:40	Health system role in applying competency-based education	Dr. Hatem Al Ameri Director Division of Healthcare Workforce Monitoring, Department of Health Abu Dhabi, UAE
11:40 - 13:00	**Lunch & Prayers Break**	
Session 2: Teaching Competencies Chair: Dr. Rami Beiram		
13:00 - 13:15	Transforming Medical Education: Integrating Health System Science for Future-Ready Healthcare Professionals	Dr. Mohamed Hasan Taha Director of the Medical Education Center, University of Sharjah
13:15 - 13:30	Professionalism teaching and assessment	Dr. Sawsan Abdelrazig Chief Academic Officer, Primary Care Medicine, Medical Subspecialties Institute
13:30 - 14:00	AI in medical education	Prof. Nabil Zary Senior Director - Institute for Excellence in Health Professions Education
14:00 - 14:15	Use Cases of AI in Assessment and Remediation in Medical and Health Professions Schools	Prof. Senthil Kumar Rajasekaran Vice Dean of College of Medicine and Health Science, Khalifa University
14:15 - 14:30	**Refreshment**	
14:30 - 15:00	Panel Discussion : What is the future of the medical school? **Chair: Dr. Susan Waller** Prof. Mohi Eldin Magzoub, Prof. Hossam Hamdy, Prof. Mohamed Eliraki, Dr. Hatem Al Ameri, Prof. Solomon Senok	
15:00 - 17:00	Parallel Thematic Poster Sessions	* *Please refer to next page for details* ➤

Competencies for Medicine and Beyond Symposium 2024, UAEU, Al Ain

TIME	DESCRIPTION	PRESENTER
Parallel Thematic Poster Session -1- Chair: Dr. Susan Waller		
15:00 - 15:15	Implementation of EmiratesMEDs	Dr. Susan Waller
15:15 - 15:30	Exploring the structure of resilience in preclinical medical students in the UAE: Insights for CBME	Dr. Mariam Shadan
15:30 - 15:45	Integrating 21st-Century Skills into DMCG's Curriculum	Dr. Abdelmoniem Sahal Elmardi
15:45 - 16:00	Empowering Educators for Excellence: Faculty Development in Competency-Based Medical Education	Dr. Dina Mohamed Salaheldin Mohamed Nasr
16:00 - 16:15	The Role of Feedback in Competency-Based Medical Education (CBME)	Dr. Awad Mansour Awad Al-Essa
16:15 - 16:30	Implementation of Student-led Professionalism Training and Assessment in Emergency Medicine Clerkship	Dr. Munawar Farooq
16:30 - 16:45	Impact of assigning teaching roles to students in basic surgical skills on their peer's performance	Dr. Amer Hashim Hassan Al Ani
16:45 - 17:00		
Parallel Thematic Poster Session -2- Chair: Prof. Milos Ljubisavljevic		
15:00 - 15:15	Regulating Competency-Based Learning through Workplace-Based Assessment: DMCG's Journey	Dr. Heba Ismail Abdelreheem Abdelaziz
15:15 - 15:30	TACTIC (Team-Based Analysis for Critical Thinking in Clinical Cases Discussion)	Dr. Moamar Al-Jefout
15:30 - 15:45	AI Meets Medical Education: Revolutionizing Entrustable Professional Activities	Dr. Rasha Eldeeb
15:45 - 16:00	Exploring Automated Scoring of Key Feature Problems Using Large Language Models in Medical Education: A Pilot Study	Dr. S. Ayhan Çalışkan
16:00 - 16:15	The Role of Artificial Intelligence in Predictive Medicine: Review	Dr. Samah Badr Hamad Elkhidir
16:15 - 16:30	Trainees' Perspectives on the Educational Environment	Dr. Tahra AlMahmoud
16:30 - 16:45	Diabe-Teach: A RCT of a gamified learning model for enhancing competencies across medical discipline	Dr. Mariam Shadan
16:45 - 17:00		

Implementation of EmiratesMEDs in the Existing Curriculum

Susan Waller[1]

[1]Department of Medical Education, United Arab Emirates University, Al Ain, UAE

Introduction:

The Deans of UAE Medical Schools formed a task force to develop a national competency framework for the United Arab Emirates for undergraduate medical programs. The impetus was the need to ensure the level of competency on transition from the program to internship and early residency. Emirates Medical Education Directives (EmiratesMEDs) was born out of extensive research and consultation across all medical programs. The aim of this presentation is to demonstrate how aspects of EmiratesMEDs can be incorporated into the existing curriculum.

Methods:

Each domain was investigated for its presence in the current MD program at the College of Medicine and Health Sciences at UAE University. Entrustable Professional Activities (EPAs) as included in the framework were also partially introduced and assessed where possible.

Findings:

Each of the nine domains has been included in some way and to a varying extent in the three phases of the existing MD program. Strengthening the use of the student ePortfolio to illustrate personal and professional development has been accompanied by mentoring by faculty and senior students. Particularly in the PreClinical phase, more active and dynamic teaching methods have replaced traditional lectures. The integration of competencies, other than knowledge, into a crowded curriculum is challenging. As with many traditional 6-year curricula, the PreMedical phase is crowded with scientific content without integration or consideration of the end goal—transition to internship. Longitudinal teaching and learning will support a spiral curriculum to facilitate the development of competencies other than knowledge. Valid and reliable assessment of certain competencies is challenging, such as professionalism and other people skills. Some competencies are not well covered, such as EBM and scholarly competencies, but they have been introduced earlier in problem-based learning where students construct a clinical question collaboratively and complete a clinical reasoning assignment.

Discussion:

Challenges reflected in the literature on curriculum change were the need for faculty development and passive resistance to change. Assessment is based on course content rather than Course Learning Outcomes (CLOs) and PLOs, requiring redirection to be outcomes- and EPAs-focused. Early Clinical Exposure and assessment of EPA behaviors in the Longitudinal Clinical Skills course are supporting a greater focus on all competencies presently reflected in the six program learning outcomes. There is an imperative that the existing MD program must offer students the opportunity to develop collaborative competencies if they are to be ready for transition to internship. More clinical practice time and earlier interaction with patients and other healthcare professions and students will be aimed for in the existing program.

Conclusion:

Comprehensive implementation of the ePortfolio will capture all competencies longitudinally, complementing existing assessments in the preclinical and clinical phases. "Earlier, often, and together" is the catch cry of the efforts to strengthen the current MD program at UAEU. More integration and collaboration, as well as greater time spent in the community, will support the students to also fulfill the requirements of the EmiratesMEDs framework.

Exploring the structure of resilience in preclinical medical students in the UAE: Insights for Competency-Based Medical Education

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[2]Department of Geography, University of Southampton, Southampton, UK

Background: Resilience is a crucial competency for medical students, enabling them to navigate the challenges of rigorous academic and clinical training. Within the EmiratesMEDs framework, fostering resilience is essential for aligning with Competency-Based Medical Education (CBME). This study explores the structure of resilience in preclinical medical students in the UAE, aiming to identify factors that promote resilience and inform curriculum development.

Methods: A mixed-methods approach was employed, incorporating quantitative and qualitative analyses. Data were collected from preclinical medical students at UAE medical colleges using the Resilience Scale-14 (RS-14) and Academic Resilience Scale-30 (ARS-30). Statistical analyses evaluated the influence of demographic factors (gender, nationality, and year of study) on resilience, while an interpretivist approach was used to analyze students' subjective experiences of resilience in stressful educational contexts.

Results:
Quantitative findings revealed no statistically significant relationship between resilience and demographic variables. However, resilience showed a predictive relationship with academic resilience, indicating that students with higher resilience levels are better equipped to manage academic challenges. Qualitative analyses highlighted the interdependence of intrinsic factors (Self-belief, Reflection, Help-seeking) and extrinsic factors (Supportive relationships and Enabling environments). These findings emphasize the need for targeted interventions to build resilience as part of CBME.

Conclusions: This study underscores the importance of embedding resilience-building strategies into CBME curricula, with a focus on creating supportive learning environments and incorporating tools like the RS-14 for ongoing assessment. By addressing resilience as a competency, medical schools can better prepare students to thrive in demanding academic and professional environments.

Keywords: Resilience, Competency-Based Medical Education, EmiratesMEDs, Curriculum Design, Academic Resilience

Integrating 21st-Century Skills into DMCG's Curriculum

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The 21st century is characterized by rapid technological advancements, globalization, and complex societal challenges, necessitating a paradigm shift in higher education. The medical education landscape is shifting under several forces that are increasingly aligning the goals of business, government and education. This shift stimulated discussions around the globe about the role of higher education institutions in producing employable graduates to feed national prosperity in the emerging knowledge economy. As this evolution continues, medical educators needed to consider how they enhance generic graduate abilities as well as their disciplinary and professional expertise. Conscious decisions about our curriculum content and co-curricular activities, pedagogies and the nature and use of learning spaces, need to be made. Traditional curricula focused solely on disciplinary knowledge are insufficient for preparing graduates for the dynamic demands of modern society and the workforce. Recent publications by economy & industry leaders as well as researchers and educators identified some critical 21st-century skills that need to be integrated into university curricula to shape university graduates' attributes effectively. While developing a new MD curriculum for DMCG, a discussion was initiated about the content and processes that need to be integrated into the curriculum to foster the acquisition and mastery of 21st-century skills by the graduates. We started by analyzing various educational frameworks, pedagogical strategies, and case studies relevant to the integration of 21st-century skills in the medical education curriculum. Based on this benchmarking and desktop analysis, a conceptual framework that identifies and defines these skills, underscores their importance, and explores methodologies for their incorporation. It was then decided that an introductory course should be designed that covers the 10 most widely agreed upon generic skills, namely, Critical Thinking and Problem-Solving, Creativity and Innovation, Communication, Collaboration, Digital Literacy, Global and Cultural Awareness, Leadership and Responsibility, Adaptability and Resilience, Ethical Reasoning. It was also decided that the course should use innovative pedagogical practices namely active learning strategies, collaborative learning techniques, technology-enhanced learning, and experiential and service learning, to enable students to acquire and master these skills. The second delivery of the course has just ended, and surveys and investigations are planned to explore its effectiveness in integrating the concept, the level of satisfaction of learners and educators, and to identify areas for improvement.

Empowering Educators for Excellence: Faculty Development in Competency-Based Medical Education and EmiratesMEDs Integration at Dubai Medical College for Girls

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[1]Dubai Medical College for Girls, Dubai, UAE

The transition to Competency-Based Medical Education (CBME) and the integration of the Emirates Medical Education Directives (EmiratesMEDs) framework represent a pivotal step in advancing medical education at Dubai Medical College for Girls (DMCG). To support this transformation, DMCG implemented a comprehensive faculty development program aiming at equipping educators with the skills and knowledge necessary to align with national and international standards.

The program focused on key areas including competency-based curriculum design, mapping course content to the EmiratesMEDs competencies, and developing robust assessment methodologies such as Entrustable Professional Activities (EPAs) and programmatic assessments. Through training sessions and collaborative curriculum mapping workshops, faculty were empowered to foster an outcome-driven learning environment despite that most of the faculty members were resistant to accept the transformative changes in addition to the non- compliance of the adjunct faculty to attend the training session offered by the faculty development unit at DMCG.

Active participation in the development and implementation of the EmiratesMEDs framework by DMCG faculty highlighted the institution's leadership in shaping medical education in the UAE.

This initiative not only strengthened the teaching capabilities of faculty but also ensured the alignment of DMCG's curriculum with UAE healthcare priorities, ultimately enhancing the quality of graduates prepared to meet the evolving demands of the healthcare sector. The program demonstrates the vital role of continuous faculty development in advancing competency-based education and setting benchmarks for excellence in medical training.

The Role of Feedback in Competency-Based MedicalEducation (CBME)

Awad Mansour Awad Al-Essa[1]
[1]Department of MedicalEducation, United Arab Emirates University, Al Ain, UAE

Feedback is an integral component of Competency-Based Medical Education (CBME), serving as a criticaltool for guidinglearners toward achieving predefined competencies. In CBME, the emphasis shifts from time-based progression to individualized learning, making frequent, specific, and actionable feedbackessential for assessing and promoting learnerdevelopment.

This presentation explores the multifaceted role of feedbackin CBME, focusingon its function as a bridge between performance and competency attainment. We examine key feedback strategies, including formative and summative approaches, and how frameworks such as Entrustable Professional Activities (EPAs) and milestones rely on effective feedback for success. Challenges such as feedback delivery, learner engagement, and the impact of the learning environment are addressed.

Through case examples and evidence-based practices, attendees will gain insights into fostering a feedback-rich culture that supports continuous improvement and learner accountability. By prioritizing meaningful feedback, educatorscan enhance the alignment of learning outcomes with healthcare standards, ensuring that graduates are prepared for the complexities of medical practice.

Implementation of Student-led Professionalism Training and Assessment in Emergency Medicine Clerkship

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Introduction: Professionalism, a dynamic construct, is shaped by regional context, encompassing societal values and beliefs. Within the medical domain, professionalism significantly influences doctor-patient relationships, patient experiences, and clinical outcomes. Existing literature indicates that medical students' exposure to an informal, hidden curriculum during clinical years may contribute to a decline in professionalism. Nonetheless, there remains a gap in the literature regarding the effective implementation of professionalism learning within the constrained timeframes of various clerkships.

Aim: The study aimed to implement a structured, student-led learning of professionalism in Emergency Medicine Clerkship and to evaluate its impact through students' reflections.

Methods: During the 2023/24 academic year at CMHS, UAEU, an educational intervention study on professionalism was conducted within the Emergency Medicine Clerkship. Students were briefed on professionalism models in the initial session. Subsequently, they led discussions on professionalism aspects in clinical cases encountered on the clinical floor to uncover the hidden curriculum. Their comprehension was reinforced when they conducted anonymous self-assessments and peer assessments of professionalism traits.The impact of this learning approach was evaluated through thematic analysis of students' written reflections, utilizing an inductive approach with NVivo 12.

Results: Several key themes emergedacross the 26 reflective assessments, including effective communication, empathy, culturalcompetence, and mutual respect. Busy schedules, languagebarriers, and difficultpatients or colleagues were some of the barriersreported by students.Students concluded that continuous reflection and learning are essential for recognizing and addressing gaps in practice, fostering a culture of respect and accountability.
A paired-sample t-test was conducted to assess the impact of training on self-assessed knowledge and ability scores. There was a significant difference in knowledgescores before ($M = 22.08$, $SD = 5.06$) and after ($M = 25.42$, $SD = 4.67$) clerkship $t(52) = 5.225$ $p = <0.01$.
Similarly, abilityscores showed a significant difference before ($M = 11.09$, $SD = 2.37$)and after ($M = 12.75$, $SD = 2.41$) clerkship; $t(52) = 4.71$, $p < 0.01$.

Conclusion: Unpacking of hidden curriculum through regular case-based discussions and anonymous self- and peer-assessment are effective for fostering professionalism and understanding during clerkships. Students' written reflections highlight key themes such as effective communication, cultural competence, teamwork, ethical conduct, and continuous learning. Integrating these principles into medical education facilitates the development of healthcare professionals committed to delivering professional, patient-centered care.

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Figure

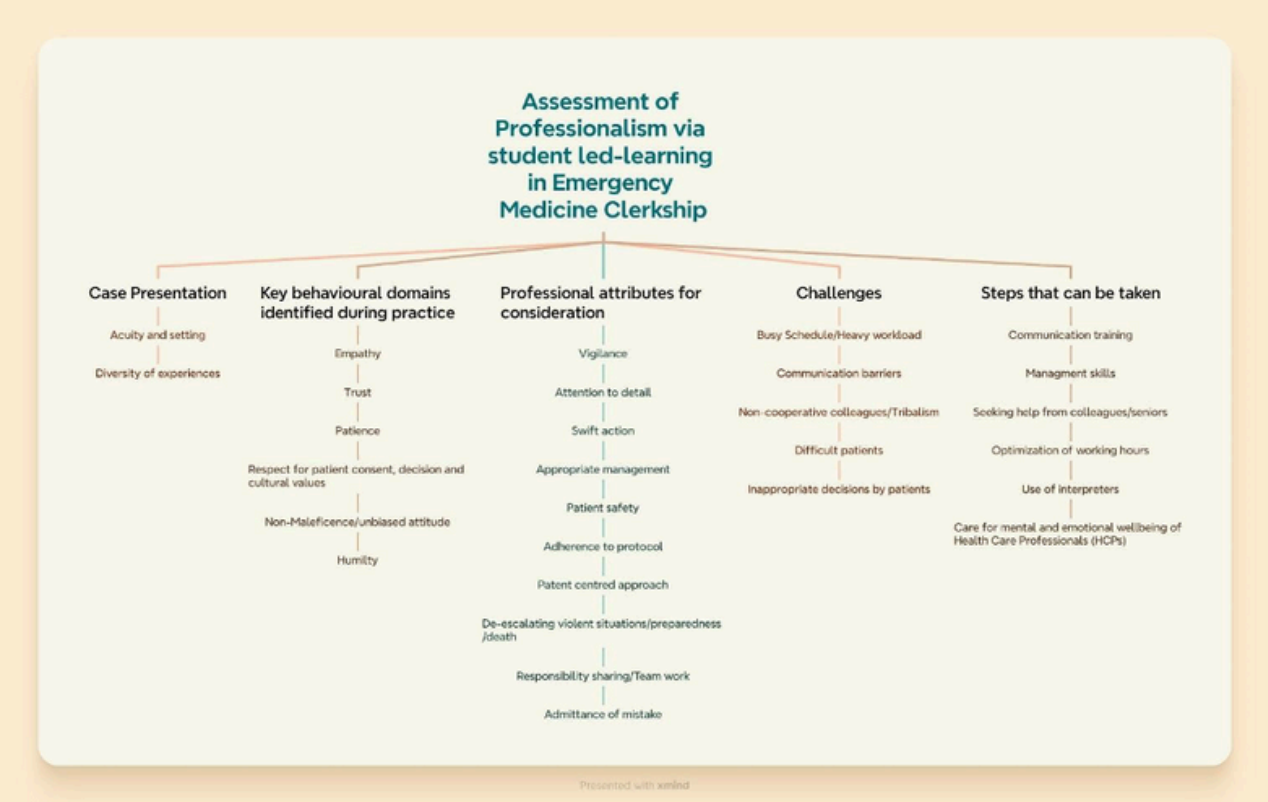

Figure: Themes and Subthemes from students' reflections on Professional Care.

Impact of assigning teaching roles to undergraduate medical students in basic surgical skills sessions on their peer's performance in these sessions

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Introduction: The development of medical students' teaching skills is an essential part of medical curriculum. Despite the awareness of its importance in teaching medical students, the number of studies addressing the attempts to improve this topic is limited. Medical students regularly participate in study groups during courses and prior to examinations, thus assuming informal teaching roles. They also teach in other settings, as they become sources of health information for family, friends, and, during their clerkship, for patients. Student's ability to acquire enough surgical skills to perform routine technical procedures at a level suitable to a fresh medical graduate is another important skill to acquire.

Methods: At Ajman University's College of Medicine, we conducted basic surgical skills sessions to assess the impact of peer tutoring versus instructor-led training. A total of 100 students participated, with 50 trained by certified instructors and 50 by peer tutors.

Results: Performance was evaluated across four tasks. For threading 10 loops, 2.9% of instructor-trained students succeeded vs. 7.1% of peer-taught students ($p = 0.649$). In stacking five cubes, success was 50% for instructors vs. 48.9% for peers ($p = 0.031$). Both groups excelled at picking 10 peas (97.2% vs. 97.6%, $p = 0.713$). For laparoscopic knots, success rates were 28.2% (peers) vs. 25% (instructors, $p = 0.181$). Cutting a circle of tissue showed 72.2% success for instructors vs. 24.4% for peers ($p = 0.002$).

Discussion: Results indicate varying effectiveness between peer tutoring and instructor-led training. While peer tutors can enhance learning, instructor-led sessions are crucial for mastering complex skills.

Conclusion: This study supports the value of both teaching methods in medical education, suggesting future research into hybrid models to optimize surgical training.

Regulating Competency-Based Learning through Workplace-Based Assessment: DMCG's Journey

Heba Ismail1, Rawda Mehanna1, Rawan Mehanna1, Umama Naeem1, Momna Basher1, Yassein Kamal1, Mariam Shadan1, Arina Ziganshina1, Yousif Eltayb1

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Background: As medical education transitions to competency-based learning, workplace-based assessment (WBA) has become vital for tracking students' progress in mastering clinical competencies during their undergraduate medical training and for providing real-time feedback in authentic settings. This case study examines the challenges and solutions in implementing a digital WBA system at Dubai Medical College for Girls.

Methods: WBA was conducted using Blue, a survey platform that was customized for clinical assessments. The WBA involved the assessment of Year 4 and 5 MBBCh undergraduate medical students using standardized checklists aligned with Entrustable Professional Activities (EPAs) and the Emirates MEDs Competency Framework during rotations in Pediatrics, Obstetrics & Gynecology, Internal Medicine, Surgery, and Primary Healthcare. Data from February to December 2024 were analyzed to evaluate engagement trends among students and preceptors and to track students' performance.

Results: Over two phases (February-June and August-December 2024), 4854 WBAs were collected from 118 students and 162 preceptors. Engagement metrics included student reflections (mean=43.06%), assessment initiation (mean=68.37%), and preceptor completion (mean=61.06%). While reflection rates significantly improved ($p<.05$), initiation and completion rates declined ($p<.05$). Declines in initiation and completion rates were notable during the surgical rotation in phase 2 ($p<.05$) and in completion rate during the Obstetrics & Gynecology rotation ($p<.05$).

Conclusion: This study demonstrates that Explorance Blue platform's user-friendly interface and detailed EPAs attainment reports enhanced stakeholder engagement. However, provision of more training of preceptors about giving quality feedback and reinforcing the importance of reflection among students to increase the engagement. Future efforts are directed towards faculty development, quality assurance and improvisation of the system by gathering student and preceptor feedback and integration of WBAs as low-stakes assessments in the MD curriculum.

Keywords: digital, competency-based medical education (CBME), workplace-based assessment (WBA).

TACTIC (Team-Based Analysis for Critical Thinking in Clinical Cases Discussion)

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3 Institute of Psychology, Erasmus University, Rotterdam, The Netherlands

Background: Medical education is rapidly evolving. Recently, there has been much effort within medical schools to depart from conventional lecture-based learning approaches to alternative teaching methods.

Aim: The development of a new approach to medical education that integrates the maximum number of education theories and enhances critical thinking in undergraduate clinical years.

Methodology: Conduct a pilot study to explore the effectiveness of TACTIC (Team-Based Analysis for Critical Thinking in Clinical Cases Discussion) vs traditional teaching using lecture-based Learning (LBL) in a group of fifth-year medical students.

Results: 18 of the 19 domains explored which included: gaining knowledge, the comfort of learning, history, and clinical examination skills, clinical management skills, patient counselling skills communication skills, teamwork skills, EBM skills, investigation skills, and presentation skills, were statistically significant (p-value <.001) for the exception of learning comfort (Mean- 7.53 and 7.94 P value 0.616). In addition, most of the comments from students were positive regarding the proposed method. The overall learning outcome score [Lecture] vs. overall learning outcome score [TACTIC] have statistically significant differences in favor of TACTIC (Mean Difference Std. Deviation, Std. Error Mean 95% Confidence Interval of the Difference, One-Sided p, and Two-Sided respectively (3.412, 1.622, 0.394,-4.246,-2.578, -8.670, t <.001 and df <.001). For the exception of Comfort of teaching [Lecture] vs the comfort of teaching (TACTIC) and Improving my medical management [Lecture], vs Improving my medical management [TACTIC] (Means- 6.71 and 9.18, P value 0.002 (trend). In addition, Wilcoxon Signed Ranks analysis confirmed the same results (Z-3.545, P value 0.000).

Conclusions: The proposed new method (TACTIC) has the potential to replace the old, traditional presentation done by a teacher (LBL), with new integrated methods which are student-centered on teamwork to enhance multiple learning skills with a focus on critical thinking.

Key words: Critical thinking; medical education; teamwork; learning outcomes

Artificial Intelligence (AI) Meets Medical Education: Revolutionizing Entrustable Professional Activities (EPAs)

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Background: Entrustable Professional Activities (EPAs) are a keystone of competency-based medical education (CBME), serving as valid and reliable measurable tasks that determine learner's readiness for independent unsupervised clinical practice. Concurrently, artificial intelligence (AI) uptrend integration in health profession education provided potential equipment for personalized learning, objective assessment, and adjustability. Appreciating the intersection of EPAs and AI would enhance medical education reform.

Objectives: This paper spotlights the role of AI in enhancing the implementation of EPAs with its application, challenges, and future directions.

Methods: A comprehensive literature review of the recent literature on EPAs and AI usage in medical education was conducted. Key themes included the role of AI in feedback, assessment, and scalability.

Results: AI shows promising potential in EPAs assessment, as AI-supported systems can provide:

- Objective assessment: AI can analyze the learner's performance based on multimodality data (e.g.video, voice, physiological matrices).
- Personalized feedback: Based on the learner's performance of the task, adaptive AI tools can identify areas of strength and areas for improvement.
- Predictive analysis: Based on the learner's performance pattern, AI models predict the individual readiness for unsupervised practice.

These AI abilities tackle the challenges in EPAs such as the limited faculty resources, the subjectivity, and the need to establish standardization across educational settings.

Conclusion: Integrating AI with the EPAs is a revolution in health profession Education as it enhances assessment, provides individual objective feedback, and ensures adjustable and scalable implementation. On the other hand, the challenges of algorithmic bias, data privacy and security, and the validation of various settings must be tackled. Further studies should be conducted on tailored AI tools for EPAs to ensure valid, reliable, equitable, and reasonable integration in Health Profession education.

Keywords: Artificial intelligence (AI), Assessment, Entrustable Professional Activities (EPAs), HealthProfession Education.

Exploring Automated Scoring of Key Feature Problems Using Large Language Models in Medical Education: A Pilot Study

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1Ege University, Faculty of Education
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Background: Key Feature Problems (KFPs) are one of the useful question types in medical education for assessing clinical decision-making. However, manual scoring is resource-intensive, time-consuming, and prone to inconsistencies among evaluators. Advances in artificial intelligence, particularly large language models (LLMs), offer a promising solution by enabling automated scoring (AS). This pilot study evaluates the performance of ChatGPT-4o for KFP AS compared to human raters.

Methods: A single KFP comprising six (one selected and five constructed response) questions was picked from the Obstetrics and Gynaecology Year 5 clerkship exam conducted in October 2024. The KFP exam was administered electronically using the BlackBoard Learning Management System. Student responses and faculty scores from the exam were anonymized and scored by a research team using ChatGPT-4o. Selected response question (Q5) was excluded. We utilized zero-shot with rubric approach using ChatGPT-4o to score responses. The level of agreement between ChatGPT-4o and human scores was analysed, with visual representation highlighting score differences, where zero indicated perfect agreement.

Results: ChatGPT-4o demonstrated excellent consistency with human scoring for Q3 and Q4, moderate agreement for Q1, and notable discrepancies for Q2 and Q6. Discrepancies were primarily attributed to ambiguities in the scoring rubric as partial credit assignment was not given in detail. Pilot trials incorporating updated rubrics has improved the agreement level.

Conclusions: ChatGPT-4o zero-shot with rubric approach shows high potential for KFP AS, particularly when guided by carefully prepared rubrics and hence prompts. Addressing ambiguities and incorporating partial credit criteria into prompt design can further enhance reliability. This study highlights the potential of integrating LLMs into medical education assessments to streamline scoring processes.

Keywords: Key Feature Problems, Large Language Models, Medical Education, Automated Scoring, ChatGPT-4o, zero-shot with rubric

Trainees' Perspectives on the Educational Environment

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Background: Ethics and professionalism are recognized as core competencies in medical practice worldwide. Several studies have investigated the teaching and learning methods for this subject. However, there are few reports on the students' views and experiences with professionalism in their working environment. The aim of this study was to assess the professional attitudes and behaviors that exist in the health care environment as perceived by clinical clerks.

Materials and Methods: An anonymous paper questionnaire was distributed to a total of 134 final year clinical clerks. Standard descriptive statistics, unpaired t-test to evaluate differences between male and female groups were used.

Results: 114 (86%) completed the survey. Students frequently identified health professionals whom that they consider role models (mean=6.68±2.126 on a scale of 0 to 9; and 6.62±2.17 respectively). They very frequently observed that health professionals place the needs of their patients ahead of their own self-interests 7.25±1.69 and 6.87±2.095 respectively. Students reported seldomly being urged by medical colleagues and allied healthcare workers to copy their history and physical exam rather than gathering their own information from the patient (mean 3.26±5.14 versus 2.83±3.19) or observing health professionals scheduling tests or performing procedures at times that are more convenient for themselves than for the patient (mean 3.37±-2.96 and 3.32±3.043 respectively). Male students more often observed unprofessional behaviors (P< 0.05) compared to female counterparts.

Conclusion: Students viewed physicians and allied healthcare workers positively, however, academic attention needs to be directed at ethical and professional dilemmas that are encountered during their training.

Diabe-Teach: A randomized controlled trial of a gamified learning model for enhancing competencies across medical disciplines

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Background: Competency-Based Medical Education (CBME) emphasizes the development of core competencies such as knowledge retention, critical thinking, communication, and reflective practice. Gamification offers a promising strategy to achieve these objectives. "Diabe-Teach," an educational board game, was designed to enhance medical students' understanding of diabetes mellitus and explore its potential as a scalable model for fostering competencies across various medical topics.

Methods: A randomized controlled trial was conducted with 56 preclinical medical students at Dubai Medical College. Participants were randomized into a gamified learning group or a control group. Both groups received identical instructional content on diabetes mellitus, with knowledge retention assessed using pre- and post-test scores. Student engagement, communication, and perceptions were evaluated through a structured feedback survey.

Results: The gamified learning group demonstrated significantly higher post-test scores ($p < .001$) compared to the control group. They also exhibited improved critical self assessment, as reflected in increased "I do not know" responses over incorrect guesses. Feedback from the gamified group highlighted enhanced communication skills through collaborative gameplay, greater reflection facilitated by feedback loops, and improved ability to correlate theoretical knowledge with clinical scenarios. The engaging design of "Diabe-Teach" fostered higher-order thinking by encouraging analysis, synthesis, and problem-solving in a dynamic learning environment.

Conclusions: "Diabe-Teach" proved to be an effective tool for enhancing medical expertise and fostering key competencies such as communication, reflection, and higher order thinking. The game's flexible and interactive framework supports its scalability to other medical topics and disciplines, making it a valuable addition to CBME curricula. Future adaptations, including digital formats, could further extend its reach and impact across diverse educational contexts.

Keywords: Competency-Based Medical Education, Gamification, Randomized Controlled Trial, Medical Expertise, Communication, Reflection, Higher-Order Thinking, Interdisciplinary Learning

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