Provost's Teaching with Technology DELTA Symposium

Johns Hopkins University | Online | Tuesday, May 4, 2021

AGENDA

OPENING REMARKS & KEYNOTE 9:00-10:30 AM (EDT)

Opening Remarks & Keynote

Zoom Link: https://wse.zoom.us/j/94972685206

09:00 – 9:15 AM - Opening Remarks/Keynote Intro
Dr. Sunil Kumar, Provost and Senior Vice President for Academic Affairs

09:15 – 10:15 AM - Keynote Address: "ENGAGE: Crafting J.E.D.I. Warrior Learning Community Strategies in the Age of Technology"
Dr. Tonya Matthews, Chief Executive Officer of the International African American Museum (IAAM)

10:15 – 10: 30 AM - DELTA Highlight
Dr. Stephen Gange, Executive Vice Provost, Academic Affairs; Professor, Bloomberg School of Public Health

Keynote Bio

Dr. Tonya M. Matthews is a thought-leader in institutionalized equity and inclusion frameworks, social entrepreneurship, and the intersectionality of formal and informal education.

Dr. Matthews is currently Chief Executive Officer of the International African American Museum (IAAM) located in Charleston, SC. at the historically sacred site of Gadsden's Wharf. IAAM is a champion of authentic, empathetic storytelling of American history and thus, one of the nation's newest platforms for the disruption of institutionalized racism as America continues the walk toward "a more perfect union."

Most recently, she served as Associate Provost for Inclusive Workforce Development & Director of the STEM Innovation Learning Center for Wayne State University and, prior to that, as the President & CEO of the Michigan Science Center, where she founded The STEMinista Project, a movement to engage girls in their future with STEM careers and tools.

Dr. Matthews is a published poet, included in 100 Best African-American Poems (2010) edited by Nikki Giovanni, and has written several articles and book chapters on inclusive governance, non-profit management, and fundraising.

Dr. Matthews received her Ph.D. in biomedical engineering from Johns Hopkins University and her B.S.E. in biomedical and electrical engineering from Duke University, alongside a certificate in African/African-American Studies. She is a member of Delta Sigma Sorority, Inc. and The Links, Inc. Dr. Matthews a native of Washington, D.C. and, in each community she has settled, is known for planting roots on the side of town best for keeping an eye on progress.

Open Case Studies: An Experiential Lesson Guide Delivery Platform [DELTA Grant]

Zoom Link: https://wse.zoom.us/j/99387265679

Presenters:
- Carrie Wright, PhD, Bloomberg School of Public Health
- Michael Breshock, BS, Whiting School of Engineering
- Qier Meng, BS, Bloomberg School of Public Health

Contributors:
- Stephanie Hicks, PhD, Bloomberg School of Public Health
- John Muschelli, PhD, Bloomberg School of Public Health
- Margaret Taub, PhD, Bloomberg School of Public Health
- Leah Jager, PhD, Bloomberg School of Public Health

The open case studies project (www.opencasestudies.org) is a living archive of current real-world problem-solving experiential guides. Currently we have focused on topics such as, public health, data science, and statistical methods. However, this approach of interactively guiding students step-by-step through a relevant real-world problem-solving challenge could be useful for student engagement in a diverse number of fields. Importantly with the pandemic we saw a need for public health, statistics, and bioengineering students to be more flexible with gathering and working with difficult data. Our case studies were already helping this cause, but we have adapted them to be even more engaging and accessible. We now have an interactive search tool for users to find case studies. Our guides also now include interactive quizzes and exercises that provide feedback in real-time. We have mitigated the barriers for students and instructors to access our data and code, and we have enabled our case studies to be translated into over one hundred written languages. Finally, we created a tool to help instructors more easily modify our existing case studies for their purposes and for instructors (of all computational experience levels) to create their own experiential guides. We will discuss and demonstrate all of these improvements to our project, as well as how we are evaluating the use of our case studies.

Broadening the message: Making videos more usable at Johns Hopkins University and beyond [DELTA Grant]

Zoom Link: https://wse.zoom.us/j/92132747009

Presenters:
- Jeff Day, M.D., M.A., School of Medicine
- Bonnielin Swenor, M.P.H., Ph.D., School of Medicine
- Donna Schnupp, M.A., School of Education
- Valerie Hartman, M.S., Peabody Institute
- Genevive Bjorn, M.Ed., School of Education

Short animated explainer videos can be effective ways to communicate important educational messages to the public because of their shareability, quick messaging, and engagement. Moreover, they can be widely

accessible to those with disabilities when following guidelines from Section 508 Amendment to the Rehabilitation Act of 1973 (Section 508). However, the guidelines for audio description (the narration of important visual elements on screen) are vague. In this project, we will create several explainer animations with varying amounts of narrated description, and test them with low-vision and normal-vision groups for preference. We will publish and report the results with the expectation that they can clarify user needs for audio description. The subject matter of the explainer animations will be used to promote the Johns Hopkins University Disability Health Research Center and Universal Design for Learning concepts, both of which will expand usability for all learners. We will also create and test a video on a public health topic. It is hoped that these engaging, sharable videos will inspire educators and creators in the Johns Hopkins community and beyond to think more universally about teaching and clarify needs for accessibility. This project partners the Schools of Medicine, Education and The Peabody Institute.

Quest2Learn: A Gamification and Augmented Reality Approach to Advance Education for online and in person lab sciences

Zoom Link: https://wse.zoom.us/j/91636624459

Presenters:
- Siddharth Ananth, Undergraduate, Whiting School of Engineering
- Rahul Swaminathan, Undergraduate, Whiting School of Engineering
- Shannon Wongvibulsin, MD-PhD candidate, School of Medicine
- Sangmin Woo, Undergraduate, Whiting School of Engineering
- Chinat Yu, Undergraduate, Whiting School of Engineering
- Jeffery Zhou, Undergraduate, Krieger School of Arts and Sciences

We will start by describing the need Quest2Learn fills, namely that remote lab sessions and pre-lab activities are primarily limited to pre-recorded videos, readings, and worksheets that only provide background information and steps for lab procedures, but do not provide the proper exposure and training for lab equipment and techniques. Next, participants will complete an interactive poll to share their experiences and what they hope can be achieved with an augmented reality app for education in lab sciences. Afterwards, we will share how our app can augment the laboratory experience through gamification of lab sessions and allow for virtual, yet tactile, lab experiences. Through a short video, we will highlight aspects of one of our virtual lab modules. Additionally, we will briefly describe some qualitative feedback we have collected from user research with students and professors. Next, we will discuss our timeline: what we have done so far, our progress to date, and what we are striving to achieve in the next semester/school year. Finally, after displaying a QR code to download the app, we will split into breakout rooms, each facilitated by a member of the Quest2Learn team in order to allow for a guided session for the symposium attendees. Following the breakout session, we will provide our contact information for future communication about potential collaborations and use of the app in their own lab courses. We will leave the final portion of the session for questions and discussion.

Finding Pearls in the Mud: Unexpected Wins Arising from Virtual Delivery of the Medical School Curriculum During the COVID-19 Pandemic

Zoom Link: https://wse.zoom.us/j/91945243276

Presenters:
- Sara Burns, MALS, School of Medicine
- Robert Kearns, MS, School of Medicine

- Lindsay Ledebur, MA, School of Medicine

With the onset of the COVID-19 pandemic in March 2020, the Johns Hopkins University School of Medicine faced the challenge of rapidly transitioning its entirely in-person undergraduate medical education curriculum to an online format. Although it was initially assumed that the measures taken to deliver medical school virtually would only be necessary until students could return to the classroom and the wards, they instead transformed the ways in which three previously disparate departments worked together to implement the curriculum, resulting in the use of innovative, technology-driven approaches to medical education that will remain in place beyond the pandemic's end. This presentation will briefly explore how the integration of three teams at the start of the pandemic set the stage for greater collaboration, resource-, and knowledge- sharing that enabled an environment in which innovation and creative problem-solving was able to thrive. We will then delve into three key changes that were made as a result of delivering the curriculum virtually, and that we have identified as being the most impactful for students. Our focus will be on why these approaches worked so well, their positive effects on student learning, and their broader applications – and implications – for the future.

These are:

• When Zoom Beats the Classroom: The Targeted Use of Video-conferencing for Specific Medical Education Activities

• Laying the Groundwork: The Thoughtful Use of Instructional Technology and Design to Enhance Medical Students' Learning Experience

• Telling the Whole Story: The Role of High-Quality Video in Content Delivery, Creation of Shared Stories, and Student Community

SESSION BLOCK II 11:45-12:30 PM (EDT)

Facilitating Lateral Communication: Students Share Writings with SharePoint

Zoom Link: https://wse.zoom.us/j/99387265679

Presenters:
- Marta Hanson, PhD, School of Medicine/Krieger School of Arts and Sciences
- Reid Sczerba, MA, Center for Educational Resources (Krieger School of Arts and Sciences/Whiting School of Engineering)

One of the most difficult things in teaching humanities is how to balance conveying content, augmenting critical thinking skills, and improving writing with productive ways to increase student-student interaction. This presentation discusses some ways that SharePoint can be used to transcend limits of top-down instruction of course content (i.e., lectures, assignments, tests, and leading discussions) by integrating more possibilities for students to engage laterally with each other. The resulting SharePoint website not only allowed students to read and contribute asynchronously via comments to their peers' writings, but also makes it possible for students to synchronously show their work on SharePoint pages as another way to contribute to online discussions as well as share drafts of their research projects, thereby facilitating student-student synergy and collaboration.   Since SharePoint is not typically thought of as an instructional platform, we will demonstrate how it has been successfully used to augment student engagement, interaction, and collaboration both synchronous and asynchronous teaching from two-week to semester-long courses. We will also express the benefits and the shortcomings of this approach for any faculty interested in pursuing a similar adoption for their courses.

The application of Teleophthalmology in the Diagnosis of Ophthalmic Emergencies among Trainees: A Pilot Study [DELTA Grant 2019]

Zoom Link: https://wse.zoom.us/j/92132747009

Presenters:
- Fasika Woreta, MD, MPH, School of Medicine
- Michael V. Boland, MD, PhD, Medical Director of Practice Innovation, Massachusetts Eye and Ear
- Michael Fliotsos, Post-doctoral fellow, Johns Hopkins University School of Medicine

Introduction: Resident utilization of telemedicine services in the ED may benefit resident education by improving diagnostic accuracy. The purpose of this study was to assess the implementation of a teleophthalmology tool in resident education in the ED setting. Methods: Ten first-year ophthalmology residents were trained to use a TopCon 3D OCT-1 Maestro System device to capture fundus photos and optical coherence tomography (OCT) images. The device was utilized to evaluate patients presenting to the ED presenting with ocular complaints. Findings were communicated to the supervising ophthalmologist. A retrospective chart review was conducted to obtain patient characteristics, ED diagnosis, and final ophthalmologist's diagnosis. Subjective image quality was graded by three independent graders on a scale of 1 (lowest) to 3 (highest). Results: From 12/2019 to 12/2020, the device was used in 116 patient encounters, capturing 900 images (average 7.8 images per encounter). The average age of patients was

48.8 yo (SD 17.1) and 41% were male. 43% of patients were White, 39% Black, 8% Hispanic/Latino, 4% Asian, 1% Native American, and 5% other. The average subjective image quality was 2/3. The imaging device was utilized most commonly for evaluation of papilledema (19.8%), new-onset visual acuity/visual field defects (12.1%), retinal detachment/tear (7.8%), trauma work-up (6.0%), and visual changes due to diabetic retinopathy (6.0%). Use of the TopCon device resulted in a change in diagnosis in 83 patients (72%). Conclusion: The use of telemedicine in the ED improved the diagnostic accuracy by residents. Further studies are need for expansion of teleophthalmology tools.

Deconstructing Healthcare Silos: Interprofessional Education Using Multiplayer Virtual Simulation and Virtual Reality for Medical & Nursing Trainees [DELTA Grant]

Zoom Link: https://wse.zoom.us/j/91636624459

Presenters:
- Kristen M. Brown, DNP, CRNP, CPNP-AC, CHSE-A, FAAN Assistant Professor & Advanced Practice Simulation Coordinator, School of Nursing
- Shawna Mudd, DNP, CRNP, CNE Associate Professor Coordinator, DNP Dual Pediatric Primary/Acute Care NP and Acute Care PNP Certificate Programs, School of Nursing
- Nicole Shilkofski, MD, MeD Endowed Professor Department of Pediatrics, School of Medicine
- Julianne S Perretta MSEd, RRT-NPS, CHSE-A Assistant Professor, Anesthesiology and Critical Care Medicine, School of Medicine; Director of Education and Innovation, Johns Hopkins Medicine Simulation Center

Simulation is used in academia to provide experiential learning opportunities in a safe environment. However, to provide students with a fully immersive simulation experience, there is the associated burden of cost, space restrictions and faculty. Virtual Simulation (VS) (screen-based) and virtual Reality (VR) (fully immersive) are tools that have the capacity to shape the way we deliver experiential learning in healthcare education. The goal of this project is to implement a VR training platform to provide interprofessional education (IPE) experiences for both the Johns Hopkins University School of Nursing and Medicine. This cutting-edge project will be the first VR/VS platform in nursing and medical education to utilize multi-player technology allowing for collaborative training and faculty debriefing to advance interprofessional education. Utilizing this platform for both asynchronous and synchronous training allows for repetitive practice to maintain knowledge and competency in a cost-efficient manner. This positively impacts the capacity for enrollment in online programs and the ability to further integrate simulated experiences into multiple programs which will produce a better prepared workforce impacting delivery of care.

Socratic Artificial Intelligence Learning (SAIL): A Virtual Study Assistant for Educating Medical Professionals [DELTA Grant]

Zoom Link: https://wse.zoom.us/j/91945243276

Presenters:
- Tuo Peter Li, MD, PhD, School of Medicine, Department of Orthopaedics

Contributors:

- Arpan Sahoo, Computer Science Major, Johns Hopkins University
- Stewart Slocum, Computer Science Major, Johns Hopkins University
- Jeanie Fung, Cognitive Science, Johns Hopkins University

- Alex Karius, Medical Degree Candidate, Johns Hopkins School of Medicine
- Dawn LaPorte, MD, Vice Chair of Education, Professor, Department of Orthopaedic Surgery, Johns Hopkins School of Medicine
- Alex Johnson, MD, Assistant Professor, Department of Orthopaedic Surgery, Johns Hopkins School of Medicine

Orthopaedic surgery physician resident trainees (orthopaedic residents) work up to 80 hours a week during their 5-6 year training program. In their limited leisure time, they must self-study hundreds of topics to prepare for yearly standardized exams and a final Boards certification exam. Balancing demanding work schedules and the high volume of study content is difficult, and a significant portion of test-takers fail each year. We plan to develop a virtual study assistant, named Socratic Artificial Intelligence Learning (SAIL), to augment the education of orthopaedic surgery physician residents. Drawing on state-of-the-art methods in natural language processing (NLP), SAIL will address knowledge gaps by engaging users with questions and answers in a conversational manner. The tool will evaluate the level of understanding demonstrated by user responses, which can then be integrated to adaptive learning algorithms that are part of existing orthopaedic education suites like Anki or Orthobullets. SAIL conversations will make use of highly vetted, topical question-answer interactions based on content from Orthobullets (an online orthopaedic study resource). Being a hands-free auditory learning tool, residents can study more on the go, i.e. while doing chores or commuting. But besides making studying more convenient and enjoyable, we believe that using SAIL in conjunction with other study methods can produce more learned physicians, bolstering patient care. We plan to evaluate SAIL with a short-term cross-over study of residents from the Johns Hopkins Department of Orthopaedic Surgery and neighboring institutions. We will gather data on the tool's accuracy, user-friendliness, and effectiveness for learning and memory.

SESSION BLOCK III 1:00-1:45 PM (EDT)

Engaging Students with MS Teams: 3 Case Studies from Lab Courses

Zoom Link: https://wse.zoom.us/j/99387265679

Presenters:
- Eileen Haase, PhD, Whiting School of Engineering
- Jamie Young, PhD, Krieger School of Arts and Sciences
- Rebecca Pearlman, PhD, Krieger School of Arts and Sciences

The 2020 pandemic forced many faculty to shift how they teach and rethink how they engaged students. This session describes the work of three faculty in WSE and KSAS who used Microsoft Teams to engage students with each other and the instructors. While the case studies focus on lab courses, the lessons learned are relevant to any course.

Future of Storytelling: 360 Video and the Case for Quality

Zoom Link: https://wse.zoom.us/j/92132747009

Presenters:
- David Toia, M.A. Video Production Supervisor, JHSPH Center for Teaching and Learning
- Amy Pinkerton, M.A. Instructional Designer, JHSPH Center for Teaching and Learning

In this session, Amy Pinkerton, Instructional Designer and David Toia, Video Production Supervisor from the Center for Teaching and Learning at the School of Public Health, will highlight pedagogical benefits of storytelling using 360 video to engage students with communities around the globe. The presenters will highlight the technical aspects of immersive 360 video technologies and share clips from "Inside COVID-19," a 360 degree video documentary produced for Oculus TV. They will then discuss some of the filmmaking techniques used and how they can be applied to create academic content. The presentation will include an examination of the importance of quality in educational video and demonstrate an analytical approach to evaluating content development. There will be opportunities for audience questions and comments throughout and the session will conclude with a Q&A. Participants in this session are encouraged to watch the "Inside COVID-19" documentary before the session by clicking here.

Note: If you are watching on a computer use your mouse to click and drag around the video to change your viewing angle, viewers on mobile devices can simply use their fingers to navigate the scene.

Mixed Reality Headsets in Teaching Laboratory Courses: Changing the Pedagogy through Remote Collaboration and Experimentation [DELTA Grant]

MS Teams Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_OTExNzgyOGMtNGUzYy00NWYzLTljZmYtMzFiZGE1YzA0ZGY2%40thread.v2/0?context=%7b%22Tid%22%3a%229fa4f438-b1e6-473b-803f-86f8aedf0dec%22%2c%22Oid%22%3a%221d3e569d-08cc-49c0-bb71-d56b7beab31d%22%7d

Presenters:
- Sakul Ratanalert, PhD, Whiting School of Engineering
- Orla Wilson, PhD, Whiting School of Engineering
- Meredith Safford, PhD, Krieger School of Arts and Sciences
- Patty McGuiggan, PhD, Whiting School of Engineering
- Luo Gu, PhD, Whiting School of Engineering
- Robert Leheny, PhD, Krieger School of Arts and Sciences

The transition to remote teaching has exposed a critical need in the science and engineering curriculum. In particular, how can the necessary laboratory skills be learned remotely? These skills not only involve scientific problem solving, but observational acuity and the ability to work collaboratively. To address this need, we are using mixed reality headsets coupled with electronic notebooks in lab-based courses in WSE and KSAS. The headsets enable not only real time remote visualization but an entire interactive laboratory experience to students participating remotely. This system will modernize the laboratory training experience, expand our educational offerings, and better prepare our students in their careers. In this session, we will showcase some basic and advanced functionalities of the mixed reality headsets, outline our journey to bring this technology to the classroom, and demonstrate both current and projected implementations of this suite of tools in teaching and research laboratories. We will also explore how instructors and students have responded and adapted to its use, including observations surrounding unexpected barriers to student engagement and steps we have taken towards overcoming them.

Improving Pediatric Cardiopulmonary Resuscitation Care via Augmented Reality [DELTA Grant]

Zoom Link: https://wse.zoom.us/j/91945243276

Presenters:
- Keith Kleinman, MD, School of Medicine
- Justin M Jeffers, MD MEHP, School of Medicine
- Therese Canares, MD, School of Medicine
- James Dean, MS, Applied Physics Laboratory

Augmented reality (AR), although prominent in other sectors, has been slow to infiltrate healthcare education. There are numerous opportunities to utilize AR in training current and future healthcare providers, specifically around resuscitation and cardiopulmonary resuscitation (CPR) performance. High quality CPR has been shown to improve pediatric cardiac arrest survival yet adherence to current guidelines for CPR performance is poor. Numerous attempts have been made to improve guideline adherence with varying degrees of success but there is still room for improvement. This project, in collaboration with the Johns Hopkins University Applied Physics Lab, aims to develop AR software to improve CPR education and performance by providing real-time feedback in the direct field of vision of someone performing chest compressions. This software will be integrated into existing AR hardware creating an affordable, portable,

and effective means of training and debriefing chest compression performance. The platform will be applied to a variety of learner groups across multiple disciplines.

Turning Zoombies into Students: Encouraging Community and Engagement in the Virtual University

Zoom Link: https://wse.zoom.us/j/92852046606

Presenters:
- Daniel H. Foster, PhD, Peabody Institute

This presentation focuses on my First-Year Seminar (FYS), "What Can Music Do For Us?" Instead of a topic-based course like "Math and Music" or "Opera and Literature," in order to attract students equally from Whiting, Peabody, and Krieger I based my seminar on a "big question" answerable from many academic perspectives. Because of its online modality and status as an inaugural FYS, as well as my aim to achieve some of the main pedagogical goals in CUE2, in this class I tried both tech and non-tech ways to support student-led learning communities and to stimulate student engagement. Humanities, science, engineering, and music students determined much of the syllabus' content and were encouraged to "dream big," both as individuals and in collaboration when designing large-scale projects. Each student provided us with texts (e.g., articles, podcasts, videos, or websites) that answered our class question about the uses of music. To further encourage collaboration, students were regularly given time together in Zoom without my presence. Sometimes to discuss an assigned question, sometimes just to casually chat. More structured collaboration included student-designed large-scale projects. By giving students class-time to talk privately in breakout rooms, they were able to choose partners for collaboration. Exhausting the possibilities of Zoom and its problems with disembodiment, distraction, and the digital divide, we then turned to Virtual Reality (VR). Extending these experiments further, next year I plan to teach a class where the students and I will meet regularly in a virtual classroom by wearing standalone VR headsets.

STUDENT PANEL & CLOSING REMARKS 2:00-3:00 PM (EDT)

Closing Panel & Remarks
Student Perspectives on Student Engagement

Zoom Link: https://wse.zoom.us/j/94972685206

Moderator:
Jonathan Suen, PhD Candidate, School of Nursing

Panelists:
- Melanie Bolden, Doctoral Student, MPH, Bloomberg School of Public Health
- Lara Villanueva, Undergraduate student, Peabody Institute
- Halle Teart, Undergraduate student, Krieger School of Arts & Sciences
- Mathison Hall, Masters student, Whiting School of Engineering

A student panel discussing their perspectives on student engagement in their courses at Johns Hopkins including suggestions instructors may want to consider adopting.