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MEDICAL STUDENT RESEARCH ENGAGEMENT AND RESIDENCY MATCH IN THE UNITED STATES

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PURPOSE: Increasingly, research or scientific method knowledge and skills are relevant and essential requisites for physicians. However, while the inclusion of research related activities in the curriculum of U.S. medical schools is growing, the importance of research experience in obtaining medical residency positions is not fully examined.

METHODS: This study reviewed the importance of student involvement in research among other factors, from residency program directors' perspectives in the selection of applicants for interview and subsequent ranking for residency match. This study reviewed and analyzed secondary database of the Program Director Surveys published by the National Resident Matching Program from 2018 to 2021.

RESULTS: For all residency specialties, between 2018 and 2021, on average, 39% of the program directors cited research involvement as a factor for selection for interview and 29% ranking the applicant for the match. In 2018, the mean ratings of importance for research involvement as a factor for interview invitation and ranking for residency match were similar. However, the mean importance ratings were higher for applicant rankings for residency match compared with those for interview invitation in 2020 and 2021. In 2018 and 2020 surveys, the percentage of program directors who reported involvement in research as a factor in selecting an applicant for interview varied widely among the specialties. The percentage of program directors who cited involvement in research as a factor for ranking the applicants was generally lower than those for invitation for interview among most of the specialties, but Internal Medicine Pediatric in 2018 as well as Psychiatry, Pediatrics, and Radiology-Diagnostic in 2020 showed an opposite trend.

CONCLUSION: In conclusion, while medical residency program directors recognize the importance of research involvement in selecting applicant for the match, there is a wide variation among specialties. Future studies should be directed at understanding the reasons and effects of these variations.

LGBTQ + CURRICULUM IN MEDICAL SCHOOL: VITAL FIRST STEPS

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PURPOSE: Medical school curriculum increasingly incorporates educational content that prepares graduates to address healthcare needs of the LGBTQ + community. A necessary starting point for this curriculum is a cultural literacy session that provides medical students a uniform, fundamental education on definitions, language, and other verbal and non-verbal communication relevant to the LGBTQ + community.

METHODS: A novel 1-h session was delivered in the Fall 2021 College of Medicine orientation week to establish baseline LGBTQ + cultural literacy for incoming students. Learning objectives incorporated defining sexual orientation, gender, sex assigned at birth, gender identity, and gender expression; describing identities within the acronym LGBTQ +; listing inclusive vocabulary options; describing strategies to recognize and mitigate personal implicit biases about LGBTQ + patients; listing preferred pronoun options; describing ways to initiate conversations about preferred pronouns; describing active and passive ways to provide allyship towards LGBTQ + individuals during a clinical encounter; and listing LGBTQ + resources for future patients and self-education. Didactic delivery alternated with actor scenarios, specifically scripted to demonstrate inappropriate and/or insensitive physician verbal and non-verbal communication with patients in the LGBTQ + community, paired with a follow-up demonstration that allowed for a more positive and affirmative approach.

RESULTS: Pre- and post-course Likert-style questions distributed to students allowed them to self-reflect on their knowledge of the content and comfort level in engaging in the interactions presented. Comparison of all paired question sets showed a statistically significant increase ($p < 0.001$, t-test) in knowledge and comfort levels after the session.

CONCLUSION: Medical school education is evolving to address the healthcare needs of the LGBTQ+ community. A cultural literacy program offers a vital first step in establishing baseline knowledge and communication skills essential for competent, affirmative patient interactions.

TRANSITIONING MEDICAL STUDENTS DURING THE GLOBAL COVID-19 PANDEMIC TO COMPLETE SERVICE-LEARNING BY HELPING WITH TESTING AND VACCINATION CLINICS

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PURPOSE: Due to the COVID-19 pandemic, community partners were forced to restrict medical students from participating in service-learning opportunities as a part of the Service-Learning and Community Engagement (SLCE) course at Oklahoma State University College of Osteopathic Medicine (OSU COM). Because of our inability to have students in the community, there was a need to transition the medical students from our typical community-based experiential education to a focused initiative that was safe, impactful, relevant, and educational. We did this by creating service-learning opportunities for our students at COVID-19 vaccination Clinics both in Tulsa and in Tahlequah, OK.

METHODS: New experiences were required for the SLCE course. There was also a developing need in the community to provide locations for the distribution of COVID-19 vaccinations. OSU COM in Tulsa partnered with OSU Medical Center while OSU COM CN partnered with the Cherokee Nation Health Services in Tahlequah to create vaccine clinics. Students assisted with administering the vaccination, patient form completion, running supplies, and monitoring the patient observation areas. Students were required to complete six 2-h sessions. Sign-Up Genius was utilized to create the schedule and select times throughout the semester that fit with our students' courses. Communication was vital to ensuring a positive learning experience for students and ensuring the service provided was adequate and helpful.

RESULTS: There were 170 first-year medical students in SLCE I for the Spring 2021 semester. End-of-course reviews suggested positive learning experiences that include an enhanced understanding of the importance of health promotion, using skills to help the community, and feeling like they were part of a larger healthcare professional community. SLCE students assisted with the administration of about 13,500 COVID-19 vaccinations.

CONCLUSION: Transitioning our medical students from our typical service-learning activities to the vaccination clinics was a worthwhile and practical measure that benefited the community and the learning experience of our students.

UTILIZATION AND EFFICACY OF QUIZ-ENHANCED VIDEOCASTS FOR BASIC SCIENCE CONCEPT REVIEW IN CLINICAL COURSES

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PURPOSE: Reviews of basic science concepts are important parts of integrated clinical courses. However, students often perceive these reviews as loaded with redundant and excessively detailed content. A review of DMU second-year courses suggested that a review of relevant basic science concepts and disorders could be conducted in significantly less time than the currently scheduled hour-long lectures. The current study was undertaken to determine the efficacy and utilization of short, quiz-enhanced videocasts (QEVs) for the review of Biochemistry in second-year clinical systems courses.

METHODS: The content of 7 selected Biochemistry review lectures in DO and DPM programs was reduced to relevant, non-redundant material based on a thorough review of the DMU curriculum and publicly available information on licensing exam content. Short, scripted presentations with embedded quizzes were recorded as QEVs and offered as alternatives to corresponding full lectures. IRB approval was obtained to track download patterns of QEV/lecture recordings and for collecting student impressions of the effectiveness of QEVs via anonymous survey.

RESULTS: Surveys and download data show that when QEV and lecture are offered as alternatives, the plurality of students utilize both content delivery methods. Lecture and QEV utilization patterns showed significant differences: While lecture downloads peaked shortly after the live lecture, QEV streaming peaked in the days immediately preceding the exam. Students comment confirm the full-hour lectures are used for an initial survey of the topic while QEVs are often utilized for exam preparation. Qualitative analysis of student comments show that QEVs are seen as very useful, effective, and time-saving additions to the curriculum.

CONCLUSION: Concise reviews of basic sciences are clearly a valued addition to the second-year medical curriculum. While some students prefer to attend full-length lectures, most students rate the videocast format as the most effective means for topic review, particularly for focused exam preparation.

HOLISTIC RECRUITMENT 2.0—A NEW VIRTUAL REALITY

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PURPOSE: According to the Association of American Medical Colleges, the practice of holistic admissions for student selection has gained popularity, as it permits evaluation of a broader range of criteria important for student success and the selection of individuals with the background and skills needed to meet the demands of our health care environment. Having providers similar in important dimensions of individual identity enables communication and improves the provider-patient relationships. The practice of holistic admissions requires not only process change, but also training for individuals involved in the selection process. The pandemic has strained many usual methods of communication and training, forcing changes to selection processes for programs.

METHODS: A top-tier Physician Assistant program changed their selection process to include holistic review, updating applicant scoring rubrics to include mission-aligned goals. The program introduced training to systematically create an objective review of applicant. Information sessions were converted to an online platform. During the pandemic, the program created a virtual interview process to include interaction with current students and faculty. The interview process introduced panels that reflected the student body diversity and targeted mission-aligned priorities.

RESULTS: Pre-holistic data showed the program lacked consistency reaching targeted populations such as those with significant leadership or military experience and those underrepresented in medicine. Aggregate post-holistic data indicated maintenance of high academic metrics, while increasing variety of mission-aligned experiences and attributes to their enrolled cohort. Qualitative data suggest virtual interview sessions yielded similar satisfaction with in-person admissions process.

CONCLUSIONS: This program successfully adapted their selection process to target mission-aligned attributes of applicants. Through holistic review, standardized training, and virtual interviews during a pandemic, the program mirrored the successes of their previous in-person experience.

BENEFITS & CHALLENGES OF ASYNCHRONOUS TEAM-BASED LEARNING APPROACHES TO GRAY-AREA COURSE CONTENT

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PURPOSE: Describe an approach in combining team-based learning and inquiry-based learning to implement a bespoke approach to asynchronous course design for subjective course content. This innovation is relevant within the current climate of increased demand for online learning opportunities which reach diverse audiences unable to participate in traditional learning schedules/settings.

METHODS: Team-based learning (TBL) is an active learning and small group instructional strategy using individual and team readiness activities receiving immediate feedback. TBL is assessed in face-to-face settings with "objective" course content (clear correct responses) (Parmelee et al., 2012). Less understood are the ways TBL is conducted in asynchronous learning environments and how it can be modified for "subjective" or gray-area course content such as current issues in medical and health professions education. To convert TBL online course context, including collaboration methods and the space/time of the online course must dominate design choices. Instructors consider what data are used to determine TBL model efficacy and how students will demonstrate engagement and learning (Dorneich et al., 2021). Little research is available to address TBL in subjective contexts; therefore, this innovation project used a theoretically similar pedagogical approach, IQL to promote formulating questions, hypothesizing, investigating, and applying (Pedaste et al., 2015).

RESULTS: This course design exposed future educators to a unique learning environment that may inform their future teaching practices. Students reported appreciation for the design, clear expectations, exposure to multiple points of view, opportunities to collaborate with peers, and autonomy. Lessons learned through this innovation include appropriate technology, choice, and level of involvement with team conversations for the instructor.

CONCLUSION: The asynchronous tools may be useful for those teaching online courses of objective content, and faculty involved with courses that promote thinking and decision-making in subjective courses may benefit from the innovative TBL/IQL combination.

EFFECTS OF STUDENT SOCIOECONOMIC STATUS ON ACADEMIC BENCHMARKS IN MEDICAL SCHOOL

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PURPOSE: The objective of this study was to determine if socioeconomic disadvantage status was correlated to lower MCAT scores and academic benchmarks in medical school. Students from lower socioeconomic groups have been shown to underestimate their ability to get accepted to medical school or be successful once accepted. Prior studies have shown that a higher socioeconomic disadvantage status resulted in lower NBME Step scores. However, more research is needed to determine if these are institution-specific issues or a nationwide problem.

METHODS: Data for this study were drawn from institutional databases in accordance with an approved IRB protocol. The AAMC education/occupation (EO) indicator classifies applicants into five ordered groups. EO1 and EO2 are determined as economically disadvantaged, so we aggregated EO1 and EO2 status of KKSOM students. The disadvantaged groups were then compared to students with no financial disadvantage (using independent-sample t-tests) on the following test scores: MCAT, mean of all preclinical NBME subject exams, step 1, mean of all clinical NBME subject exams, and step 2.

RESULTS: Medical students in the disadvantaged group were found to have significantly lower MCAT scores than their counterparts. The disadvantaged group showed a non-significant lower trend on all benchmarks until step 2 at which point they were higher compared to their wealthier classmates.

CONCLUSION: These results suggest that applicants from lower socioeconomic backgrounds who do poorly on the MCAT can be accepted with the expectation that they will catch up with other students. More multi-institutional wide studies need to be done to determine the generalizability of these findings.

APPLYING COGNITIVE INTEGRATION: A NOVEL ASYNCHRONOUS FOUNDATIONAL SCIENCE CURRICULUM FOR MEDICAL STUDENTS DURING CLERKSHIPS

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PURPOSE: Cognitive integration (CI) connects foundational science (FS) to medical practice and improves clinical reasoning. While evidence supports CI in medical training, the clinical relevance of FS is often obscure to medical students, and few learning materials exist to support CI during clerkships. Providing effective and engaging tools to promote CI may enhance understanding of the clinical relevance of FS. We therefore aimed to create an online module to integrate FS into clerkships.

METHODS: Previous student feedback at our institution advocated for clinically relevant FS content. Applying Cognitive Theory of Multimedia Learning principles, we (an oncologist, a biochemist, and an instructional designer) created a cancer module grounded in the hallmarks of cancer (HoC), a key FS principle. To emphasize clinical relevance, we recorded patient interviews incorporating FS. The module, composed in Qualtrics, includes an introduction and four vignettes, each starting with a brief patient interview, followed by clinical text, images, questions, and

explanations. Content co-created by the oncologist and biochemist combined clinical and FS perspectives while referencing HoC throughout. The evaluation plan includes written learner feedback, a case-based pre/post-test, and review of clerkship assessments for evidence of CI.

RESULTS: Module completion takes 2 h, which can be divided into multiple sittings. Filming and editing cost $100/h. The project required approximately 60 faculty person-hours and 12 instructional designer person-hours. Interviewed patients expressed gratitude for sharing their stories with students.

CONCLUSION: This novel interactive module can serve as a model for development of clerkship curricula promoting CI. Module creation based on real patients resulted in authentic story-telling and enhanced FS relevance. Content development involving a clinician and a basic scientist aligned with CI goals. Limitations include the need for funding and instructional design assistance. For future iterations, involving learners in curriculum development may decrease faculty burden and increase student interest in FS.

PIPELINING HEALTH SYSTEMS SCIENCE IN POST-BACCALAUREATE PREMEDICAL PROGRAMS

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PURPOSE: Health System Science (HSS) is recognized as the third pillar of medical education that teaches how systems of health are designed, delivered, and impact populations. Undergraduate medical education (UME) has incorporated HSS into their curricula, yet reported mixed student receptivity and engagement. Anchoring prospective medical students to HSS prior to matriculating into UME could not only improve the receptivity of HSS among medical students but also afford applicants to medical school the opportunity to demonstrate how their own lived experiences will contribute to a more diverse school culture and physician workforce.

METHODS: Through a 1-year academic record-enhancing postbaccalaureate premedical (PBPM) program, we introduced HSS to the 25 student cohort during their first biomedical science course and evaluated for curriculum feasibility and student satisfaction. The HSS thread incorporated asynchronous free online modules produced by a national group of HSS educators, followed by a required graded reflection at the end of the training.

RESULTS: Incorporating HSS into our PBPM program was well received by the postbaccalaureate students, as reported by 100% of student reflections and a desire to learn more about HSS. Students found HSS content easily relatable

to themes in medicine, reported a clearer understanding of social determinants of health, and expressed increased motivation in becoming patient advocates by volunteering in our student-run free clinics, which we have implemented for the remainder of the program. We found our curriculum intervention feasible and appealing to students because the resources were publicly available, high quality, and validating of personal experience.

CONCLUSIONS: We learned that pipeline PBPM programs provide an optimal environment to introduce premedical students to HSS content for many reasons: one that students are highly committed to becoming successful patient advocates before applying to UME, and another that pipeline PBPM programs are able to facilitate applied learning experiences through student-run free clinics.

BRAVE NEW E-WORLD: MEDICAL STUDENTS' PREFERENCES FOR AND USAGE OF ELECTRONIC LEARNING RESOURCES DURING TWO DIFFERENT PHASES OF THEIR EDUCATION

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PURPOSE: E-learning strategies have become an essential part of medical education. However, how and why medical students select hardware tools and software formats during their pre-clinical education has not been sufficiently analyzed and documented. Insight into e-learning resource utilization by medical students will help educators and medical schools to decide which resources to offer to their students.
METHODS: Two medical school classes at a major US medical school were surveyed about their use of e-learning resources during either their first year of medical school or their preparation for their first licensing examination (USMLE ® Step 1). Their responses were analyzed for patterns and significant changes.
RESULTS: Students' answers indicated that computers and tablets were considered most important to support students' learning. During the first year, students often preferred resources that were tailored to the specific courses in their curriculum. In contrast, some preferences changed when students prepared for the USMLE ® Step 1, with students shifting almost exclusively to commercial e-learning resources and adopting a solitary learning strategy. Across all phases of medical school education queried, peer advice was the major determinant influencing e-learning resource selection, videos were the most popular e-learning modality, and students cited efficient acquisition of knowledge and preparation for examinations as major reasons for e-learning tool utilization.

CONCLUSION: Students' e-learning resource preferences differ by academic year, indicating that e-learning resources likely serve specific tasks, such as preparing for examinations. Additionally, a major determinant influencing e-learning resource selection was peer advice, with faculty only playing a minor advisory role. These factors should be considered when offering e-learning resources to medical students during different phases of their training.

DIVERSITY AMONG THE IAMSE MEDICAL EDUCATOR FELLOWSHIP PROGRAM GRADUATES

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PURPOSE: The International Association of Medical Science Educators (IAMSE) launched The Medical Educator Fellowship Program in 2010 to develop medical education scholars and leaders. The program operates currently in three phases: (a) completion of the AMEE Essential Skills in Medical Education course, (b) participation in 12 h of related and preapproved faculty development workshops, and (c) presentation of a mentored capstone research project. However, there is limited data about the program outcomes. In this study, we examined the diversity among the program graduates.
METHODS: This study reviewed the profiles of the IAMSE Fellows between 2010 and 2021. We utilized data published on the IAMSE website, Medical Sciences Educator Journal, and other public websites to gather demographic, geographic distribution, terminal degree, and specialty information of the IAMSE Fellows.
RESULTS: During the period 2010–2021, the IAMSE fellowship program inducted 40 Fellows, of which (62.5% $n = 25$) were females. Terminal degrees distribution among the Fellows was Ph.D. (55%), M.D. (25%), and M.D./Ph.D. (15%), M.S. (2.5%), and EdD (2.5%). Geographically, the Fellows were in North America (72.5%), Asia (10%), South America (7.5%), Europe (5%), and Australia (5%). Most of the Fellows (62.5%) work in the USA, mainly in the northeastern and southeastern states. The Fellow's affiliations included allopathic medical schools (77.5%), osteopathic medical schools (15%), and physical therapy (2.5%), arts and sciences (2.5%), and chiropractic (2.5%). The Fellow's scientific specialties included basic sciences (72.5%) and clinical sciences (27.5%). Thirty-seven fellowship capstone projects were identified and focused on teaching methods and strategies (46%), assessment (38%), and curriculum design (16%).
CONCLUSION: The IAMSE fellowship program graduated a diverse group of health sciences educators and scholars.

Future studies will assess the impact of the fellowship on the Fellow's scholarship, teaching, academic promotion, and leadership activities.

FACTORS INFLUENCING PA STUDENT ATTRITION

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PURPOSE: The aim of this study was to assess factors that influence physician assistant (PA) student well-being and attrition, and to compare faculty perceptions to the realities of the PA student experience.
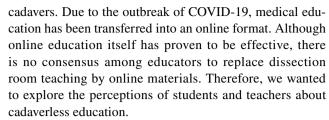
METHODS: Three anonymous online surveys were distributed to 4 PA programs, one for each group of currently enrolled students, faculty/staff, and attritted students. Due to the staggered start dates of the included PA programs, students are at various stages of their PA training. We collected and reviewed participant data using a combination of descriptive statistics, independent samples t-testing, and chi-square testing. All analyses were performed using SPSS Statistics Version 25 and an alpha of 0.05.

RESULTS: A total of 276 current students (276/462, 59.7%), 24 faculty and staff (24/41, 58.5%) and 6 attrited students (6/26, 23.1%) consented to the survey. Faculty estimated that an average of 12.8% of PA students in their program have considered dropping out in the past 6 months, while 22.9% of students self-reported considering dropping out in the past 6 months. The most frequently cited factors for considering dropping out were mental health and lack of connection to the program. Mental health was the highest cited reason for having taken or having considered taking a leave of absence.

CONCLUSION: Faculty perceptions were incongruent with the actual situations of their students. Mental health issues and a lack of connection to programs are the largest influencers of attrition. Given the challenges faculty have in attempting to identify students that are struggling with mental health, loneliness, or of dropping out, it is important for programs to realize that the scope of the problem is likely larger than they anticipate. Improving social connections and support both within the cohort and between faculty/staff and students has the potential to improve student wellness, mental health, and retention in PA training.

PERCEPTIONS REGARDING CADAVERLESS ONLINE ANATOMY EDUCATION

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PURPOSE: One of the biggest impacts of anatomy education is the opportunity for medical students to learn from cadavers. Due to the outbreak of COVID-19, medical education has been transferred into an online format. Although online education itself has proven to be effective, there is no consensus among educators to replace dissection room teaching by online materials. Therefore, we wanted to explore the perceptions of students and teachers about cadaverless education.

METHODS: The study was conducted at the Faculty of Medicine at Hasanuddin University, South Sulawesi, Indonesia, between June and August 2021. All first year medical students were invited to participate in a focus group interview after attending online anatomy sessions. Additionally, teachers who teach anatomy in the first year were invited for an individual interview with the primary investigator. Interviews were conducted in the Indonesian language, recorded, and transcribed. Thematic analysis in this study was done based on guidance by Braun and Clarke (2006).

RESULTS: We performed three focus group sessions of 12 students each, and 12 individual interviews with teachers. Analysis of the interviews yielded 4 main themes: Quality of Learning; Confidence/concerns in Knowledge and Skills; Ethics and Identity as a future physician; and Economical aspects. We found that students were worried and skeptical about the quality of the online education, as well as their capacity to practice medicine in the future without having experienced cadavers. On the contrary, teachers feel there is no difference between online and offline teaching as long as they can transfer knowledge in an interactive manner. Some teachers doubt student's ability in psychomotor skills due to cadaverless teaching.

CONCLUSION: In this study, we discovered that students and teachers have different perspectives on cadaverless anatomy education. It is important to take both perspectives into consideration in developing future anatomy learning programs.

CASTING A WIDER NET: INCREASING INCLUSIVITY AND DIVERSITY IN FACULTY SEARCHES

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PURPOSE: While calls to diversify the healthcare workforce have grown louder, many areas of medical education have not adequately responded. In 2018, only 3.6% of full-time medical school faculty were Black or African American, and only 5.5% were Hispanic/Latino/of Spanish Origin. A diverse healthcare workforce is associated with improved outcomes across the board. At the educational level, a diverse student body improves the learning of all students, and a diverse faculty is better able to support underrepresented students and build inclusive learning culture. This abstract presents one program's effort to conduct a more equitable faculty search and recruit candidates in alignment

with the program's values of diversity, justice, equity, and inclusion.

METHODS: A multi-faceted approach was taken to reduce bias and increase equity within a faculty search. Program leadership provided the search committee chair with this specific charge, and the process began with selection of a diverse committee membership. Members engaged in anti-bias training and bias checks became a standing item for all committee meetings, built into every step of the search. Strategies such as blinding CVs and creating a robust candidate evaluation rubric led to processes and tools that can be applied to future searches.

RESULTS: The search resulted in 14 applicants, 4 interviewees, and 2 hires. Candidate feedback was positive and indicative of increased equity. Despite our best efforts to mitigate bias, we were unable to eliminate it, but we were able to identify and disrupt it. Several tools developed in our process represent successful outcomes that are already being applied to other hiring processes.

CONCLUSION: Deliberate actions to address bias in academic processes is critical to promoting more diverse healthcare faculty, and building student pipelines that advance health equity. While our interventions were limited to one faculty search process at one institution, there are important lessons that may be applied to hiring, admissions, and awards selection.

UTILITY OF MINI-CEX FOR DIRECT OBSERVATION OF UNDERGRADUATE MEDICAL STUDENTS AT THE AGA KHAN UNIVERSITY

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PURPOSE: In a clinical setting, direct observation (DO) and its feedback are considered an effective method to evaluate and improve a medical students' performance. One such tool for assessing clinical competency via DO is the mini-clinical evaluation exercise (Mini-CEX). We conducted a pilot study to assess the feasibility and effectiveness of using Mini-CEX for DO of medical students in the undergraduate medical program at the Aga Khan University.

METHODS: Our study was conducted throughout an entire academic year, with a total of 6 core clerkships selected from years 3 and 4. All participating faculty from each department underwent mandatory training workshops for use of the tool and feedback strategies. Each student was assessed twice within one clerkship by one faculty, using a modified version of the Mini-CEX, and feedback was given after each DO. All stakeholders gave feedback on the process of DO via Mini-CEX at the end of the study.

RESULTS: We obtained three sets of results: Mini-CEX forms (282), student (70), and faculty (18) feedback. Overall, year 4 students performed significantly better in every aspect of evaluation, i.e., data gathering ($P = 0.011$), communication of history/physical examination ($P = 0.003$), diagnosis/differential and management plan ($P = 0.034$), and organization of information ($P = 0.010$). Furthermore, students improved significantly in all areas of assessment in their 2nd evaluation ($P < 0.001$). While students (65.7%) and faculty (94.4%) alike felt this exercise substantially improved their mutual interaction, only 27.1% of students recommended formal implementation of this pilot compared to 83.3% faculty, reporting feelings of intimidation from observation itself. Other challenges identified were time constraints, logistical issues, subjectivity, and varying interest from faculty.

CONCLUSION: Opportunities for direct observation and feedback can help improve clinical and diagnostic skills of medical students and strengthen their interaction with faculty. This ensures the quality of teaching, learning, and assessment processes, helping students achieve competency-based outcomes within the curriculum.

IMPACT OF NEAR-PEER SURGICAL ANATOMY TEACHING PROGRAM ON MEDICAL STUDENT SELF-EFFICACY AND CONFIDENCE: LEARNER AND TEACHER PERSPECTIVES

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PURPOSE: As many medical schools have reduced the time devoted to traditional cadaver-based anatomy, new teaching methodologies, such as 3D anatomy tables and virtual reality, have been developed to counteract these changes. However, many surgeons believe the cadaveric gross anatomy lab is essential to gaining basic dissection skills and understanding of anatomic relationships. We developed the Clinical Anatomy Mentorship Program (CAMP), which is a novel near-peer surgical anatomy teaching program using Thiel-embalmed cadavers. This project describes the successful implementation of CAMP into the KU School of Medicine Surgery Clerkship curriculum and its outcomes.

METHODS: This was a prospective quantitative and qualitative study. All third-year medical students (M3s) at KUSOM on their surgery clerkship were eligible for inclusion for the learner cohort, $n = 106$. A group of fourth-year medical

students (M4s) self-identified as CAMP mentors were eligible for inclusion for the teacher cohort, $n = 40$.

RESULTS: M3s have higher self-efficacy scores ($t = 16.61$, $p < 0.001$, ES $= 1.62$) after participating in CAMP, with scores increasing by an average of 6.6 points (95% CI 5.8–7.4). Among 429 open-ended comments written by M3s, significant themes highlighted that CAMP taught them a much-needed refresher on anatomy, gave them an introduction to surgical anatomy and the operating room, and felt peer-to-peer teaching created a safe environment to ask questions. M4 mentors reported statistically significant increases in self-efficacy, confidence in teaching skills, and grit scores after teaching CAMP sessions throughout the academic year ($p < 0.001$). Among 113 open-ended comments written by M4 mentors, significant themes highlighted that CAMP helped them develop their teaching skills and surgical confidence.

CONCLUSIONS: We designed CAMP to address specific medical student needs for a surgically oriented anatomy and procedural skills curriculum. CAMP has enhanced self-efficacy, anatomy knowledge, and operating room exposure in M3s, and self-efficacy, teaching skills, surgical anatomy knowledge, and surgical confidence in M4s.

INCREASING MOTIVATION FOR RESEARCH AND SCIENTIFIC REASONING SKILLS IN UNDERGRADUATE BIOMEDICAL STUDENTS USING INQUIRY BASED AND TEAM BASED LEARNING

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PURPOSE: To introduce first-year students in the Biomedical Science program at Leiden University Medical Center (LUMC) to scientific reasoning, a 10-day introductory course on the topic of skin cancer is offered. In order to further enhance student initiative, curiosity, motivation and self-regulating skills, a combination of inquiry based learning (IBL) and team based learning (TBL) was introduced in 2020 and 2021. Both courses were delivered online due to COVID restrictions. In this study, we report on how the students perceive their abilities, motivation and performance in the research activities offered.

METHODS: A validated self-efficacy questionnaire was offered to the students before and after the course. To systematically evaluate the intervention, the outcomes of the LUMC course evaluations tool (GOES) over the years 2018 and 2019 (pre-intervention) and 2020 and 2021 were used.

RESULTS: Outcomes of the GOES show that students in 2020/2021 had a better understanding of the course subject skin cancer. Knowledge enhancement in the workgroups and

activation in learning activities scored significantly higher in 2020 and 2021, compared to previous years. The TBL format was well received and allowed for optimum interaction, peer learning and acquaintance. In 2020 and 2021, students filled out the self-efficacy questionnaire before ($n = 135$) and after the course ($n = 76$). Over the course, students' scores significantly increased on three aspects: "research activities challenges me"; "I see multiple solutions when seeing a problem'; and "I am busy solving problems which I think should be solved".

CONCLUSION: We observed that students rather quickly picked up the skill of defining research questions and were able to deepen their eagerness for more biomedical knowledge by team-based learning. Introduction of IBL and TBL stimulated self-regulation aspects such as autonomy, sense of competence and relatedness to peers, resulting in an early authentic, undergraduate research experience with more active and motivated students.

DISCONTINUATION OF STEP 2 CS: AN OPPORTUNITY TO REINTRODUCE FORMATIVE CLINICAL SKILLS EXAMINATIONS FOR PRE-CLINICAL MEDICAL STUDENTS

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PURPOSE: Medical schools employed high-stakes clinical skills examinations (CSE) to prepare learners for step 2 CS which unintentionally increased learner anxiety. Discontinuation of step 2 CS provided the opportunity to reintroduce formative clinical skills examinations (FCSEs) for preclinical medical students to provide real-time, individualized feedback and decrease anxiety induced by high-stakes assessments.

METHODS: We reintroduced FCSE for preclinical medical students with the following format: students (1) gather a history from the SP, (2) complete a post-encounter assessing diagnostic hypotheses and hypothesis-driven physical diagnosis, (3) perform a hypothesis-driven physical exam, (4) complete post-encounter assessing clinical reasoning and documentation, (5) participate in debrief and coaching with the SP and a faculty observer. Students receive an individualized clinical skills formative feedback report inclusive of post-encounter and checklist performance, plus narrative faculty feedback.

RESULTS: FCSEs were reintroduced to 103 MS2 students in October 2021. Students provided overwhelmingly positive qualitative feedback. Eighty-five percent of students reported a decrease in anxiety compared with prior summative assessments. FCSE performance will be compared to historical performance on these linked encounters, previously administered as 2 stations in a summative CSE,

to confirm the switch to formative did not impact student performance.

CONCLUSIONS: FCSEs were well received by students and decreased student anxiety levels. Students received real-time feedback on multiple clinical skills domains, including communication, clinical reasoning, and physical diagnosis. We have not yet assessed the impact of FCSE on longitudinal performance. FCSE require significant faculty and SP time and training that may pose a limitation for some institutions but would be easily transferable to schools currently employing summative CSE.

PEER-ASSISTED LEARNING IN UNDERGRADUATE MEDICAL EDUCATION FOR RESILIENCY AND WELL-BEING

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PURPOSE: Medical students and physicians experience a high rate of mental health challenges. Peers provide foundational support for assisting with these stressors. Peer-assisted learning (PAL) is a learner-led training model that encourages collaborative educational experiences. Given that the effective practice of medicine involves lifelong collaborative teaching and learning, introducing PAL models of resiliency early in a trainee's career may provide myriad personal and professional benefits.

METHODS: During pre-clerkship training, we utilize many ways of peer learning. As part of our medical student well-being program, we created a PAL session during year 1 orientation. Peer coaches (year 2/3) were trained to utilize heart rate variability (HRV) and heart-focused breathing for emotional self-regulation and coherence to better coach their peers. Students were introduced to the concepts of coherence, HRV, and techniques for developing self-regulation.

RESULTS: Sixty first-year students participated in pre- ($n = 56$) and post-surveys ($n = 51$). Questions focused on (1) goals, (2) expectations, (3) challenges and (4) strategy use. Seventy-five percent ($n = 38$) of the post-survey respondents indicated goals were met, including strategies for stress management, wellness and making connections with peers. Eighty-eight percent ($n = 44$) indicated expectations were met, particularly learning strategies for wellness. Eighty-two percent ($n = 42$) reported challenges were addressed, ranging from having a safe space to share and practice to techniques that can be integrated into busy schedules. Almost all respondents (96%, $n = 49$) shared how they anticipated using the strategies during stressful situations and to include the practices daily.

CONCLUSION: The program described in this report is an innovative approach to assisting first-year medical students with the transition into a medical career. A major goal was to train emotional self-regulation for developing resiliency and well-being. Discussions promoted connections between and among coaches and learners, helping initiate a supportive network that will serve all constituencies.

IT'S NOT IN THE BOOK: GUIDING YOUR LEARNERS THROUGH THE PROCESS OF RESEARCH

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University of Nebraska Medical Center | University of Nebraska Medical Center

PURPOSE: Medical education faculty are expected to participate in scholarly activity throughout their career and support learners by providing research mentoring. Balancing this with the rigor and rapid evolution of teaching is often challenging. The purpose of this presentation is to outline a structure that was implemented at our institution to guide learners independently through the process of research.

METHODS: Medical students typically enter our program with prior exposure to research; however, this experience is often limited to the data collection phase of a project. The structure and workbook allow independent learning to support mentors who do not have time to teach a student "how" to conduct a project from conception to dissemination. This program includes information not typically "in the book" of a traditional research methods course. The steps and supporting materials cover the challenges of filling a gap in the literature to boost the opportunity for international publication. Additionally, students learn the importance of using research results to guide a reader down a logical path from introduction to conclusion.

RESULTS: The workbook and supporting materials have been used formally to support summer research programs and enrichment courses for 30 undergraduate and medical students. The fourth-year medical students participating in our workshop commented, "I wish I had this information in my first year." Popular topics included answering the so what question, techniques to successfully emerge from the literature review rabbit hole, writing in reverse, and choosing a target journal. Faculty appreciate the structure and steps outlined to support mentees through the process of conducting a research project.

CONCLUSIONS: A critical element of medical education is scholarly activity and optimal learning may be achieved by actively participating in research. This structured workbook assists mentors with basic research education so they may focus on the clinical aspects of a project.

HUMANISM IN ANATOMY CADAVER DISSECTION USING STUDENT AND FACULTY REFLECTIONS

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PURPOSE: Human cadaveric dissection is a transformative and symbolic moment in a medical student's education and despite technological advances remains the preferred method of anatomical education for most medical schools today. The process of cadaveric dissection can be a positive empathy-building experience for some, while being emotionally distressing for others, as it simultaneously provides many students with their 'first patient' experience and the reality of death. As students have diverse needs and experiences prior to entering an anatomy lab, discussions and reflections should start before the first dissection to facilitate emotional preparation and expectations when working with donors.
METHODS: Upon completion of the clinical gross anatomy course, students at CUIMC were asked to share reflections about their human dissection experience. Students were provided with prompts focused on themes of humanism, advice, memories, and thoughts for the donors or their families. Participants included medical and dental students at Columbia VP&S from the 2022–2024 classes, as well as two faculty members of the anatomy course. The reflections in written and video formats were compiled into an interactive learning module using Articulate Storyline. The online module was then shared with the class of 2025 during orientation prior to their first dissection.
RESULTS: First year medical and dental students at VP&S completed the module and reported that it provided time and space to reflect on what the anatomy experience would be like before their first dissection. During the first lab, observation confirmed that incoming students seemed more open with one another about their feelings concerning the dissection protocol, and direct references to the modules were cited.
CONCLUSION: Student and faculty reflections about cadaver dissection experience through an interactive module enable students at Columbia VP&S to engage in the humanistic aspect of cadaver dissection and be better prepared for their first day of dissection.

PHYSICIAN PERCEPTION OF GENOME SCIENCES EDUCATION AND USE IN CLINICAL PRACTICE

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PURPOSE: Medical practice has been impacted by genome sciences, affecting prevention, diagnosis and management of disease. We wanted to understand physician perceptions regarding the importance of and comfort with the use of genome sciences, as well as their expectations for medical trainees.
METHODS: A retrospective survey was sent to physicians employed by a health system associated with a public medical school. The survey was based upon published reports that used a 5-point Likert scale to assess the physicians' self-reported training in genome sciences as well as their comfort level with ordering and using specific types of genetic testing. Survey recipients were also asked about their expectations for training of medical students and incoming residents in genome sciences. All data were exported to Statistical Package for the Social Sciences (SPSS) v26 for analyses.
RESULTS: Analysis of the responses revealed that despite most physicians having had formal genetics training in medical schools, clinicians reported discomfort in this content area. The majority also believed that the impact of genomic sciences on their practice will increase in the next 5 years. These same physicians expect a high level of competency in genome sciences for medical students and incoming residents. Compounding the sense of being unprepared for the use of genome sciences in clinical medicine, many in our survey also reported limited access to genetics expertise.
CONCLUSION: While more work is needed to assess the specific use of genome sciences and the differences in application among medical specialties, our study revealed that practicing physicians feel the current curricula do not produce physicians with required competency. This is despite the perceived importance of this domain in medical practice. Physician discomfort with ordering genetic studies in the clinic points to a need for effective continuing medical education. Our findings suggest a potential need for expanded, thoughtful genomics education at all levels of training.

DEVELOPING A CONTINUOUS IMPROVEMENT MODEL OF PROGRAM EVALUATION USING A COMPETENCY-BASED APPROACH TO ANESTHESIA SIMULATION TRAINING IN VETERINARY EDUCATION

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PURPOSE: Evaluation of clinical competency, particularly for high-risk activities such as anesthesia management, is a major challenge for healthcare education. We developed a competency-based, immersive anesthesia simulation

program according to a continuous improvement training model to not only evaluate learning but also to inform subsequent training with evidence produced by granular skill data analyses.

METHODS: We designed a competency-based, immersive anesthesia simulation training program for veterinary nurses. Three validated assessment instruments were aligned with the competency-based training and included clinical performance rubrics for four anesthesia scenarios, a self-efficacy inventory, and a procedural knowledge test. All instruments were aligned at the skill level to evaluate specific cognitive, psychomotor, and affective domains required to appropriately manage four common complications in canine anesthesia. A pilot study was conducted at an accredited veterinary technology program to evaluate learning and performance at the competency and granular skill level. This allowed us to identify specific training areas requiring improvement and to provide students with customized skill reports to guide their individual future anesthesia training.

RESULTS: The pre/post-test pilot stage of the study included data from nine first year veterinary nursing students and revealed significant improvement ($p < 0.001$) in self-efficacy, knowledge, and all clinical outcomes evaluated by the standardized, competency-based rubrics. Analyses at the skill level revealed specific skills the group did not acquire, thereby providing a continuous improvement strategy to inform subsequent trainings. Additionally, individualized skill level performance reports were generated to guide subsequent learning pathways.

CONCLUSION: This study describes the development of competency-based training according to a continuous improvement model of program evaluation. In addition to understanding whether training enhances general performance measures, this method provides granular information pertaining to specific skills in anesthesia management and that data can be used to inform and enhance subsequent training methods as well as to create individualized learning pathways.

TEACHING INNOVATIVE, HUMAN-CENTERED DESIGN SKILLS AS A PROJECT DEVELOPMENT METHOD CREATES A COMMUNITY OF INNOVATORS

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PURPOSE: We teach innovative, human-centered design skills through our incubator seed grant program. Participants develop their projects using our experiential-learning pedagogy that teaches them to think like innovators. Our intention is to train participants to think like innovators so they will innovate throughout their professional careers and across our university. We set out to understand if projects were continuing after completing the year-long incubator

program, and if participants were utilizing the innovative skills they learned in work beyond their project.

METHODS: Participants learn and apply 10 innovation skillsets to develop their project. We assess these skillsets on a 6-point rubric and map participants' progress along a learning progression. After training, teams implement and continually iterate their project with the goal of ending the academic year with a program that is viable to be scaled and adopted into the university. In 2021, we surveyed past team leaders to learn if they were using the skillsets they learned in the program in other parts of their work.

RESULTS: Of the 35 project teams in the program over the past 3 years, 33 teams completed the program. Today, 22 of those projects continue to be implemented within our university (63%). Nineteen of the 33 team leaders responded to our survey (59%) where all 19 reported they are applying the innovative skills learned in the program in other parts of their work. One hundred percent report using the skills monthly, and 47% of those participants more than once per week.

CONCLUSION: We have demonstrated that applying innovative, human-centered design is a successful approach to developing projects at our university, evidenced by the 63% continuation rate. We also demonstrated that the innovative skillsets are being transferred to work outside of the program. This suggests participants find value in the skills and therefore apply them in other contexts.

USE OF A NOVEL VIRTUAL REALITY AND TABLET APP TO SUPPORT LEARNING OF ANATOMIC AND PHYSIOLOGIC CHANGES DURING PREGNANCY

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PURPOSE: Traditional approaches to learning human reproductive anatomy and physiology do not convey the dynamic nature of pregnancy. To address this limitation, we developed an interactive reproductive software application for use across virtual reality (VR) or smartphone and tablet devices and integrated its use within a pre-clinical obstetrics course. The following describes its utility in the course while investigating the efficacy and acceptance of VR as a learning tool for pre-clinical medical students.

METHODS: The Carle Illinois College of Medicine built upon existing software called "Road to Birth" (RtB), originally developed at The University of Newcastle. Students were assessed pre-course on their visuospatial ability and surveyed on their technological familiarity. RtB was

integrated into the course as a lecture preparatory tool, problem-based learning session resource, method for assessment, and as a supplemental resource. Students also engaged in weekly surveys, end of course focus group discussions, and NBME-style quizzes.

RESULTS: Nineteen students participated in the study. Students performed high on visuospatial ability but reported no VR recreational use. Post-survey responses demonstrated that 63% of the students felt the app increased their knowledge; however, only 32% felt the app was a good use of their time. Average weekly in-app quiz performance was 83%, comparable to NBME-style quiz performance of 79%. Students reported perceiving VR as inefficient; however, actual time to complete the in-app quiz did not drastically differ (tablet: 13.9 ± 5.3 min, VR: 12.4 ± 4.9 min). This perceived inefficiency warrants further exploration of how these technologies can be more effectively and intentionally used in medical education.

CONCLUSIONS: Our findings demonstrate that technologically advanced educational materials are generally supported by medical students and can be successfully integrated as a multi-modal curricular tool. However, educators should consider the time required to use such tools and student prior perceptions as these factors heavily influence student preferences and use patterns.
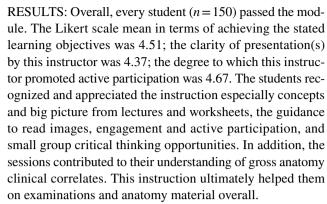
INTEGRATION OF MEDICAL IMAGING IN THE FIRST YEAR OF MEDICAL CURRICULA

Alberto Musto | Natascha Heise | Jessica Bergden | Lane Forney | Matt Myers | Richard Gonzalez
Eastern Virginia Medical School | Eastern Virginia Medical School | Eastern Virginia Medical School | Eastern Virginia Medical School | Eastern Virginia Medical School | Eastern Virginia Medical School

PURPOSE: The utilization of medical imaging benefits medical students by enhancing their learning and understanding of anatomy and ability to interpret clinical cases through radiologic studies. Medical imaging sessions were integrated as a major component of the human anatomy experience within the first year human anatomy at Eastern Virginia Medical School.

METHODS: Integration of medical imaging consisted of (a) recorded lectures using different medical imaging modalities to cover each anatomical region; (b) worksheets using a clinical case to practice content from lectures; and (c) weekly small group sessions during anatomy laboratory supported by multimedia devices, where different medical imaging modalities were discussed using normal and pathological cases. In addition, iPad was used to retrieve medical imaging material during the cadaver dissection case presentation. Assessments were conducted using formative quizzes and summative examinations. Students' perceptions were analyzed using Likert's scale at the end of the module.

RESULTS: Overall, every student ($n = 150$) passed the module. The Likert scale mean in terms of achieving the stated learning objectives was 4.51; the clarity of presentation(s) by this instructor was 4.37; the degree to which this instructor promoted active participation was 4.67. The students recognized and appreciated the instruction especially concepts and big picture from lectures and worksheets, the guidance to read images, engagement and active participation, and small group critical thinking opportunities. In addition, the sessions contributed to their understanding of gross anatomy clinical correlates. This instruction ultimately helped them on examinations and anatomy material overall.

CONCLUSION: This instruction positively impacted the overall students' evaluation. Basic concepts of medical imaging through human anatomy and its relevant clinical application are feasible, effective, and useful for students. Strong expertise in the field and faculty teamwork strengthens educational outcomes. Continued medical imaging integration with other components of the medical curricula need to be evaluated in future studies.

PRESENCE OF LEADERSHIP CURRICULA IN UNDERGRADUATE MEDICAL EDUCATION: FACILITATORS AND BARRIERS TO IMPLEMENTATION OF LEADERSHIP PROGRAMS

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PURPOSE: As evidenced by the COVID-19 pandemic, the United States (U.S.) healthcare system needs leadership from physicians. To be effective, leaders require organizational expertise, teamwork, interpersonal skills, and personal resilience. Leadership education can provide these essential components within undergraduate, graduate, and continuing medical education. The present study aimed to determine the presence of leadership curricula in undergraduate medical education in the U.S and the facilitators and barriers to implementation.

METHODS: A panel of medical leadership educators developed and piloted a web-based survey of all U.S. licensed and accredited allopathic medical schools. Researches used descriptive statistics to determine the presence and perceptions of leadership programs in undergraduate medical education. Implementation barriers were identified qualitatively using free-text responses. The standardized qualitative methodology of emergent theme analysis was used to identify strategies for success and details of support required for implementation.

RESULTS: A total of 41 out of 144 medical schools (28%) responded to the survey. Of those schools that responded, 57% reported a formal leadership curriculum. Primary competencies and goals addressed were similar among institutions. Structure and implementation varied among the responding schools. Primary impediments to implementation were time and financial constraints. Themes of improved communication and integration within the curriculum emerged as the primary facilitators promoting successful leadership curriculum within schools of medicine.

CONCLUSION: The present study demonstrated that the leadership education curricula in UME have remained unchanged over the past 5 to 10 years. Researchers corroborated the need for adequate numbers of well-trained faculty to implement a leadership curriculum successfully. Conceptual frameworks providing a theoretical and practical basis for establishing a program may lead to more successful and desirable programming. Future efforts to provide consensus and best practices through the accrediting institutions should contribute to firmly the educational need for leadership skills training in UME.

BARRIERS TO HELP-SEEKING IN MEDICAL STUDENTS WITH ANXIETY

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PURPOSE: One in three medical students experience anxiety. Anxiety levels in medical students are higher than the general population of young adults yet medical students are less likely to seek health care to treat mental health issues than the general population. Medical students carry high levels of self-stigma about their own mental health and fear negative consequences from seeking care. The purpose of this study was to examine the student population at University of South Carolina School of Medicine Greenville (USC-SOMG) for anxiety levels, and determine the self-stigma attitudes this population carries.

METHODS: USCSOMG students were anonymously surveyed using the GAD7, and open-ended questions that asked students their opinions on barriers to mental health care in medical students. The open-ended questions were categorized by the authors into time, cost, stigma, and difficulty in seeking care. Anxiety levels were compared to categorical responses.

RESULTS: One hundred forty-one students responded to the GAD7, and 31% reported moderate-severe anxiety levels. One hundred seventeen students responded to open-ended questions. The students with minimal-mild anxiety reported stigma as a barrier of care at higher (37% compared to 21%, respectively) rates than students with moderate-severe anxiety levels. In comparison, students with moderate-severe anxiety levels reported time, cost, and difficulty in seeking care at higher rates.

CONCLUSION: Despite free and accessible mental health care, medical students at USCSOMG still have anxiety at rates higher than the general population. Stigma was reported as the largest barrier to care in students with minimal-mild anxiety, while students with moderate-severe anxiety reported stigma at a lower rate, but cost, time, and difficulty in seeking care at higher rates. This work will help to provide interventions to the barriers of care, so medical students can better utilize mental health care resources.

GAMIFICATION ON MEDICAL EDUCATION IN TIMES OF COVID-19: EFFECTS ON MOTIVATION AND STUDENT ENGAGEMENT, AN ALTERNATIVE TO TRADITIONAL LEARNING

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Escuela de Medicina y Ciencias de la Salud, Tec de Monterrey | Escuela de Medicina y Ciencias de la Salud, Tec de Monterrey | Escuela de Medicina y Ciencias de la Salud, Tec de Monterrey | Escuela de Medicina y Ciencias de la Salud, Tec de Monterrey | Esc

PURPOSE: The COVID-19 pandemic's impact has been immeasurable and has shifted medical education towards the online classroom. The virtual curriculum has posed new challenges to educators and students, as teaching and practice are notably harder to achieve remotely. Prior studies suggest a positive impact of gamification on enhancing students' performance, motivation, and decision-making skills. This study evaluates the students' perception and satisfaction with gamification integration in an online medical course.

METHODS: We conducted a cross-sectional study in a cohort of third-year health sciences students in a medical school in Northern Mexico. First, we implemented Kahoot! ® as our gamification tool as 10-question quizzes during a 5-week online course on history taking and physical examination theory. Finally, a survey with both closed- and open-ended questions assessed the students' perception and satisfaction with gamification integration in the online course.

RESULTS: Forty-seven students answered the survey, 85.1% were female, and 14.9% were male. Most students reported a better understanding of theoretical concepts (80.8%), and application to clinical scenarios (70.2%), and were more motivated to study theoretical concepts (61.7%) and to keep learning (74.5%). In the open-ended part of the survey, the students reported increased motivation to attend class, considered the intervention a fun, dynamic approach to learning, and received critical feedback from their tutors after each quiz question.

CONCLUSION: The students perceived our gamification-based intervention favorably. If applied to medical

education, it may enhance the students' engagement in the virtual classroom. Future studies comparing gamified groups versus traditional learning methods could help develop new learning strategies across all healthcare disciplines in the COVID era.

IMPROVING THE EFFECTIVENESS OF COMBINING VOICE-OVER POWERPOINT PRESENTATIONS AND REVIEW GAMES FOR DELIVERING BASIC SCIENCE CONTENT TO MEDICAL STUDENTS

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California Northstate University, College of Medicine | California Northstate University, College of Medicine | California Northstate University, College of Medicine | California Northstate University, College of Medicine

PURPOSE: As flipped-classrooms and online teaching become more prevalent in the teaching community, there is a need to determine the effectiveness of these methods. The goal of the project is to improve the combined delivery of voice-over PowerPoint lectures and review games to increase student engagement and learning while evaluating the potential of this pedagogy.

METHODS: Medical students were assigned voice-over lectures prior to in-class or online learning sessions, in which teams of students answered practice exam questions in the form of review games. Students provided both quantitative feedback using a Likert scale as well as suggestions on how to improve the delivery of this pedagogy. The participating students were divided into groups that were exposed to either the voice-overs, review games, or both, followed by formative questions on the material.

RESULTS: In general, students preferred that practice questions were embedded within voice-overs and favored multiple short voice-overs over long voice-overs for a given subject. In addition, the students provided feedback that they also preferred having a brief question-and-answer review of the main points of the voice-over before starting the in-class review game.

CONCLUSION: Overall, students preferred this particular active learning pedagogy over traditional lectures. In addition, the feedback received from students through this ongoing study will continue to be incorporated into the session to improve the delivery of combining pre-assigned voice-overs with the in-class review games. We are not currently able to assess whether voice-overs or review games are more effective at increasing student performance, but this important question will be addressed in future studies. In CONCLUSION, this study has provided beneficial feedback to enhance the delivery of an active learning pedagogy that can be adapted for either in-class or online learning sessions and is relevant to both undergraduate and graduate-level basic science students.

STUDENT LEARNING FROM MULTIPLE ROUNDS OF SELF- AND PEER-EVALUATION DECREASES INITIAL BIAS SEEN DUE TO GENDER

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PURPOSE: Self- and peer-evaluation are commonly used to teach professionalism in medical education. While self- and peer-evaluation can improve professionalism, feedback is influenced by various demographic factors including gender, race, and similarity between the rater and the ratee. Most studies correlate data from a single round of self- or peer-evaluation with a particular outcome or demographic factor. In this study, we tested the hypothesis that students learn from the evaluations provided by their peers to improve the accuracy of their self- and peer-ratings in subsequent rounds of evaluation minimizing the bias that may initially exist based on demographic factors.

METHODS: Self- and peer-evaluation was completed by 86 M1 allopathic medical students. Students worked in teams of six during team-based learning activities. Students evaluated eight skills involved in teamwork for themselves and each of their peers, from which a mean teamwork score was calculated. The difference between student self- and team scores was determined and compared across gender, age, highest degree, gap year duration, and under-represented in medicine status.

RESULTS: After the first round of peer-evaluation, gender was significantly associated with the difference in self- and group-teamwork scores. More females underrated themselves (27.5% female vs 8.9% males), while more males overrated themselves (20% males vs 7.5% females) compared to their group teamwork rating ($p = 0.007$). After the second round of peer-evaluation, a greater proportion of students were within one standard deviation of their peer's ratings (65% females, 71.1% males after round one, versus 80% females and 82.6% males after round two), eliminating the difference initially seen by gender ($p = 0.344$).

CONCLUSION: This suggests that students learned from the feedback provided by their peers to more accurately evaluate themselves and their peers, minimizing the gender bias seen in initial peer-evaluation. This minimizing of bias further increases the value of peer-evaluation for learning professionalism in medicine.

FACULTY AND STUDENTS AGREE THAT TEAM-BASED LEARNING MEETS IMPORTANT GOALS IN MEDICAL EDUCATION

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PURPOSE: Team-based learning (TBL) has been shown to be an effective learning modality, yet student resistance is common. One possible source of resistance may arise when students and instructors do not think TBL is aligned with the important goals of medical education. It is also important for students and instructors to have a similar understanding of the goals of TBL. The purpose of this study was to better understand how well faculty and students perceive that TBL meets important goals of medical education in the preclinical undergraduate medical education curriculum at Western Michigan University Homer Stryker M.D. SOM (WMed).

METHODS: A survey of fourteen possible goals for TBL was developed based on prior literature and thematic analysis of interviews and focus groups with students and faculty. The survey was distributed to the graduating classes of 2021, 2022, and 2023 ($127/239 = 53\%$ response rate), and all basic science faculty ($11/11 = 100\%$ response rate) in the biomedical sciences department. The survey contained three sections pertaining to the goals of TBL at WMed.

RESULTS: Faculty and students are largely aligned regarding the goals of TBL at WMed. Both groups agreed TBL supports most of the fourteen goals. There were statistically significant differences ($p < 0.01$) between how well faculty and students felt TBL supported two of the goals. Students felt the current use of TBL at WMed did not sufficiently support the goal of introducing new content. Faculty felt more strongly than students that TBL helps to prepare students for clerkships.

CONCLUSION: Although faculty and students generally agreed about the importance of the goals identified for TBL at WMed, there were some important differences. An intentional discussion of the process and goals at the start of each course may benefit both faculty and students in terms of cohesiveness and buy-in for the TBL process.

BIASES REVEALED! LIVED EXPERIENCE AND RESPONSES ON THE IMPLICIT ASSOCIATION TEST (IAT)

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PURPOSE: Although female and minoritized physicians are often recipients of prejudice and microaggressions, little is known about the implicit and explicit biases and attitudes held by medical doctors identifying with one or more marginalizing characteristics. Understanding the attitudes and perspectives at the intersection of multiple marginalizing identities is crucial for effective diversity training.

METHODS: We analyzed data from physicians completing the Implicit Association Test (IAT) between 2017 and 2020 through Project Implicit Bias (https://implicit.harvard.edu/implicit/) to investigate the differences in biases and attitudes by the number of marginalizing characteristics. Five publicly available datasets contained implicit and explicit bias measures examining attitudes towards race/ethnicity, skin tone, weight, disabilities, and transgender. We calculated a multiple marginalizing intersectionality score by summing affirmative responses to self-identifying as female, a minority race/ethnicity, or gender fluid/non-binary. We examined IAT responses by intersectionality levels (e.g., none, one, two or more) and associations between intersectionality, bias, and other attitudinal beliefs (e.g., political, poverty).

RESULTS: Responses from 33,055 physician participants ranged across the five studies: transgender ($n = 610$), disability ($n = 1632$), skin tone ($n = 4259$), weight ($n = 5327$), and race/ethnicity ($n = 21,225$). Overall, 29% reported as White males with no marginalizing characteristics, 50% reported one marginalizing characteristic, and 21% possessed two or more. Across all studies, physicians who self-described with several marginalizing characteristics held fewer biases against marginalized groups. In contrast, less-marginalized physicians held stronger biases for the dominant group (e.g., Whites, light skin, thin or abled persons, cisgender). Possessing several marginalizing characteristics was significantly associated with more liberal political views and greater preference for the study's target marginalized groups (e.g., Black, dark skin, disabled, transgender, overweight).

CONCLUSION: Physicians identifying as multiply marginalized have fewer biases against stigmatized groups than their less-marginalized counterparts, perhaps due to lived experiences as targets of overt discrimination or recipients of mundane humiliation and embarrassment in the clinical environment.

STUDENT-CENTERED PEDIATRIC RESPIRATORY SIMULATION FOR FIRST-YEAR MEDICAL STUDENTS

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PURPOSE: Peer teaching is commonly performed in medical schools and is known to be beneficial for both student educators and learners. The objective of this study was to enhance a previously student designed simulation, making it entirely student-centered to establish a comfortable learning environment and create an interesting, alternative method for studying. The student-centered focus also gave upperclassmen the chance to improve leadership skills and solidify basic science knowledge through roles as facilitators and standardized patients (SPs).

METHODS: The simulation involved caring for a neonate with respiratory distress syndrome (RDS). Each simulation session involved four to eight first-year medical students. Two student facilitators and one student SP were present in each session. Pre-test and post-test surveys designed as a 5-point Likert scale from the previous iteration of this simulation were used to determine perception of knowledge and communication skills. The post-test survey also included qualitative questions.

RESULTS: The post-test survey produced a statistically significant increase in perception of understanding (82.3%), communication skills (75.8%), and experience (96.8%) with RDS. There was no significant difference in results compared to the previous iteration of this simulation, which was not entirely student-run. Qualitative data described the simulation to be an informative, realistic scenario that emphasized teamwork and demonstrated how prior knowledge translates clinically. Students expressed appreciation for the upperclassmen's guidance and feedback upon completion. Unanimous interest in engaging in future student-run sessions was present amongst the participants.

CONCLUSION: Peer-led simulation is a useful design for medical schools wanting to incorporate student-centered experiences into their curriculum. The results suggest that the student-centered approach does not compromise the simulation's impact. A program such as this provides students with an opportunity to practice clinical and communication skills while interacting with upperclassmen. Furthermore, there is an additional educational benefit for upperclassmen in understanding the patient role and fostering leadership skills.

PROFESSIONAL IDENTITY FORMATION OF BASIC SCIENCE MEDICAL EDUCATORS: A QUALITATIVE STUDY

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PURPOSE: Basic science educators play a vital role in the education of medical students, yet little is known about what factors shape their professional identity. To shed light on this developmental process, we investigated the professional identity formation (PIF) of medical educators with doctoral degrees across numerous basic science disciplines.

METHODS: A multi-institutional qualitative descriptive study was conducted using a purposive sample of basic science medical educators in the USA. In-depth individual interviews and thematic analysis of interview data was used to identify facilitators and barriers to participants' PIF as medical educators.

RESULTS: Interviews were completed with 58 participants from 7 allopathic medical schools between December 2020 and February 2021. Participants described their own professional identity in a variety of ways, suggesting a lack of uniformity among this group. Participants reported a number of PIF supports, including teaching enjoyment, engagement with other medical educators, recognition and feeling valued, and institutional support. Some described themselves as "lucky" to be in the field of medical education. Threats to PIF included lack of educational and/or medical training (i.e., imposter syndrome), lack of established career and promotion pathways, and a perception that their educational work was less valued than their colleagues' scientific research. Participants also described additional challenges related to pursuing a unique and not widely understood career pathway, leading some to describe a sense of working in a "bubble" at their institution.

CONCLUSION: Our findings suggest ways that administrators and institutions can support the PIF of basic science medical educators by establishing clear career and promotion pathways for medical educators, creating robust communities of practice, and providing faculty development opportunities that strengthen medical educator PIF. The identity threats reported in our data demonstrate that much work remains to be done to support and develop medical educator identities among basic science faculty.

THE MOST INFLUENTIAL FACTOR TO PASS RATE OF MODIFIED OSCE EXAM ON MEDICAL STUDENTS DURING PANDEMIC PERIOD

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PURPOSE: There are many factors that influence to pass rate of modified OSCE. Moreover, during online learning implementation, there are some barriers. We have pursued

an enhancing theoretical concept regarding skill learning online. This study identifies the the most influential factor that contributes in achieving passing rate of modified OSCE online.

METHODS: An observational study was conducted with involving 230 medical students of Bandung Islamic University during 7 months. Sample size calculation used the formulation of estimated proportion population with simple random strategy. This study employed a questionnaire of online skill learning that was made by researcher through exploratory factor analysis. The participants were asked to score their agreement for 5-point Likert scale. Using SPSS version 24 and software of AMOS 26, we analysed the data for simple linear regression and structural equation modelling. Out of 8 domain of perception toward online learning process, we look for which most domain related to pass OSCE percentage. Using structural equation modelling, it was identified the most influential factor to student readiness in facing the OSCE online. The domain was deemed significant influence, if it has a critical rate of more than 1.96, and was identified as most influential factor if it has the highest value (p-value < 0.05).

RESULTS: Our work found that three factors of perception affects student's readiness facing the OSCE online, namely students access to resources, self-reflection, and experiential learning. Our finding highlights that learning platform availability has significant contribution toward pass rate OSCE (p-value $= 0.008$; CR $= 2.65$).

CONCLUSION: The study has contributed to overcome some barrier regarding foundational concept for requirement of online learning. The theoretical concept of learning platform availability also strengthen online learning. A major strength of this study is the systematic manner in which it was conducted.

KEYWORDS: Important domain, Modified OSCE, Passing rate, Online learning, Pandemic COVID

NEW EDUCATORS AND SCHOLARS TRAINING (NEST) PROGRAM
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PURPOSE: Medical students and residents worldwide thinking about an academic career are interested in learning the science behind medical education (MedEd), but do not have many free or low-cost options. We developed a program to educate future medical educators about the best practices in MedEd, involving monthly Zoom seminars and a capstone assignment.

METHODS:Originally developed 5 years ago to support development of student educator scholars at ScholarRx, the program expanded to include student scholars at no cost from IAMSE and 10 international medical student organizations: the Medical Student Alliance for Global Education. Scholars study a total of twelve online learning modules prior to monthly Zoom meetings with a MedEd domain expert. Topics include learning and teaching principles, in the classroom, clinical environment, virtual environment, learning and assessment, curriculum design, student involvement, quality assurance, and research in MedEd. As a capstone project, scholars design and develop a brick module after performing a needs assessment, establishing goals, learning outcomes, outline, and 2 drafts. Students ranked statements of program usefulness on a Likert scale.

RESULTS: One hundred one prospective participants have enrolled and 23 have completed the program with most participants still participating. Most scholars are based outside of the USA and all have expressed a desire to teach in medicine. Participants gained a greater understanding of engagement as a medical student, were able to switch from passive to active assimilation of knowledge, and felt the NEST program was a great resource for learning the principles of MedEd and felt they were able to effectively train students and future patients, graded on a likert scale.

CONCLUSION: In-depth international medical student education on medical education can create a nidus of sophisticated and competent future medical educators. The creation of a learning community is of vital importance.

STUDENT-LED CURRICULAR DEVELOPMENT IN THE BIOMEDICAL SCIENCE MASTER'S PROGRAM USING VIRTUAL DISSECTION
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PURPOSE: Cadaveric dissection is an important tool within graduate medical education (GME), but not always possible to implement. When cadaveric dissection cannot be conducted, virtual dissection may be used to supplement anatomical education. We developed student-designed curricular activities to incorporate the Anatomage Table into GME. The goal of this project is to determine whether integration of this tool improves student learning outcomes in Marian University's Biomedical Science Master's (BMS) program.

METHODS: Our method is notable and novel; former BMS Master's students created activities which were designed to align with lecture content and used for the pilot study presented here. These students-turned-teachers offered unique perspectives and approaches to material. Participation in this study was voluntary. Participants ($n = 24$) and non-participants ($n = 29$) were both exposed to the Anatomage

Table during formal anatomy lectures; however, participants received additional, directed time with the table. Unpaired *t*-tests were used to compare exam performances between groups, and surveys were distributed intermittently to measure changes in students' perceptions of virtual dissection technology and its use in supplementing traditional anatomy education.

RESULTS: Students who participated in the Anatomage Table activities consistently scored higher, on average, on all exams, exam question categories supplemented by Anatomage activities, and within the course. Notably, significantly higher scores ($p < 0.05$) among participants were observed for several exam question categories related to the activities. Additionally, qualitative data from surveys before and after students' experience with the Anatomage Table shows an increase in confidence, comfort, and motivation for learning using virtual technology.

CONCLUSIONS: This research aimed to determine whether implementation of a virtual dissection tool improved student learning and exam scores. Ongoing quantitative and qualitative analyses suggest that use of the Anatomage Table, paired with former student-created activities, can benefit student learning and consequent course performance.

PRECLINICAL ULTRASOUND EDUCATION USING A NEAR-PEER EDUCATIONAL MODEL

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PURPOSE: Ultrasound (US) is an increasingly relevant diagnostic tool in many medical specialties that shows great promise as a tool for undergraduate medical education. Using a constructivist and behaviorist theoretical approach, we designed a near-peer teaching (NPT) framework to introduce a five-session ultrasound elective for first-year (M1) medical students with sessions taught by second-year (M2) and fourth-year (M4) medical students and supervised by radiology, emergency medicine, and anatomy faculty.

METHODS: The elective ran for its inaugural session in Fall 2021. Five 1-h sessions covering topics related to the concurrent M1 anatomy course were held for 20–30 participants per session. Small groups of 3–6 participants were taught by an M4 student at one of six US machines; faculty would rotate between stations to teach and answer questions. Four M2 students coordinated the course and drafted session guides and learning objectives, which were reviewed by M4 students and faculty. Before each session, participants were given the session materials and pre-work assignments. After the course's CONCLUSION, participants completed a post-survey containing both open-ended free-response questions and self-assessment Likert-style questions assessing their knowledge of and interest in ultrasound.

RESULTS: During the first year of the elective, 92 first-year students participated in at least one session, and, as of this writing, 21 participants have completed the post-survey. Thus far, the majority of student responses show increased knowledge of US skills and indicate a desire to participate in a similar US elective in the future. Students also identified areas for growth, including wishing they had more exposure to how clinical faculty use US in practice.

CONCLUSION: Through the introduction of a preclinical US elective taught through an NPT framework, we were able to measure student learning of US and related anatomy concepts and strengthen students' motivation to continue to learn about US in the future.

USING SCRIPT-CONCORDANCE TESTING IN OSCES: A PILOT TO ENCOURAGE INTEGRATION OF FOUNDATIONAL KNOWLEDGE INTO CLINICAL THINKING

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PURPOSE: Objective Structured Clinical Exams (OSCEs) often include post-encounter evaluative exercises such as student documentation of the standardized-patient (SP) visit in "note" format. We piloted the use of Script Concordance Testing (SCT) in OSCEs to highlight the application of foundational science to clinical experiences, incorporating conditions of diagnostic uncertainty and interpretation.

METHODS: During our 8-week transition-to-clerkship course, students experience a formative OSCE. We replaced one post-encounter note write-up with SCT. Questions presented students with potential differences or changes in the patient's situation, symptoms or history. Students determined how that change impacted the likelihood (more, less, or no impact) of potential diagnoses, recommended testing or treatment. Students individually debriefed their experiences with the SPs and with the OSCE team during an optional review session.

RESULTS: One hundred ninety-two students completed the OSCE with SCT and 174 (90%) attended the review session. Students expressed surprise at how small changes in a patient's story could have significant impact on diagnosis and care. They commented on the value of SCT thinking in compelling application of foundational knowledge to their clinical reasoning and for their preparation for clinical rotations.

CONCLUSION: Our pilot experience supports use of SCT to help students apply foundational science knowledge to

clinical situations. It provides students the opportunity to experience the real life adjustments to interpretation/reasoning when further data becomes available or as conditions progress. Our next steps include incorporation of SCT into our capstone OSCE for senior students and comparison of post-encounter SCT vs note write-ups in their impact on student application of scientific knowledge to clinical scenarios.

EXAM PERFORMANCE COMPARISON ACROSS CURRICULAR DELIVERY MODELS PRIOR TO AND DURING COVID-19

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PURPOSE: The COVID-19 pandemic necessitated modification of medical school curricular delivery from in-person to remote learning in 2020. In the fall of 2021, a hybrid curricular model utilizing remote and live delivery was established. We compared exam data between pre-pandemic in-person delivery, pandemic-era remote delivery, and the recently enacted hybrid model to test the impact of the changes in delivery method on exam performance.
METHODS: Test performance statistics were analyzed for student cohorts receiving in-person, remote, or hybrid curriculum in first-year Musculoskeletal (MSK) courses and second-year Gastrointestinal-II (GI-II) courses. MSK was delivered in-person for the class of 2023 (COM-2023), remotely for COM-2024, and through hybrid delivery for COM-2025, whereas GI-II was delivered in-person for COM-2022, remotely for COM-2023, and via hybrid model for COM-2024. Psychometric data for exam items reutilized across the three study years were compared using ANOVA statistical analyses. Baseline class performances were established utilizing pre-admission MCAT scores, and undergraduate overall/science GPAs.
RESULTS: Baseline performance on MCAT scores showed no significant difference between COM-2022, -2023, -2024, and -2025, or in overall/science GPA between COM-2022, -2023, and -2024; COM-2025 showed a statistically higher overall/science GPA as compared with the other groups. The second-year GI-II courses showed no significant difference in overall mean but statistically significant ($p < 0.05$) decreases in lower quartile student performance in the remote and hybrid delivery models as compared to live delivery. The first-year MSK course showed no significant differences in performance statistics through all three delivery models.
CONCLUSION: A second-year medical school course showed depressed performance in the lowest-performing quartile in remote and hybrid curricular delivery models as compared to pre-pandemic live curriculum. Performance in a first-year course was not statistically significant between the three studied curricular models.

CONSTRUCTED RESPONSE SHORT ANSWER QUESTIONS ON MEDICAL STUDENT EXAMS: ARE THEY FEASIBLE AND RELIABLE?

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PURPOSE: Constructed response short-answer questions (CR-SAQs) on summative exams carry benefits for medical students and educators. However, the perceived burden associated with CR-SAQs may impede their use in medical education. The objective of this study was to examine the feasibility of utilizing CR-SAQs from the perspectives of faculty and students across three institutions and to establish the inter-rater reliability of scoring CR-SAQs.
METHODS: Question writers ($N = 5$) from three US medical schools met virtually to create a set of CR-SAQs to be used at each school on a summative exam in the first year of medical school. After the exams were administered, the study questions were scored by faculty content experts ($N = 7$), faculty non-content experts ($N = 6$), and fourth-year medical students ($N = 7$). Cohen's weighted kappa (kw) was used to evaluate inter-rater reliability between the content expert and other scorers. Structured interviews were performed with question writers and an open-ended question survey was administered to scorers. Content analysis was performed on the qualitative data.
RESULTS: Inter-rater reliability between the content expert and student scorers was fair/moderate (kw = 0.34–0.53 holistic rubrics) or substantial (kw = 0.67–0.76 analytic rubric), but lower between content and non-content experts (kw = 0.18–0.29 holistic rubrics; kw = 0.59–0.66 analytic rubric). All question writers participated in the interviews and twelve faculty and student scorers ($N = 12/20$, 60%) completed the survey. Working with a team, getting feedback from others, and carefully wording the question were recommended for writing CR-SAQs. For scoring CR-SAQs, reading a sample of responses first, adjusting the rubric, creating notes, and setting aside sufficient time were recommended.
CONCLUSIONS: CR-SAQs can be reliably scored using an analytic rubric by faculty or senior medical students who do not have content expertise, which may relieve the faculty burden associated with grading CR-SAQs. Our findings also show that it is feasible to include CR-SAQs in summative exams.

CAN ARTIFICIAL INTELLIGENCE ADDRESS THE BURDEN ASSOCIATED WITH SCORING NARRATIVE ASSESSMENTS?

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PURPOSE: A long-standing problem for educators has been determining how to create meaningful assessments that can be efficiently and reliably scored within a reasonable time frame. Medical educators must assess students' clinical skills and reasoning which, if done right, requires time and labor-intensive performance-based assessments, such as Objective Standardized Clinical Examination (OSCE). OSCEs are composed of multiple encounters with standardized patients. After each encounter, students complete a post-encounter note (PEN). Scoring PENs is time and labor-intensive. This project developed and tested an artificial intelligence model to automatically score OSCE PENs.
METHODS: The AI model was developed in two steps: (1) we used medical textbooks to pretrain the model to understand the specialized key medical terms needed to score OSCE PENs; (2) the pretrained model was then fine-tuned using an 80–20 testing experiment wherein PENs from previously graded, five station OSCEs was split, with 80% for additional model training ($n = 3335$) and 20% for model testing ($n = 660$).
RESULTS: According to the results on the testing dataset ($n = 660$), the current model grades students' examinations with a 6.23% error (i.e., 0.24 mean squared error). Moreover, the results show that the model outperforms state-of-art models that are pretrained on clinical notes.
CONCLUSION: The performance of the current AI model suggests a computer can be trained to score PENs and can provide a solution for labor-intensive OSCE grading. The next step is to continue training the current AI model using all required medical textbooks at this medical school ($n = 310$). We also plan to pilot the further refined model in action with ungraded and graded PENs in future examinations. With increased exposure to examination data and medical terminology, we hypothesize that the accuracy of scoring should increase by a larger margin.

EFFECT OF DISSECTION-BASED LAB VERSUS VIRTUAL ANATOMY LAB ON STUDENT LEARNING IN A NEUROSCIENCE COURSE

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PURPOSE: With the onset of the COVID-19 pandemic, safety measures such as social distancing were implemented to protect against transmission of the virus. Student cadaveric dissection as part of a medical gross anatomy curriculum was one of the previous in-person experiences that Rocky Vista University moved to a virtual lab format in response. The purpose of this study is to examine the effect of a virtual versus in-person format on student performance on anatomy of the Neurosensory system.
METHODS: Here we compared student performance in the Neurosensory system, which covers the anatomy of the head, neck, and central nervous system, when students experience in-person dissections versus a completely online format. For the online group, live streamed prosection demonstrations over the Zoom platform allowed students to view relevant anatomy, ask for additional views, and have questions answered. Anatomy lab evaluations were also virtual through the ExamSoft platform consisting of static pictures of dissected cadavers. We compared the completely online students to students who experienced hands-on, student-led dissection based learning of the same cadaveric structures. All assessments were kept as similar as possible to allow direct comparison between groups. Student's *t*-tests were employed to assess differences in mean performance between groups.
RESULTS: We saw a significant decrease in student performance on anatomy practical exams after learning via the virtual format, even after assessment changes to match were made.
CONCLUSIONS: These results support previous research demonstrating the value of cadaveric dissection or prosection style gross anatomy labs. While a virtual lab was acceptable during a public health emergency, it is not sufficient for proper education in the structure and function of the human body.

A NOVEL FRAMEWORK FOR TEACHING SKILLS TRAINING DURING THE PRECLERKSHIP PHASE OF MEDICAL SCHOOL

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PURPOSE: The ability to teach colleagues and patients is an important skill for medical professionals to acquire. However, teaching skills training is often not a required element of undergraduate medical curricula, especially in the preclinical years (1–5). Our team developed a teaching skills framework and assessed the impact on teaching skills development during the Preclerkship phase of the curriculum.

METHODS: First year medical students were introduced to the teaching skills framework during orientation through video lessons on the following five competencies: learning objectives, lesson complexity, audience engagement, relevance to practice, and resource selection. Students practiced these competencies weekly through the creation and presentation of learning issues for problem-based learning (PBL) tutorial sessions. The first 4 weeks following orientation, PBL facilitators used a rubric created to assess the level of performance for each competency and provide immediate feedback to each student. Students earned a score of 0–2 for each of the five competencies. Thereafter, use of the rubric was optional. The same rubric was then used at weeks 8 and 12 to assess continued presence of competency performance.

RESULTS: Over the first 4 weeks, mean scores rose for the following competencies: learning objectives—1.07 to 1.98; complexity—1.53 to 1.92; engagement—1.39 to 1.7; relevance—1.53 to 1.79; and resources—1.74 to 1.92. At week 8, mean score ranged from 1.68 to 1.8. And at week 12, mean scores raged from 1.66 to 1.91.

CONCLUSION: These score increases over the first 4 weeks demonstrate an increase in student implementation of the teaching strategies taught through purposeful practice and targeted feedback. The persistent score ranges at weeks 8 and 12 demonstrate continued presence over time. Additional measures would be needed to assess if these skills carry over to clerkship phase teaching tasks and beyond.

COMPARING A NON-ADAPTIVE TO AN ADAPTIVE E-LEARNING INTERVENTION ON MEDICAL STUDENT NEUROANATOMY SELF-EFFICACY AND NEUROPHOBIA WITHIN AN INTEGRATED FIRST-YEAR MEDICAL CURRICULUM

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PURPOSE: Curriculum integration, requiring the addition of clinical information and loss of lecture time, has decreased preclinical neuroanatomy instructional hours. Concurrently, anxiety towards learning neuroanatomy, neurophobia, may be negatively influencing medical student success in neuroanatomy. This study addresses the combined challenge of decreasing instructional hours and increasing medical student neurophobia by administering an adaptive eLearning neuroanatomy instructional tool for use within time-constrained integrated curricula. Literature suggests adaptive eLearning may decrease instructional time while improving accuracy and performance. We hypothesize an adaptive eLearning intervention will decrease neuroanxiety and increase neuroanatomy self-efficacy more than a self-directed (non-adaptive) eLearning intervention.

METHODS: This causal comparative study administered a non-adaptive intervention in 2018 ($n = 160$) and an adaptive intervention in 2019 ($n = 162$) to first-year medical students. Instruments to measure neuroanatomy self-efficacy (NSE) and neurophobia (NA) were administered before and after module utilization to obtain pre-test and post-test NSE and NA scores. Analyses of covariance determined differences in pre-test and post-test NSE and NA scores, while controlling for pre-test score differences, between the non-adaptive and adaptive groups. All statistical tests were performed at $p = 0.05$. IRB approval was obtained.

RESULTS: Data analysis showed the adaptive intervention increased post-test neuroanatomy self-efficacy scores ($F(1,75) = 6.2$, $p = 0.01$). While both interventions slightly reduced neurophobia levels, the adaptive module did not significantly reduce post-test neurophobia scores compared to the non-adaptive intervention ($F(1, 45) = 2.16$, $p = 0.15$).

CONCLUSION: Adaptive eLearning may be an efficient way to administer neuroanatomy material within an integrated curriculum. An adaptive neuroanatomy eLearning intervention increased first-year medical student neuroanatomy self-efficacy. The adaptive module slightly decreased neurophobia, albeit not significantly. Given the moderating effect of self-efficacy on academic anxiety shown in the literature, perhaps the intervention's benefit to neurophobia is indirect. This novel study supports future investigation into targeting neuroanatomy self-efficacy to moderate neurophobia.

A NEW TEACHING ELECTIVE FOR MEDICAL STUDENTS AT KIRK KERKORIAN SCHOOL OF MEDICINE

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PURPOSE: While opportunities exist at our program for medical students to participate in peer-peer/near-peer teaching, no formal teaching curriculum exists. The recognition of this need, combined with the constraints of the pandemic necessitating nonclinical and remote elective options, propelled the creation of a problem-based Learning (PBL) teaching elective.

METHODS: Mirrored after PBL faculty development and training sessions, we developed a classroom-based PBL teaching elective for 4th year medical students. The major curricular components consist of didactic sessions based on selected readings that support anticipated skills performance, direct teaching opportunities both on-campus and remotely, weekly reflection assignments, and completion of either a quality improvement or case writing project. Elective students also receive feedback on their performance as a junior faculty guide during PBL tutorial sessions from their student group.

RESULTS: The elective received a score of 5 (using a 5-point Likert scale) for all measure items in the Evaluation of Nonclinical Elective by Student form, completed by all participating students. Written comments included the following: allowed me to explore my interest in teaching; this course did an incredible job of introducing me to the fundamentals of academic medicine; I feel much more prepared to be a resident, who is expected to be in a teaching role for medical students, peers, and patients; great variety of experiences and assignments even for a short rotation.

CONCLUSION: Formal teacher training programs starting in UME can help medical students develop their teaching skill set early. The elective was developed at an opportune time and allowed students to experience teaching environments on-campus and remotely. While the elective was well received by the participating medical students, opportunities for improvement are underway to include the impact on the learning of the student groups facilitated by the elective students.

ESTABLISHING A VIRTUAL REALITY TEMPORAL BONE DRILLING SIMULATION LABORATORY: IS IT USEFUL?

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PURPOSE: To assess and compare the confidence, objectives and experience of junior ENT doctors before and after mastoid surgery training using the VOXEL-MAN Virtual Reality (VR) Temporal Bone (TB) Simulator.

METHODS: Candidates attended a 3-h course at the West-Midlands VR TB Laboratory (Lab) between June and September 2021, and completed pre- and post-course questionnaires asking about general demographics, sub-speciality interests, previous TB course and mastoid surgery experience, as well as learning objectives (LOs) for the course (list of 16 options). Additionally, confidence with key steps of TB surgery was self-rated by participants prior to and following the course.

RESULTS: Twenty-five (17 M:8 F) junior doctors attended mastoid surgery training courses in the VR TB Lab, of which 96% (24/25) completed pre- and post-course questionnaires. Candidates included foundation trainee year 3 to specialist trainee (ST) year 6, and included four non-training grade doctors. Eleven were classed 'junior candidates' (JCs; ST3s and below), and 14 'senior candidates' (SCs; ST4 and above). Two had previous VR TB experience, and 18/24 (75%) had TB wet lab experience. One JC (9%) had performed a cortical mastoidectomy versus 100% of the SCs. All (100%) JCs wished to make a start on learning TB anatomy and how to drill a TB. These LOs were successfully achieved by all (100%) JCs. SCs had more diverse objectives with focus on more specific skill development. Those chosen to focus on during the 3-h course were met. Improvement in confidence was made in all six domains assessed. An appropriate level of supervision was reported by 22/24 (92%) and 23/24 (96%) rated the course as 'extremely useful'. All (100%) felt they would benefit from attending again and would recommend it to others.

CONCLUSION: This suggests that junior doctors of varying previous experience can benefit from VR TB Lab Courses.

HOW DID WE GET HERE? BASIC SCIENCE FACULTY PATHWAYS TO MEDICAL SCIENCE EDUCATION

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PURPOSE: Basic science educators play a vital role in the education of medical students, yet little is known about their pathways into this role. To support future medical science educators, there is a need to first identify the career pathways and the factors that support and hinder basic science faculty who become medical educators.

METHODS: A multi-institutional qualitative descriptive study was conducted using a purposive sample of basic science medical educators with PhD degrees in biomedical science disciplines in the USA. In-depth individual interviews and thematic analysis of interview data were used to identify participants' pathways into medical education and the key factors influencing those pathways.

RESULTS: Fifty-eight participants from 7 allopathic medical schools participated in interviews between December 2020 and February 2021. Except for anatomy educators, whose training often included teaching medical students, most participants did not consider medical education as a serious career pathway during their PhD training and often described their pathways into medical education as serendipitous. Most participants described their training or preparation for teaching as "on-the-job," citing a paucity of graduate or postdoctoral-level training programs specific for careers in education. Participants also reported that mentors played a key role in facilitating their pathways into medical education. Many respondents reported an attraction to teaching, rather than a dissatisfaction with bench research, as a main motivation to become a medical educator.

CONCLUSION: This study highlights the confluence of serendipity, "on-the-job" training, and mentoring as the most

common facilitators for basic scientists' entry into career pathways in medical science education. Our findings highlight a need for sustaining mentoring programs, particularly in faculty who are new to medical science education and suggest an opportunity for growth of formal pre- and post-doctoral educational training programs.

EFFECTIVENESS OF PROBLEM-BASED LEARNING IN UNDERGRADUATE MEDICAL EDUCATION: A SYSTEMATIC REVIEW

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PURPOSE: Problem-based learning (PBL) has been in use in medical education for over 50 years, and there is a need to evaluate how learning and skill development improve with PBL. The purpose of this systematic review is to summarize the available evidence on whether PBL is more effective in helping students enhance cognitive integration and/or improve life-long learning skills, compared to lectures or traditional learning. Secondarily, does PBL promote active self-directed learning skills?.

METHODS: Studies were included if undergraduate medical students were taught using a PBL approach and if their performance was compared to lecture-based learning. Outcome measures included performance on national or local examinations or assessment by questionnaire or survey. Observation, quasi-experimental, and experimental studies published in English from 2007 to 2020 were included. PubMed, Embase, ERIC, CINAHL Plus, and PsychInfo were queried on December 31, 2020. The risk of bias was assessed for each included study. results were qualitatively assessed.

RESULTS: From the literature search, 205 articles were screened and subjected to inclusion/exclusion criteria in the first-pass review, resulting in a total of 34 articles. After the second-pass review, a total of 8 articles which studied 3103 subjects were used for data extraction. The observational designs of the studies led to low quality assessment scores (highest score being 8 on a scale of 12). Overall, students prefer PBL, and PBL-taught students have exam scores that are equal to or better than those from lecture-based classes. There is a strong likelihood that publication bias may have affected the patterns revealed in this study.

CONCLUSIONS: Of the studies examined, the evidence that PBL improves learning over traditional teaching modalities in undergraduate medical students is equivocal. Since PBL is learner-centered and promotes a social, collaborative, transdisciplinary approach to cognitive integration, it will likely continue to be implemented in medical education widely.

MEDICAL AND ALLIED HEALTH STUDENTS PERSPECTIVES OF PREPAREDNESS TO TREAT DIVERSE POPULATIONS

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PURPOSE: The COVID-19 pandemic has underscored the lack of equity in healthcare quality for diverse groups. The undoing of institutionalized racism in healthcare requires early training of medical providers. This study examines the cultural competency of preclinical and clinical students enrolled in health professional programs to identify areas for improvement and make suggestions addressing them.

METHODS: The Clinical Cultural Competency Questionnaire, a validated tool to assess student knowledge and attitudes related to cultural competency, was administered to health professional students within nursing, physical therapy, occupational therapy, physician assistant (PA), and osteopathic medicine (DO) programs at Touro University Nevada. Differences between preclinical and clinical groups, and among academic programs were inferred using Fisher's exact tests, analysis of variance, or Kruskal–Wallis tests.

RESULTS: The majority of participants (preclinical $n=91$, clinical $n=52$) were female, under 30-year-old, non-Hispanic, White, or Asian, and enrolled in a DO (38%) or PA program (36%). Preliminary analysis showed preclinical students reporting statistically significant knowledge on demographics of diverse racial groups ($P=0.044$). Although clinical students reported knowledge of the historical and contemporary impact of racism, bias, prejudice, and discrimination against diverse populations in healthcare in the USA in a statistically significant manner ($P=0.013$), they were not consistent in reporting having received specific diversity training. The most highly ranked topics to be pursued in an elective course were racial group-specific: health risks (median rank $=2$, IQR $=1$, 3), health disparities (median rank $=3$, IQR $=2$, 4), and ethnopharmacology (median rank $=4$, IQR $=3$, 6).

CONCLUSION: Students communicated their knowledge of racism, bias, prejudice, and discrimination in healthcare. However, since the knowledge is not training-based, it is not implemented into practice. The need for a standardized elective course on cultural diversity, sensitivity, and inclusion is paramount to address the gaps in knowledge identified above.

EVALUATING INTERPROFESSIONAL EDUCATION TRAINING PROGRAM FOR ORAL HEALTH CHAMPIONS IN SIX STATES

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The National Center for Integration of Primary Care and Oral Health (CIPCOH) is committed to evolving the oral health curriculum in every health profession school/program in the USA (medical, osteopathic, physician assistant, nurse practitioner, midwifery, obstetrical, internal medicine, family medicine, pediatrics, med-peds, geriatrics). We developed, offered, and evaluated a pilot of our 100 Million Mouths (100MM) Project because we feel that if we can create an Oral Health Education Champion in every state, then we can support that Champion in reaching out to health profession schools/programs in their state and engaging them to improve their oral health teaching. As those students and residents graduate and care for patients, they will improve the oral health of millions of patients.

METHODS: In 2021, six oral health champions were selected by the CIPCOH representing states assessed with greatest needs and potential benefits for preparing champions of Primary Care Education Enhancement of Oral Health Integration in educational training and collaborative practice. These states included Alabama, Delaware, Hawaii, Iowa, Missouri, and Tennessee. An Evaluation Framework designed according to systems change theories guided formative and summative evaluation activities. Input, process, output, and outcome performance indicators were identified related to the pre-training, intra-training, and post-training phases of training.

RESULTS: Trainees were very appreciative of the opportunity to be selected as their State representative OH Champion. Trainees generally appreciated the data-driven identification of their states as target for recruitment; the process of notification of selection and induction into the training program; and that their anticipated expectations and aspirations would be considered and met. Program participation and retention were exceptional.

CONCLUSION: Trainees would overwhelming recommend this program to future state OH Champions. Overall, trainees would recommend that OH Champion Collaborative Teams for each state be considered in the future to strengthen interprofessional integration and state-wide reach.

A PRACTICAL AND EFFICIENT FACULTY REVIEW PROCESS FOR IMPROVING MULTIPLE CHOICE QUESTION METRICS

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PURPOSE: Despite their curricular importance, a large proportion of multiple-choice questions (MCQs) are flawed and/or fail to assess the intended knowledge domain or competency. Although faculty peer or committee review has been demonstrated to improve the quality of MCQ exams, such review processes are typically resource-intensive and time-consuming. We report here a practical and efficient peer review process that consistently improves MCQ exam quality.

METHODS: A small peer review committee was formed to review the final exams of six independent block courses taken by first- and second-year students at the University of Illinois College of Medicine. The committee consisted of four to five faculty with experience in item writing. Based on post-exam item metrics, MCQs that had both a discrimination index < 0.2 and difficulty level < 0.91 were selected for review. For every exam, the reviewers independently evaluated each item over a 2-week period and provided evaluative comments through a common secured document. The committee convened a single virtual meeting to arrive at a consensus on item flaws while providing suggestions for improvement. The final comments were shared with the block directors who then communicated the changes and corrections with the original item authors.

RESULTS: Based on the above metrics, 15–20% of MCQs per block exam were peer reviewed. Each reviewer took approximately 10 min to review each question and committee meetings were about 90 min in length. Upon exam re-administration, this process resulted in a significant increase ($p < 0.05$) in the item discrimination of reviewed questions in all six block exams.

CONCLUSION: Our results support the utility of a peer review process in MCQ exam quality and may offer medical educators a more practical and efficient process, requiring limited faculty time and administrative resources, for improving the quality of in-house MCQ exams.

BIOMEDICAL SCIENCES AND ETHICS AND HUMANITIES, BUILDING CONNECTION FOR DEEPER LEARNING IN UNDERGRADUATE MEDICAL CURRICULUM

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PURPOSE: Medical ethics education is crucial to cultivate medical student professionalism, and to prepare them to face ethical situations that arise in clinical practice. Medical schools continue to develop new ways of incorporating medical ethics into their curriculum. However, instances

of ethics being integrated into biomedical sciences course, and utilizing pathophysiological processes to further student understanding is limited. We developed a novel ethics learning thread that is embedded in a biomedical science course. METHODS: Three ethics learning modules were designed and built into a 6-week immune system course. Each module integrated ethics and humanity learning with immunology topic. The first module used a documentary about a well-known patient with severe combined immunodeficiency disease. The second module was delivered through a team-based learning case on HIV. The third module used small-group discussion and debate on blood transfusion. Reflective writing was embedded in each module to assess student knowledge and attitude. Quantitative and qualitative analyses were conducted on survey responses to assess student perceptions.

RESULTS: Likert scale rating (1–5, with 5 being most useful) of training modules revealed a significantly higher rating for debate module (4.7 average), seconded by the documentary module (4.4) and then the TBL module (4.0). Common and unique codes from survey were identified to suggest the strength and weakness of each module. Codes include the modules promoted critical thinking and raised awareness of ethical complexities. Overall, students' perception of the curriculum design was extremely positive.

CONCLUSION: This curricular model highlights the benefits of integrating medical ethics into biomedical science courses during preclinical undergraduate medical education and provides insight on a novel approach that can be tailored to any institution. We believe that this curriculum can improve patient care by helping physicians in training to recognize, analyze, and resolve ethical dilemmas early in their careers while learning foundational bioscience.

DESIGN THINKING METHODS IDENTIFY UNIQUE THEMES AND PATTERNS IN MEDICAL STUDENT EXPERIENCES

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Virginia Tech | Virginia Tech | Virginia Tech | Virginia Tech

PURPOSE: Medical education programs use a variety of mechanisms to evaluate effectiveness, but they may not give a complete account of the student experience. To improve our understanding of medical student experiences, we implemented design thinking methods to collect longitudinal student feedback to guide program improvement.

METHODS: A random sample of first through fourth year students at Virginia Tech Carilion SOM were interviewed to address medical school experiences and perceptions of learning. Following the interview, individual experience diagrams were thematically coded and sorted using a rose-thorn-bud approach and affinity clustering. Coded information was organized across the 4-year curricular timeline and used to inform development of student personas. Generation of student personas utilized a composite of personal information, student quotes, and common experience themes. Themes gathered by the design thinking process were compared to those gathered by traditional programmatic evaluations.

RESULTS: Consistent themes across both data sets (affinity clustering vs. traditional programmatic evaluations) were those surrounding student experiences in problem-based learning and longitudinal clinical experiences. Themes unique to the design thinking process involved personal routine (e.g., wellness activities), learning behaviors (e.g., use of 3rd party resources), backgrounds (lack of diversity), student support (e.g., need for mental health resources), and cohesiveness (e.g., "not competitive"). Differences in experiences and themes led to the generation of distinct persona designs for preclinical and clinical students and a student experience diagram. Personas and experience diagram serve as visual communications for students, faculty, and administration to respond to.

CONCLUSIONS: Coupling of research interviews with design thinking methods has identified several non-curricular themes experienced by students that could better inform curricular change, resource allocation, and faculty development. The unified experience diagram provides a cohesive visual for students to continue to respond to and provide feedback that has the potential to effect meaningful curricular and programmatic change.

USABILITY DOES NOT GUARANTEE USE: HOW TIMING INFLUENCES STUDENT ADOPTION OF A HISTOLOGY LEARNING APP

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PURPOSE: Mobile applications (apps) are increasingly used to supplement medical education. However, as more apps are introduced to supplement teaching, it is unclear how students incorporate these technologies into their learning. We sought to clarify how the timing of app introduction during a histology course influences its adoption and use.

METHODS: We developed an app for gastrointestinal histology that was used in the final course of the first-year medical curriculum. The app contained a learning mode (explore) to supplement histology labs and a testing mode (gaming) with randomized multiple choice questions. To address the impact of timing, half the students gained app access the first three weeks of class (group A) while the other group gained
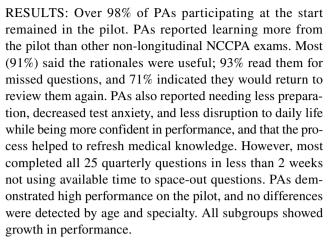
access three weeks prior to the exam (group B). We examined students' use of the app via logins, time of use, and mode usage. We also conducted student interviews and an anonymous survey to ascertain how students used the app.
RESULTS: Sixty-three of 301 first-year students installed the app and 50 filled out the survey. Explore mode was used equally between groups. Group B showed a trend for higher use of the gaming mode, but it was not statistically significant. Forty-four of 50 surveyed students rated the app 3 or more stars out of 5. Twenty-six of 50 students used the app once a week or more. Student interviews suggested students are less inclined to incorporate new technology tools in later stages of their first year.
DISCUSSION: Though feedback on the histology app was positive, the adoption rate among students was low. Both groups used the explore mode to a similar degree, but group B showed increased use of the game mode to prepare for the examination. Students suggest introducing new tech tools early in curriculum before study plan structure solidifies and demonstrating the tool in class to increase use.

AN INNOVATIVE PILOT PROGRAM FOR PHYSICIAN ASSISTANT ASSESSMENT OF CORE MEDICAL KNOWLEDGE AND CONTINUOUS LEARNING

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PURPOSE: The National Commission on Certification of Physician Assistants (NCCPA) certifies that physician assistants (PAs) meet clinical knowledge and reasoning standards. Utilizing adult learning theory, NCCPA developed an innovative longitudinal pilot program to assess core medical knowledge while fostering continuous learning and retention. We describe PA perspectives regarding the pilot and its impact on ongoing learning.
METHODS: The web-based pilot program was implemented from 01/2019 to 12/2020 with over 18,000 PAs. We evaluated performance and surveyed participants quarterly, assessing their experiences. Key pilot components included spaced testing (25 quarterly questions), individualized feedback, and resources based on performance. PAs were asked about confidence level and question relevance to their practice enabling identification of content-area knowledge gaps and learning opportunities by relevance to practice. PAs immediately knew whether each answer was correct/incorrect, could view their overall percent correct, and compare performance to others. After each question, PAs were given rationales/references and had access to all feedback/resources for 2 years to enhance learning.

RESULTS: Over 98% of PAs participating at the start remained in the pilot. PAs reported learning more from the pilot than other non-longitudinal NCCPA exams. Most (91%) said the rationales were useful; 93% read them for missed questions, and 71% indicated they would return to review them again. PAs also reported needing less preparation, decreased test anxiety, and less disruption to daily life while being more confident in performance, and that the process helped to refresh medical knowledge. However, most completed all 25 quarterly questions in less than 2 weeks not using available time to space-out questions. PAs demonstrated high performance on the pilot, and no differences were detected by age and specialty. All subgroups showed growth in performance.
CONCLUSIONS: PAs view the pilot as fostering continuous learning. More research is needed on why PAs do not space questions throughout the entire allotted period.

MORE THAN A CHECK BOX: AN OVERVIEW OF DIVERSITY, EQUITY, AND INCLUSION EFFORTS IN PHYSICIAN ASSISTANT (PA) EDUCATION

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Physician Assistant Education Association | Physician Assistant Education Association | Physician Assistant Education Association

PURPOSE: To equitably ensure the competence and success of all PA applicants, students, and graduates, physical assistant programs are poised to make changes in support of their students and faculty, especially those from underrepresented minority (URM) backgrounds. The Physician Assistant Education Association (PAEA) developed the Diversity, Equity, and Inclusion (DEI) Toolkit and Best Practices to assist PA programs in examining their practices, climate, and cultures. Programs were surveyed to gain an understanding of the current state of DEI efforts in PA education.
METHODS: In August 2021, program directors at all 277 PAEA member programs were surveyed on their DEI practices, including usage of the DEI toolkit, DEI efforts (e.g., the development, implementation, and support of goals), and engagement in best practices. In addition, programs also surveyed about whether strategies were in place to understand retention issues in instances where URM students, faculty, and staff were not retained. Further, we investigated if there were differences in public and private PA programs' DEI engagement.
RESULTS: One hundred sixty-two programs provided data, a 58.4% response rate. Although 72.2% of programs indicated that they had DEI goals, only 35.2% reported measuring the effectiveness of strategies taken to address their goals. The results found differences in the engagement of public vs. private programs, with public programs reporting greater levels of toolkit usage and higher levels of engagement with DEI efforts. In addition, implementation

of the 21 best practices outlined in the toolkit varied widely across programs, with some practices being implemented widely while others were virtually untouched.

CONCLUSION: Although PA education programs are making strides towards diversity, there is still a great deal of work to be done. Having DEI goals is not enough, programs must engage in efforts to attract, recruit, and retain students, faculty, and staff from URM backgrounds.

FACULTY READINESS FOR A DIGITAL EDUCATION MODEL: A SELF-ASSESSMENT FROM HEALTH SCIENCES EDUCATORS

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Tecnologico de Monterrey | Tecnologico de Monterrey | Tecnologico de Monterrey | Tecnologico de Monterrey | Tecnologico de Monterrey

PURPOSE: During the COVID-19 pandemic, the continuity of education across the world is being supported through e-learning. Healthcare programs especially require continuing patient-centered training to benefit individuals and society. The objective of this study was to assess the faculty members' skills to continue educational services through a digital education model at the beginning of the lockdown.

METHODS: The methodology consisted in a quantitative approach descriptive and cross-sectional design. The instrument was a survey with two sections, i.e., (1) self-assessment and (2) self-ranking based on the digital education model.

RESULTS: The results for 497 participants indicated higher scores on active learning and web conference digital skills. Evaluation is still a competence required to be reinforced by the faculty to incorporate a full transition into online learning.

CONCLUSION: There seems to be an agreement about faculty readiness to implement different active learning strategies, despite being in a distance education model. University leaders welcomed the self-assessment that faculty members performed on digital skills as it allowed them to adapt the training programs and designate staff teams to support the educators once classes restarted. Educators implementing a digital education model should consider a planned and structured educational solution that is beyond the distance between learners and teachers, but an engaging environment for learning incorporating different technologies and active pedagogies.

A WEEK TO FLOURISH AND REFLECT ON PROFESSIONAL IDENTITY: "TEC WEEK"

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Tecnologico de Monterrey | Tecnologico de Monterrey | Tecnologico de Monterrey

PURPOSE: Professional identity requires the dynamic evolution of the individual, who forms relationships and assumes roles in various professional groups and contexts. Tec Week is an educational strategy that aims to shape professional identity while developing competencies through reflection, experimentation, and daily life experiences. This study aimed to identify the students' perceived value of their experiences during Tec Week to form professional identities and gain skills.

METHODS: A qualitative method was selected with focus groups' comments analyzed by emergent coding topics. It was gathered data from 33 students in two focus groups. The analysis of the information was carried out by coding emerging topics.

RESULTS: The coding of students' comments about the Tec Week activities and workshops evidenced the value of specific phases of professional identity developed from self-knowledge and collaboration in connected networks. Students appreciate the experience as they achieve introducing themselves to their own personal and professional identities. The Tec Weeks contemplated in this study offer various experiences that help students develop their transversal competencies and self-knowledge of their abilities.

CONCLUSIONS: The training approach of the Tec Weeks is oriented to personal and professional growth in topics of introspection, recognition of the other, and social impact, strengthening each student's professional identity. With this proposal, competencies are promoted to influence human flourishing.

BACK TO THE BASICS: A COURSE ON SCIENTIFIC LITERATURE CRITIQUE AS A MECHANISM TO INTEGRATE BASIC SCIENCE CONCEPTS INTO CLERKSHIP CURRICULA

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PURPOSE: Medical school curricular reforms designed to enhance learner integration of basic and clinical sciences have resulted in inclusion of clinically oriented pedagogies into the preclerkship period and a shift towards earlier student immersion into the clinical environment. These changes have resulted in shorter preclerkship curricula, with concurrent decreases in student exposure to foundational science content. To ensure that graduating medical students have a sufficiently nuanced understanding of the scientific foundation of medicine, instructional methodologies to revisit or build upon foundational concepts during the clinical years are needed. But barriers to successful vertical integration include logistics and limited tools/strategies.

METHODS: We designed a novel remote course for fourth year medical students entitled "Back to the Basics: Microbiologic Principles and Pharmacotherapy of Immunologic

and Infectious Disorders." This course utilizes a combination of student-led patient case presentations, asynchronous basic science lectures, and journal club discussion sessions to reinforce how basic science concepts form the foundation of clinical decision making. Upon completion, the students answered a survey to evaluate the strengths, weaknesses, and overall effectiveness of the course.

RESULTS: The course received an average student evaluation of 4.11/5 on a Likert scale of 1 (poor) to 5 (excellent), though students suggested that the course be expanded to include more basic sciences topics. Students were particularly enthused to master a new skill (literature critique) and review high-yield basic science concepts prior to taking the step 2 CK exam. Faculty observers noted that all participants demonstrated increased ability to critique the primary literature and to explain the basic science underpinnings of their patient cases.

CONCLUSIONS: Our novel literature-critique based course is a flexible and effective mechanism to promote integration of basic science concepts into the clerkship curriculum. It is easily adaptable to diverse curricular and instructional needs.

THE DIFFERENTIAL DIAGNOSIS AS A SNAPSHOT OF CLINICAL REASONING

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PURPOSE: This study evaluated potential utilization of clinical skills assessment (CSA) data to obtain insight into students' clinical reasoning.

METHODS: Following IRB approval, we accessed materials from our 2019 senior medical student CSA. Exam logistics: 15-min standardized patient encounter followed by 10 min to complete a patient note (interview, physical exam, differential diagnosis (DDx), justification, and management). This work focused on the DDx (up to 3 listed) and justification; patient presentations studied back pain and cough (2 versions each). Scenarios targeted consideration of potential diagnoses. Two investigators reviewed each note; diagnoses scored as high priority (HP), feasible (F), not feasible (NF); justification as full, partial, or absent. We analyzed frequency of diagnoses and quality of justification by case.

RESULTS: Most students ($n = 212$) listed three diagnoses. Students listing first diagnosis deemed high priority were back pain #1 ($N = 110$): 89.1%; back pain #2 ($n = 104$) 73.1%; cough #1 ($n = 106$) 42.5%; and cough #2 ($n = 100$) 76%. Students listing no high priority diagnosis ranged from 1 to 28.3%. While students offered many feasible diagnoses, some students also included one or more diagnoses not appropriate for the patient presentations. Diagnostic justifications varied widely, sometimes including data not documented in the interview or physical exam.

CONCLUSION: Students generally identified one high priority diagnosis, with variation by case. Despite listing many feasible diagnoses, students did not consistently highlight the most important consideration for a given context. Justification of diagnoses revealed limitations in integration and synthesis of patient data. Although accuracy of DDx and justification represent a window into student clinical reasoning, data from this work did not allow identification of student-specific issues.

IMPACT OF A COMMUNITY SERVICE LEARNING ROTATION ON STUDENT INTEREST IN WORKING WITH UNDERSERVED COMMUNITIES

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PURPOSE: Community Service Learning and Leadership is a 3-year curriculum designed to teach skills to work with New Jersey's medically underserved communities. Students are given the opportunity to utilize what they have learned over first and second years and apply this in their third year to the CSL rotation. The AHEC site coordinators and the NJ Program Office assist student teams in identifying community-based agencies and health promotion projects. This study focuses on the CSL rotations required of third year medical students. This study sought to ascertain student's interest in working with underserved communities before and after the rotation.

METHOD: Pre/post assessments were developed and given to all third year medical students who complete the rotation. The survey collects basic demographic information and data about respondents' intention to work with underserved populations. These results are compared to numbers in the post-test assessment, which is administered after the students complete the program.

RESULTS: From 2017 to 2020, 535 students completed pre/post assessments. The post assessments revealed that 84.62% respondents answered "yes" to the statement "I still personally want to be involved in providing care for the medically underserved during my medical career" after their rotation, an increase from 79.35% in the pre-survey data. Over 100 students are currently enrolled. About 82% of those surveyed indicated that they would like to serve in these communities. We expect the program will motivate more students to work in underserved communities.

CONCLUSION: Students were more likely to want to work with underserved communities in their medical career after the rotation. This is consistent with prior research that shows

that contact increases likelihood of working with underserved communities.

MEDICAL STUDENT MENTAL HEALTH DURING THE COVID-19 PANDEMIC

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PURPOSE: Americans experienced a mental health crisis alongside the COVID-19 pandemic. Given that medical students had proven more vulnerable than the general population to poor mental health prior to the pandemic, we sought to measure indicators of their mental health during the pandemic's peak.
METHODS: US allopathic and osteopathic medical students were invited to complete an anonymous mental health survey screening for depression, anxiety, burnout, suicidal ideation, and increased substance use during the height of the COVID-19 pandemic (late December 2020 through early January 2021). Potential relationships were explored between these mental health indicators and demographic and environmental factors, such as COVID-19 exposure, type of medical school curriculum, and utilization of mental health resources.
RESULTS: Of 960 medical students completing the full mental health survey, 25.1% ($n = 241$) screened positive for depression, 40.4% ($n = 388$) screened positive for anxiety, 21.3% ($n = 201$) met criteria for at least one dimension of burnout, 19.0% ($n = 182$) started or increased substance use, and 7.2% ($n = 69$) experienced suicidal ideation. Significant differences ($p < 0.01$) in measures of mental health were associated with female gender, those who had utilized mental health care resources, those with a personal COVID-19 diagnosis, and those who knew someone who died of COVID-19.
CONCLUSION: Rates of depression did not change for medical students during the pandemic, as they did for other populations, and rates of burnout and suicidal ideation were lower than expected. Substance use and anxiety among medical students were higher than pre-pandemic levels. Medical students who were female, those who had utilized mental health care resources, those with a personal COVID-19 diagnosis, or those who knew someone who died of COVID-19 were identified as particularly vulnerable groups.

A MASTER PROGRAM ENHANCES MEDICAL STUDENT DIVERSITY AND ITS GPA PREDICTS SUCCESS IN MEDICAL SCHOOL

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PURPOSE: Matriculation into medical school requires students to obtain a specific score on the MCAT and a GPA of 3.5–4.0. To increase student diversity and help unsuccessful students in this endeavor, Touro University Nevada (TUN) created a Master of Health Sciences (MHS) program with a rigorous curriculum to better prepare students for medical school. In addition to determining the contribution of the MHS program to diversity in medical school, this study aims to determine whether the MHS GPA is a good predictor of success in medical school.
METHODS: MHS GPA, OMS 1 and 2 GPAs, and Board Scores (COMLEX 1 and 2CE) from five TUN cohorts (2015–2019) were analyzed using Fisher's exact tests or simple linear regressions. Fisher's exact test determined the association between MHS students' success rate on COMLEX I and COMLEX 2CE. A simple linear regression evaluated the association between MHS and/or DO GPA and standardized exam scores.
RESULTS: The strongest predictor of COMLEX 1 score on the first attempt was MHS GPA (slope = 288, SE = 51, $p < 0.001$; $r2 = 0.43$), not DO GPA (slope = 37, SE = 102, $p = 0.73$; $r2 < 0.01$). For the COMLEX 2CE, the reverse was true, where the MHS GPA was a poor predictor of final score (slope = 150, SE = 88, $p = 0.10$; $r2 = 0.05$) and the DO GPA a better predictor (slope = 161, SE = 14, $p < 0.001$; $r2 = 0.30$). MHS GPA was a moderately strong predictor of DO GPA in the first (slope = 0.82, SE = 0.38, $p = 0.05$; $r2 = 0.20$) and second (slope = 1.24, SE = 0.44, $p = 0.02$; $r2 = 0.37$) years.
CONCLUSION: The MHS GPA is a statistically significant predictor of success in the first and second years of medical school. Moreover, the MHS GPA is a strong predictor of COMLEX 1 scores. Since no clinical experience exposure in the MHS program occurs, MHS GPA does not correlate with the COMLEX 2CE. Although a more comprehensive analysis is still underway, the preliminary data indicate that MHS students contribute considerably to diversity at TUN.

DEVELOPING A PROGRAM OF CLINICAL RESEARCH FOR RESIDENTS IN A RECENTLY ESTABLISHED GENERAL SURGERY RESIDENCY AT A COMMUNITY HOSPITAL

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Inspira Health Network | Inspira Health Network | Inspira Health Network | Inspira Health Network | Inspira Health Network

PURPOSE: General surgery training is a time-consuming endeavor and allocating dedicated time for scholarly activities

such as research is frequently difficult. This abstract describes how resident research was successfully incorporated into clinical curriculum of General Surgery residency.

METHODS: PGY1 residents complete online training (NIH and CITI courses) on human research subject protection. At the start of the PGY2 year, a faculty surgeon with part-time support from Graduate Medical Education is assigned to mentor each resident. Topics of interest are discussed with the resident, clinically relevant hypothesis formulated, and a research project structured. After institutional IRB approval, data is obtained from the Surgical Review Corporation's BOLD database, hospital EMR, and physical chart review. The GME office provides part-time hospital IT personnel to capture clinical data from the EMR, drastically reducing resident time and effort. Literature searches are facilitated by librarians in the affiliated medical school and an outside statistician is contracted as needed. Faculty mentors are involved at every stage of the research process, and residents are encouraged to collaborate with each other. Resulting abstracts are presented at regional and national academic meetings, followed by manuscripts submitted for publication.

RESULTS: Since the inception of the residency program in 2012, our trainees have presented 59 papers at national level research meetings, with 16 published abstracts and 35 manuscripts published in peer-reviewed journals. All graduating residents have at least one significant academic presentation, and most have up to eight publications in peer-reviewed journals.

CONCLUSIONS: With strong faculty and administration support, we have developed a strong and productive academic culture in a "young" General Surgery community hospital residency, despite the lack of formally protected research time. All residents are involved with highly collaborative scholarly activity from concept to publication. Our reputation for resident research has attracted many highly qualified applicants to our program.

MICRO-LECTURE EDUCATOR DEVELOPMENT PROGRAM USING TED MASTERCLASS: COHORT 2

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PURPOSE: Declining attendance for lectures may be attributed to excessive length, lack of engagement, and over-complexity of information. Medical students seemed to favor commercially available resources which presented medical information in short, focused segments. Since students desire to also learn from internal faculty, we developed a curriculum to train health professions educators to create these short, focused presentations called micro-lectures. TED Masterclass was the primary learning resource.

METHODS: In 2020, the first cohort of 25 educators completed a 6-month program. Based on feedback, the curriculum was revised and shortened. Over 4 months, participants (a) asynchronously completed 11 TED Masterclass lessons (short videos and associated activities) which focused on presentation and communication skills, (b) engaged in monthly accountability sessions focusing on skill application and collegial dialogue, (c) completed supplemental learning activities on Blackboard, and (d) uploaded a recorded micro-lecture. Participants received constructive feedback on their micro-lecture from fellow participants and the program instructors.

RESULTS: In 2021, 38 interdisciplinary educators from 4 health professions schools at one institution participated in the second cohort with 25 successfully completing all lessons and 18 completing all required components of the program including submitting a recorded micro-lecture. Surveys indicated that participants felt confident in their ability to apply the TED skills and will continue to incorporate the skills in their teaching. Participants reported improvement in their presentations and their ability to create more focused lectures. All respondents indicated a commitment to change their instruction which included improved lecture quality with decreased lecture duration paired with active learning. These results are similar to the first cohort.

CONCLUSION: After implementing 2 cohorts and engaging with over 60 educators, we have valuable information from participants and through our own experiences to guide future curriculum development.

IMPACT OF COVID-19 PANDEMIC ON BURNOUT AND CLINICAL ROTATIONS FOR THIRD-YEAR MEDICAL STUDENTS

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PURPOSE: The COVID-19 pandemic greatly changed the daily experiences of third-year medical students. The purpose of this study was to assess the perceptions of third-year students at the Medical College of Georgia concerning the impact of COVID-19 on their well-being and education.

METHODS: Third-year medical students ($n = 29$ of 186 students) completed an online survey consisting of 95 multiple choice, Likert scale, and free-response questions assessing burnout, coping strategies, and academic plans. Burnout was assessed using the 1-item Maslach Burnout Inventory.

RESULTS: The majority of respondents (95%) reported experiencing some degree of burnout due to the COVID-19 pandemic, with 40% citing this burnout to be significant. Burnout was attributed to fewer interactions with friends and family (69%), worry about lack of adequate patient exposure (55%), and cancellations of rotations (51%). Students were also unable to go home as often as they would like (48%).

Students' level of self-reported happiness was negatively affected by their ability to go home (47%). Many respondents (80%) spend a week socializing with peers. Most report this as a significant decrease from previous years (55%). Respondents (65%) reported that the pandemic negatively impacted their personal plans for the summer. Interestingly, only 18% of students' choice of specialty was impacted by the pandemic.

CONCLUSION: The pandemic worsened burnout in third-year medical students. Multiple factors may explain this finding including that many students were not able to go home, spend time with their friends/family, or socialize frequently due to the pandemic. Continuing to explore the effects of the pandemic on medical students may further elucidate the changes that must be made to help students adjust to the new circumstances.

DESIGNING AND IMPLEMENTING A NEW RAPID SYNTHESIS PROGRAM FOR USMLE STEP 1 PREPARATION AT ROSS UNIVERSITY SCHOOL OF MEDICINE

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PURPOSE: The USMLE step 1 is an important milestone that needs to be achieved for residency attainment. At Ross University School of Medicine, we identified the need for additional academic support of our students during dedicated step 1 study period.

METHODS: We developed a novel 8-week Rapid Synthesis Program (RSP) at our Clinical Academy of Teaching and Learning during their independent step 1 study period. This program included 8 h per week of contact time divided into one weekly large group organ-system high-yield concept reviews, followed by weekly knowledge application MCQ sessions and supported by weekly individualized academic advising and counseling. The didactic component focused on synthesis of medical knowledge and clinical reasoning. Wellness checks were periodically in collaboration with our counseling center.

RESULT: One hundred forty-seven out of 223 participants students responded to the survey, from a cohort of 440 eligible students. We collected student perspective after the first launch of RSP. The students appreciated a structured program that focuses on their urgent needs to address curricular gaps and provide a virtual learning community of peers to practice application and integration of their medical knowledge. Eighty-eight percent of students found the sessions helpful in preparing for step 1; 92% found knowledge application helpful; 72% found the individual academic advising sessions helpful; 52% found the individual tutoring sessions helpful, and 82% found RSP helped integrate and synthesize medical knowledge with clinical reasoning aspects of patient care concepts; 84% would recommend RSP to other students preparing for step 1 during their dedicated period.

CONCLUSION: With recent changes in USMLE programming, it is important that medical schools understand the urgent needs on student's stress in preparation. These findings informed us to emphasize on continuous quality improvement and next steps will be to correlate the participation in the RSP program with NBME CBSE and step 1 outcomes.

USING ACTION LEARNING TO DEVELOP A MODEL FOR INCLUSIVE TEACHING IN A COVID-SPLIT COHORT

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PURPOSE: Medical Program at The University of Queensland enrols approximately 500 students/year; a significant number (~200) is international students. During the pandemic, international and domestic students were affected by lockdowns, restrictions, or inability to enter Australia. Student and staff were temporally and spatially separated. Similar disruptions may continue and the lessons learnt will improve future teaching. Regardless of physical or temporal location, all students must meet learning objectives, and learning experiences must be equitable and inclusive. Biomedical science teaching, necessarily integrated with in-person laboratory teaching, was particularly affected.

METHODS: We addressed this unique challenge via an action learning approach. Over three iterations, we used staff and student feedback to evaluate and improve teaching strategies. We present our approach to online resource development ranging from individual asynchronous resources, through to whole cohort synchronous activities.

RESULTS: Students partnered in the development of asynchronous resources aimed for their peers. All histology teaching was converted to online synchronous small group teaching in different time zones. Similarly, large group tutorials, integrated biomedical symposia, and lectures were offered online at times that suited most students, which allowed us to support discipline integration and promote student engagement in large groups. The approach

allowed us to support discipline integration and promote student engagement in large groups. Students experienced improved flexibility of learning and teaching consistency. Our approach reflects the relationship between technology and education.

CONCLUSIONS: We learnt lessons that will inform our practice post-pandemic. Careful content curation and delivery exploits different technological affordances. purpose-created online resources can be more effective than in-person teaching and are equitable for all students. Online teaching provides flexibility and inclusion for staff, contributing to staff satisfaction and well-being, and may allow teaching to be met more efficiently than in-person teaching. Finally, an online approach can better deliver an integrated curriculum.

SUPPLEMENTS DESIGNED TO AUGMENT FACULTY-DELIVERED CONTENT IN A COMPACT MEDICAL SCHOOL UNIT OF CELLULAR AND MOLECULAR BIOLOGY

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PURPOSE: Medical students at our institution are provided only 6 days of didactic presentations for an entire Unit of Cellular Biology. Supplementary materials, consisting of high-value fact sheets, and integrative quiz questions, were provided to help students assimilate the material.

METHODS: A needs analysis survey was sent to previous cohorts of students. From their responses, content from each didactic session from the previous year's unit was revisited and core concepts were identified and explained further. These concept sheets were then approved by the appropriate faculty before disseminating them to the MS1 class. Quiz question sets were also constructed and made available to the MS1s at the end of the first week. At the end of the unit, a survey was sent to the MS1 class to gauge usefulness and student well-being.

RESULTS: The initial survey demonstrated that students had difficulties knowing what to study and how to study the material within the strict time limitations of this unit and responded favorably to the provision of "high-yield" concept sheets. The post-unit survey ($n=69$) showed that virtually all (~93%) students used the sheets generally and half used them daily. Eighty-four percent thought they guided their understanding of the material, while 94% thought they should be used in other medical school blocks. Finally, 77% agreed that this supplement reduced their stress/anxiety throughout the unit. Similar RESULTS were obtained for the quiz questions provided.

CONCLUSION: A shortened basic sciences curriculum to accommodate a systems-based approach necessitates new formulae of initial presentation and reinforcement to maximize student retention of information. We found that students enjoyed using condensed, high-value "fact sheets" to accompany faculty's presentation of the material. We also found that the students' levels of stress and anxiety were reduced during their study and exam preparation periods. This model should be extended to other portions of the pre-clerkship curriculum, both at this institution as well as others.

"AND THE ANSWER IS!…" COMPARING DELIVERY MODALITIES OF A GAME-BASED LEARNING SESSION IN HEALTH PROFESSIONS EDUCATION

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PURPOSE: Game-based learning (GBL) is considered a reasonable alternative to traditional teaching methods. While well-designed GBL sessions have been shown to promote high levels of engagement and dynamic group discussion among learners, some faculty within health professions education continue to view GBL with skepticism. In this study, we explored different delivery modalities of a single GBL session and evaluated the effects on short- and long-term knowledge retention, as well as student satisfaction and engagement.

METHODS: We designed a GBL session based on the popular gameshow "Jeopardy!" for a second-year medical neuroscience course at a tri-campus medical school. The GBL session was delivered differently at each campus: synchronously with game elements; asynchronously using a web-based application; or synchronously without game elements using the web-based application. All learners were evaluated at 1 week (formative assessment) and 10 weeks (summative assessment) post session for short- and long-term knowledge retention, respectively.

RESULTS: Learners who participated in the synchronous GBL session with game elements had higher scores on formative and summative assessment items compared to learners receiving either of the other two modalities. Learners in the synchronous GBL with game elements group reported high levels of engagement, as well as high levels of satisfaction with the format and a strong preference over traditional lectures.

CONCLUSION: The present study suggests that participation in synchronous GBL sessions with game elements may correlate with greater success on subsequent assessments related to concepts covered in those sessions, as well as foster perceptions of higher levels of satisfaction and engagement among participants. In addition, learners indicated that being in-person made it much easier to review challenging concepts during the live session.

IMPROVED REFLECTIVE CAPACITY IN THIRD-YEAR MEDICAL STUDENTS DURING A TWO-WEEK PROFESSIONAL DEVELOPMENT COURSE

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PURPOSE: The COVID-19 pandemic made a significant impact on medical education, triggering substantial changes in both classroom and clinical learning environments. Students experienced rapid shifts and uncertainties in their education as a result. At Rocky Vista University, we developed a Critical Reflection and Professional Development (CRPD) course to enhance reflective capacity (RC) and foster students' response skills to changing practice environments.
METHODS: The CRPD course was delivered over 2-weeks to 3rd year medical students. The goal was to provide students with critical reflection skills to effectively navigate clinical practice during the pandemic and shape professional identity formation. Topics within the course included resiliency, coping skills, dealing with mistakes, identifying bias, value explorations, and support systems. Changes in RC were assessed pre- and post-course via anonymous responses to the Reflective Practice Questionnaire, a reliable 40 item self-reported measure of RC.
RESULTS: One hundred fifty-eight paired pre- and post-course responses showed a moderate to crucially important increase in RC at the conclusion of the course ($r = 0.40$, $p < 0.0001$). Subscales of RC include reflection in action, reflection on action, reflection with other, and self-appraisal. Students' general confidence, confidence communicating, and stress interacting with patients also increased moderately. Uncertainty and job satisfaction showed no change during the course, while desire for improvement decreased. Scores on each of the latter six non-reflection subscales correlated moderately with RC scores.
CONCLUSION: The CRPD course increased students' RC when measured in pre- and post-surveys. This increase, in addition to changes in the other reflection sub-scales, indicates the course met the primary goal of fostering skills for critical reflection. Additional investigation is needed to determine how students utilize reflection after course completion.

PROFESSIONAL DEVELOPMENT ADVISING IN UNDERGRADUATE MEDICAL EDUCATION: THE IMPORTANCE OF INFORMED AND INDIVIDUALIZED SUPPORT

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Medical College of Wisconsin | Medical College of Wisconsin | Medical College of Wisconsin | Medical College of Wisconsin | Medical College of Wisconsin | Medical College of Wisconsin | Medical College of Wisconsin | Medical College of Wisconsin | Medical

PURPOSE: Professional development is central to students' success through medical school, yet there is no generally accepted model to best integrate these aspects in the medical school curricula. In response, our institution implemented the Continuous Professional Development (CPD) course. The CPD course spans the third and fourth year of medical school with the goal of ensuring students' continued professional development towards meeting our school's global competencies for medical students. The objective of this study was to evaluate students' experiences and perceptions regarding the impact of their CPD director on their medical education experience, specifically the students' one-on-one interactions with their director.
METHODS: Students are assigned to a CPD faculty director who monitors the student's progression along our school's global competencies, rotation evaluations, and OSCE performance. The CPD director and student also engage in discussions regarding specialty choice. Medical students complete a survey at the end of the third and fourth year that serves as the CPD course's summative evaluation. The survey measures students' satisfaction on multiple CPD components, including their relationship with their director. We used statistical software to analyze quantitative data. We analyzed open-ended questions using content analysis techniques.
RESULTS: Of the 1203 evaluation reports submitted since 2016, 828 (70%) students indicated that they "strongly agreed" or "agreed" that their CPD director's feedback was useful. Nine hundred eight (75%) of students "strongly agreed" or "agreed" that their CPD director was accessible during times of need. Nine hundred eighty-six (82%) students rated their CPD director as "outstanding" or "very good."
CONCLUSIONS: Professional development is an important component of medical education and requires the use of innovative strategies. Our CPD course highlighted the value of one-on-one mentoring and feedback on competency progression and individualized advice on meeting students' career goals.

PATIENTS AS TRAINERS: IMPACT OF PATIENT ENCOUNTERS ON OSTEOPATHIC MEDICAL STUDENTS UNDERSTANDING OF SOCIOECOLOGICAL DETERMINANTS IN TYPE 2 DIABETES

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PURPOSE: At Michigan State University College of Osteopathic Medicine (MSUCOM), we have developed a novel

approach, called patient-as-a-trainer (PAT), to increase student awareness of the role socioecological factors have on T2DM patients and provide them with an early clinical experience. We aim to understand how having pre-clerkship medical students interact with a T2DM patient trainer affects their understanding of the impact social and economic factors have on T2DM patients.

METHODS: This is a qualitative study using a grounded theory approach where students were interviewed using questions designed to investigate their thoughts and feelings on the relationship between socioecological factors and T2DM. A team of student researchers solicited, scheduled, and conducted thirty interviews after a session in 2020 and another in 2021. As a team, students and faculty will parse the transcribed interviews to identify themes and define a theory that explains how using T2DM patients to train students affects their understanding of how socioecological factors influence T2DM patients.
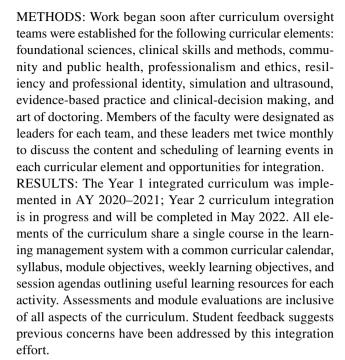
RESULTS: Preliminary results indicate that following the PAT session, students recognize the stigmas associated with T2DM and the importance of social and economic factors in disease management. They value the knowledge that the patient shared and see it as unique compared to what can be learned from reading a textbook/article or listening to a lecture. Students found the patient visit to be an important supplement to learning about the basic science and clinical aspects of the disease in lecture. Interestingly, they did not express any negative impressions of the webinar format compared to the intended in-person experience.

CONCLUSIONS: Following the PAT session, students conveyed an understanding of the complexities of living with T2DM. They found the interaction to be an important addition to material previously presented in readings and lecture.

INTEGRATING FOUNDATIONAL SCIENCE MODULES WITH THE ESSENTIALS OF CLINICAL MEDICINE COURSE: SUCCESSES AND REMAINING OPPORTUNITIES

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AU-UGA Medical Partnership

PURPOSE: Since originally developed 2009–2010, the foundational sciences modules and the Essentials of Clinical Medicine experience at the AU/UGA Medical Partnership have been managed as separate courses that run in parallel. While this met practical needs, students expressed concerns about differences in the operationalization of these courses. To make our curriculum even more student-centered, we undertook the task of integrating all aspects of our curriculum into a single series of modules. The purpose of this work is to share our experiences in integrating these two parallel arms of the curriculum.

METHODS: Work began soon after curriculum oversight teams were established for the following curricular elements: foundational sciences, clinical skills and methods, community and public health, professionalism and ethics, resiliency and professional identity, simulation and ultrasound, evidence-based practice and clinical-decision making, and art of doctoring. Members of the faculty were designated as leaders for each team, and these leaders met twice monthly to discuss the content and scheduling of learning events in each curricular element and opportunities for integration.

RESULTS: The Year 1 integrated curriculum was implemented in AY 2020–2021; Year 2 curriculum integration is in progress and will be completed in May 2022. All elements of the curriculum share a single course in the learning management system with a common curricular calendar, syllabus, module objectives, weekly learning objectives, and session agendas outlining useful learning resources for each activity. Assessments and module evaluations are inclusive of all aspects of the curriculum. Student feedback suggests previous concerns have been addressed by this integration effort.

CONCLUSION: We have successfully integrated all learning activities taking place in our curriculum into a series of all-inclusive curricular modules. We will share the process we used, provide exemplars of our integration efforts, and discuss opportunities for improvement. Future scholarship will explore the effectiveness of the integrated curriculum.

USING A PROJECT MANAGEMENT APPROACH IN DESIGN AND DEVELOPMENT OF THE CURRICULUM INVENTORY

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PURPOSE: A well-designed curriculum inventory (CI) has become a powerful tool for M.D. and D.O. Medical Schools to ensure continuous quality by tracking content, structure, delivery, and assessment of curricula. The process a medical school undergoes to create their CI is commonly referred to as mapping, and a functional map provides the ability to access data to answer essential questions related to curricular content, resource utilization, faculty workload, accreditation, and much more. Medical schools often design their map to align with and upload to the AAMC CI portal to benchmark their curriculum in reference to national aggregates. Although a number of private vendors have committed to following the AAMC CI technical standards, each vendor offers a different customizable product so that intricacies of individual school curricula may be captured. Development of CI platforms hosted by a vendor requires instructional technology expertise and may impede the progress of a

school without the appropriate technical expertise to communicate and advance the customization process. As many find CI development to be a challenging, lengthy, and often a frustrating endeavor, the primary aim is to assist others by reviewing and discussing collaborative CI development at multiple medical schools.

METHODS: In light of the opportunities and challenges in producing a well-designed CI, a project management approach was utilized to (1) initiate; (2) plan; (3) execute; and (4) assess the launch of a CI designed to track a complex 4-year undergraduate curricula at large medical school located in the Midwest.

RESULTS: Here, we share a strategic plan and success of a project management approach as well collaboration efforts across multiple medical school programs.

CONCLUSIONS: Discussion will include experiences, best practices, pitfalls, strategies, and resources available to assist other programs in developing and refining a highly functional curriculum map that is compliant with the AAMC CI.