

Experiment Centric Pedagogy and Home-based Hands on Learning in STEM Summer 2021 Virtual Workshop

June 16 & 17, 2021

MSU|SOE

Clarence M. Mitchell, Jr.
School of Engineering

[Click Here
to Register](#)



About the Workshop

The coronavirus pandemic had forced colleges and universities to adopt completely online educational learning environments. There is a growing concern in STEM fields about how students will be able to achieve one of the major learning outcomes without conducting physical hands-on laboratory exercises; an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering/scientific judgement to draw conclusions (ABET Outcome 6). The purpose of the virtual workshop is to demonstrate the effectiveness of home-based hands-on learning activities in STEM during the pandemic as well as introduce faculty to Engineering and STEM Education research.

Speakers are national experts in hands-on- learning in STEM education: Dr. Kenneth Connor, Emeritus Professor from Rensselaer Polytechnic Institute the originator of Experimental Centric Pedagogy; Dr. Olusola Adesope, the Boeing Distinguished Professor of STEM education, Washington State University, Pullman WA; Dr. Solomon Alao, MSU AVP Assessment, Prof. Lea Rosenberry an expert in virtual learning platforms, Dr. Aldo Ferri, an expert in Hands on Learning in Engineering and other distinguished speakers.

Topics will include:

- Implementation & Effectiveness of Experimental Centric Pedagogy (ECP) during COVID-19
- STEM Education research methodology
- Assessment of the effectiveness of high impact pedagogy
- Refinement of ECP in the Lab & the Classroom and hands on activities in Engineering
- Effectively engaging students in a virtual environment

The free two-day workshop will be held on June 16 and June 17. Participants will be able to interact with the speakers during live sessions. All sessions will be recorded. Registered attendees will get access to all recordings. See the attached flyer and the bios. [Register today](#) or contact Dr. Oludare Owolabi for any questions at Oludare.Owolabi@Morgan.Edu.

Speaker Bios



Dr. Kenneth Connor

Dr. Kenneth Connor is a professor emeritus in the Department of Electrical, Computer, and Systems Engineering (ECSE) at Rensselaer Polytechnic Institute where he teaches courses on electromagnetics, electronics and instrumentation, plasma physics, electric power, and general engineering. His research involves plasma physics, electromagnetics, photonics, biomedical sensors, engineering education, diversity in the engineering workforce, and technology enhanced learning. He learned problem solving from his father (ran a gray iron foundry), his mother (a nurse) and grandparents (dairy farmers). He has had the great good fortune to always work with amazing people, most recently professors teaching circuits and electronics from 13 HBCU ECE programs and the faculty, staff and students of the SMART LIGHTING ERC, where he is the Education Director.



Dr. Olusola Adesope

Dr. Olusola Adesope is the Boeing distinguished professor of STEM education at Washington State University Pullman. His research interest is at the intersection of educational psychology, learning sciences, instructional design and technology. His recent research focuses on the cognitive and pedagogical underpinnings of learning with computer-based multimedia resources; knowledge representation through interactive concept maps & diagrams, evidence-based practices through meta-analyses and empirical research, learning analytics, and investigation of instructional principles and assessments in Science, Technology, Engineering and Mathematics (STEM) domains.



Dr. Solomon Alao

Dr. Solomon Alao is the Assistant Vice President for Outcome Assessment and Program Review at Morgan State University. He has also served as a Professor of Teacher Education at MSU and the Faculty Advisory Council for the Maryland Higher Education Commission. He has published numerous research studies, including his most recent work directly related entitled, "Data Driven Action Plans for Student Success and Inclusive Excellence". Dr. Alao was formally trained at Delaware State University and University of Maryland at College Park where he earned a doctorate in human development and educational psychology.



Prof. Lea Rosenberry

Prof. Lea Rosenberry is a national expert in virtual learning platforms, she is currently the IT Specialist in charge of delivering training for the Zoom and Kaltura services at Penn State University. Prior to joining Pen State, she taught mathematics online for Purdue Global over a period of fourteen years. During the pandemic, she had conducted numerous workshops nationally on how to effectively engage students on virtual platforms.



Dr. Aldo Ferri

Dr. Al Ferri received his BS degree in Mechanical Engineering from Lehigh University in 1981 and his PhD degree in Mechanical and Aerospace Engineering from Princeton University in 1985. Since 1985, he has been a faculty member in the School of Mechanical Engineering at Georgia Tech, where he now serves as Professor and Associate Chair for Undergraduate Studies. Dr. Ferri's research has received funding from a number of sources including: Honeywell, Inc., the National Science Foundation, NASA, The Air Force Office of Scientific Research, the Office of Naval Research, and General Motors Corporation. Since joining the School of Mechanical Engineering in 1985, he has taught a wide variety of classes in dynamics, modeling, control, numerical methods, and vibrations. His research areas are in the fields of dynamics, controls, vibrations, and acoustics. He is also active in course and curriculum development. He is a Fellow of the ASME.

Speaker Bios



Dr. Zoran Zvovar

Dr. Zoran Zvovar is a fellow and the director of university programs at Analog Devices, the manufacturer of the electronic devices utilized in ECP. He was the recipient of the Semiconductor Research Corporation (SRC) 2020 champion award. He was recognized for his support of and deep engagement within the programs that ADI is a member of, which include JUMP, nCORE, Hardware Security, and India Research Program. His Achievements include contributions to multiuser detection in fading channels; design of integrated solutions for wireless systems. He is also senior Member Institute of Electrical and Electronics Engineers. He earned his Doctor of Philosophy in Electrical Engineering from Northeastern University in 1993. Dr. Zoran Zvonar has been listed as a noteworthy electrical engineer by Marquis Who's Who.



Dr. John Jackman

Dr. Jackman is a program director in the Division of Undergraduate Education at the National Science Foundation where he serves as a co-lead program director for the Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR) Program. He received his Bachelor of Science degree in Chemistry from Rensselaer Polytechnic Institute and his PhD in Industrial Engineering from Penn State University. He is currently on the faculty of Iowa State University as an Associate Professor of Industrial Engineering. He is a member of the American Society for Engineering Education and the Institute of Industrial and Systems Engineers where he has served as president of the Manufacturing and Design Division. In 2018, he received the John L. Imhoff Global Excellence Award for Industrial Engineering Education from American Society of Engineering Education.

Dr. Cheryl Rollings

Dr. Rollins is the Director of Institutional Research at Morgan State University. She also serves as an adjunct professor in the Graduate Program in Psychometrics and a Research Associate in the Center for Predictive Analytics. Previously, she was the Director of the Institutional Research at Arkansas.gov.



Dr. Avis Jackson

Dr. Avis Jackson joined the Center for Predictive Analytics in the summer of 2020 as Program Coordinator. Currently, she is assisting with several projects including Walter Reed Army Institute of Research (WRAIR) NIH SEPA grant, Medical Education Resources Initiative for Teens (MERIT)- Baltimore NIH SEPA proposal, Noncognitive Instrument Construction (NIC) - Determining Indicators of Success/ETS-FACETS, and others.

Dr. Olushola Emiola-Owolabi



Dr. Emiola-Owolabi is an expert in classroom observation and assessment of teaching effectiveness. She has equally worked on project titled: "Undergraduate Engineering Teaching Pedagogy Approaches of Teaching to Motivate and Retain Engineering Students". She is also a Higher Educational Administrator specialist with special interest in crisis management and reputation management. She had previously developed strategic campaign for crisis communication and public relation events for a higher educational institution in Africa.

Speaker Bios



Dr. Eric Sheppard

Dr. Eric Sheppard is a Program Officer in the Division of Undergraduate Education, where he works on the Advanced Technological Education (ATE), Improving Undergraduate STEM Education (IUSE), and Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) programs. He joined NSF in July 2020 under the Visiting Scientist, Engineer and Educator (VSEE) Program. He is a native of Brooklyn, New York, and grew up there and in Westbrook, Maine. He received his bachelor's degree in Aerospace Engineering from Boston University and his Master's (S.M.) and Doctorate (Sc.D.) degrees in Aeronautics and Astronautics from the Massachusetts Institute of Technology, and his areas of interest are space propulsion and aerospace design, as well as undergraduate engineering education and the pathway to graduate education. Eric has held teaching, research, and administrative positions at Tuskegee University and Hampton University (where he was Dean of Engineering and Technology for 12.5 years) and is an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA). He is Chair of the Interdisciplinary Consortium for Research and Education Access in Science and Engineering (InCREASE), a network supporting research opportunities for MSI faculty and students.

Dr. Jonathan Velasco



Dr. Jonathan Velasco is an Assistant Professor in the department of Chemistry at Colorado State University at Pueblo . He earned his Doctorate in Chemical Education from University of Nebraska – Lincoln. He is author of the journal titled: Characterizing Instructional Practice in the Laboratory: The Laboratory Observation Protocol for Undergraduate STEM (LOPUS). His research interest are follows: Students' Use of Academic Language – Language is an important aspect of chemistry education, as students are often called upon to not just familiarize themselves with vocabulary, but also to interpret and/or create graphs, charts, and equations. These latter forms of language in the chemistry classroom are encoded with various amounts of information that students must also negotiate in order to come to an understanding. Access to, and mastery of, this academic language of chemistry also affords them a status of membership within the scientific community as well as greater confidence in expressing their knowledge of the material. However, there have been several noted difficulties with students' acquisition of academic language; this is a critical issue in that students often learn the language as they learn the material, and language mastery is often related to student performance. Also, the inability to acquire academic language may be observed even in students whose native language is similar to the institution's, as the language of instruction may have the same native source but with its own unique forms that make it distinct. Our research involves the identification and classification of students' language use in terms of academic sophistication to better understand their level of understanding and aid in curriculum development.

Dr. Robin Getz



Dr. Robin Getz is the director of systems engineering at Analog Devices . He Grew and managed a 30+ member multi-disciplinary (Hardware, Software, device drivers, GUI, algorithms, HDL, MATLAB/Simulink, Labview, etc) engineering team, spread across 5 geographies (Beijing, China; Cluj-Napoca Romania; General Trias, Philippines; Munich, Germany; Wilmington, US), which developed systems based on a combination of ADI's high speed and precision products and complementary 3rd party products. He also designs and implements strategic analysis, strategic planning, and program management functions and communicates this to senior management. He equally develops programs and collaborates with 3rd-parties. He also creates business plans aligned to address ADI/3rd party needs and then measures and reports the resulting business impact. Additionally, he creates and delivers technical and teaching materials and demos for tradeshow, roadshows, customer seminars, educational events, on-line webinars, labs, demos and applications notes. He also works with cross-functional teams on new product features definition, capabilities and solutions, supporting new product planning process with system level definition input of team. Others include working on high volume board designs, overseeing schematic capture, layouts, initial and volume manufacturing, EMI, ESD and vibration testing for regulatory compliance (CE, FCC), and production test development, and mechanical design for boxing/packaging.

Schedule

Date	Time	Topic	Objective	Presenter(s)
6/16/2021	9:00 – 9:05 am	Introduction	Project overview & goals for workshop	Gaulee & Owolabi
	9:15 – 12:15 pm	Implementation of ECP during the pandemic & Fall 2021 Plan	Each Discipline will present their experience and challenges with the Implementation of ECP and inexpensive hands-on homebased lab exercises in Spring 2020-Spring 2021 the proposed Fall 2021 projects.	Discipline Faculty (Biology, Physics, IE, CE, Chemistry, Transportation) <i>Moderator: Owolabi</i>
	12:15 – 12:45 am	Lunch on Your Own		
	12:45 am-1:45 pm	Educational Research Methodology	Intro to educational research, details about research methodology and analysis, how to conduct meta-analysis and develop theoretical framework for intervention in STEM educ.	Adesope
	1:45 – 2:45 pm	Assessment of High Impact Pedagogy	Details about faculty effectiveness, peer review of faculty teaching through classroom observation, measurement of faculty effectiveness in the four domains of teaching.	Alao
	2:45 – 3:45 pm	Classroom observation	New Classroom Observation Protocol for Laboratory and Virtual Platform.	Emiola-Owolabi
	3:45 – 4:45 pm	Assessment of ECP	The use of course evaluation and institutional data to measure the effectiveness of ECP.	Rollings and Jackson
	4:45 – 5:00 pm		Discussion and closing	Owolabi
6/17/2021	9:00 – 10:00 am	Refinement of ECP	Refinement of ECP in the lab and the classroom	Connor
	10:00 – 10:30 am	Q & A		
	10:30 am-11:30 am		Effectively engaging students in a virtual environment.	Rosenberry
	11:30 – 12:00 pm	Break NSF Grants	Grant Opportunities at the Division of Undergraduate Education of NSF	Sheppard
	12:00 – 1:00 pm	Lunch on Your Own		
	1:00 – 2:00 pm	Hands-on Activities	Hands-On Learning (HOL) in Engineering.	Connor
	2:00 – 2:30 pm	Break		
	2:30 – 3:30 pm	Hands-on Devices	Development and improvement of M1k and M2K hands-on devices.	Zvonar/Getz
3.30-4.00pm		Discussion, Evaluation and Wrap Up	Gaulee, Owolabi & Bista	



Welcoming the national and international presenters and participants

9:00 am

Dr. Oscar Barton

Dean, Clarence M. Mitchell, Jr. School of Engineering

Morgan State University



Introduction of the Next Speaker

Dr. Mulugeta Dugda

Department of Electrical and Computer Engineering

Morgan State University



Refinement of ECP in the Lab and in the Classroom

9:05am-10:30 am

Keynote Speaker

Dr. Kenneth Connor

Professor Emeritus, the Department of Electrical, Computer, and Systems Engineering
Rensselaer Polytechnic Institute



Introduction of the Next Speaker

Dr. Samira Ahangari

Department of Transportation and Urban Infrastructure Studies

Morgan State University



Effectively Engaging Students in a Virtual Environment

10:30am-11:30 am

Keynote Speaker

Prof. Lea Rosenbery

IT Specialist in charge of delivering training for the Zoom and
Kaltura services at Penn State University



Introduction of the Next Speaker

Dr. Gbeke Oguntimein
Department of Civil Engineering
Morgan State University



Grant Opportunities at the Division of Undergraduate Education of NSF

11:30am-12:00 pm

Keynote Speaker

Dr. Eric Sheppard

Program Officer, the Division of Undergraduate Education

National Science Foundation

Lunch on Your Own

12:00 -1:00 pm





Hands on Learning in Engineering

1:00 pm-2:00 pm

Keynote Speaker

Dr. Kenneth Connor

Professor Emeritus, the Department of Electrical, Computer, and Systems Engineering

Rensselaer Polytechnic Institute

2:00 – 2:30 pm

**BREAK
TIME**



Introduction of the Next Speakers

Dr. Neda Shourabi

Department of Electrical and Computer Engineering

Morgan State University



Development and Improvement of M1k and M2k Hands-On Devices

2:30pm-3:30 pm

Keynote Speaker

Robin Getz

Director of Systems Engineering at Analog Devices



Development and Improvement of M1k and M2k Hands-On Devices

2:30pm-3:30 pm

Keynote Speaker

Dr. Zoran Zvovar

Fellow and the Director of University Programs at Analog Devices

Discussion, Evaluation and Wrap Up

3:30-4:00pm

Moderators

Dr. Owolabi and Dr. Bista, Dr. Gaulee