



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

# Abstract Book

2<sup>nd</sup> Educational Justice Conference  
22-25 July 2024, Athens, Greece

Edited by  
Chevelle Hall & Olga Gkounta

2024



Abstracts  
2<sup>nd</sup> Educational Justice  
Conference  
22-25 July 2024, Athens, Greece

Edited by  
Chevelle Hall & Olga Gkounta

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## TABLE OF CONTENTS

*(In Alphabetical Order by Author's Family Name)*

<b>Preface</b>		7
<b>Editors' Note</b>		9
<b>Organizing &amp; Scientific Committee</b>		10
<b>Conference Program</b>		11
1.	<b>Students' Involvement in the Development of Greener Organic Chemistry Labs</b> <i>Elena Atrazheva</i>	15
2.	<b>Using Adaptive Learning in Teaching for Activism through STEM and the Humanities</b> <i>Valerie P. Bennett</i>	16
3.	<b>CQUni Connect: Inspiring Transitions to Higher Education for Young People in Regional</b> <i>Corey Bloomfield &amp; Linda Lorenza</i>	17
4.	<b>The Importance of Knowledge Management in a Digitalized World with Changes in the Workforce due to Retirement</b> <i>Rolf Blumentritt</i>	18
5.	<b>The Importance of Arts Education in a Post-COVID World</b> <i>Nicolas Alberto Dosman</i>	19
6.	<b>Ducks in Space: Application of Cal Poly's "Learn By Doing" Approach to Mature "Duck" Radios for Future Space Flight</b> <i>Steve Dunton</i>	21
7.	<b>Establishing and Sustaining a Computer Science Ecosystem for Diverse Learners</b> <i>Valeisha Ellis</i>	22
8.	<b>Leveling the Board: Mastering Recruitment &amp; Retention</b> <i>Scott England, Richard Warren &amp; Kala Burrell</i>	23
9.	<b>Small-Scale Hybrid Electric Vehicle Testbed as Practical Instructional Tool for Education in Transportation Electrification</b> <i>Poria Fajri</i>	24
10.	<b>Black Women in Leadership and the Complexities of Work Life Balance</b> <i>Arifah Goodwin</i>	26
11.	<b>Development of Translatable Point-of-Care Diagnostics in an Academic Setting and Opportunities for Multidisciplinary Student Training</b> <i>Katerina Kourentzi</i>	27
12.	<b>School Counselors Post-Pandemic Support of Eighth-Grade Students with Social-Emotional Learning Challenges</b> <i>Marlyn Pierce</i>	29
13.	<b>Advancing Sustainability Education: A Review of Integrating Life Cycle Assessment (LCA) in Higher Education</b> <i>Abdul Rauf, Muhammed Tariq Shafiq &amp; Malik Khalfan</i>	30

14.	<b>Development and Practice of Teaching Materials for Early STEAM Education of Elementary and Junior High School Students Using Tiling</b> <i>Michihiro Sakai</i>	31
15.	<b>Inclusive Abstraction: Teaching Eva Hesse in the South Bronx</b> <i>Elizabeth Scheer</i>	32
16.	<b>e: Leveling the Playing Field: Social Justice and Inclusion of International Education for Black Students</b> <i>Vivian Shannon-Ramsey</i>	33
17.	<b>Mathematics and Physics</b> <i>Towfic Shomar</i>	34
18.	<b>Constructing Wave Function Using Parametric Equations</b> <i>Andrzej Sokolowski</i>	35
19.	<b>Integrating Entrepreneurial Mindset and Value Creation in Teaching Physics to Engineering Students for Innovation and Impact</b> <i>Izabela Stroe</i>	36
20.	<b>The Politics of Leading: An Analysis of Trustee Decisions to Appoint Women Presidents at Historically Black Colleges and Universities From 2020-2023</b> <i>Linda Taylor</i>	37
21.	<b>Creating the 21<sup>st</sup> Century Engineer for Sustainable Development and Social Justice</b> <i>John Paul Tharakan</i>	38
22.	<b>Cooperation and Narrative Sharing: Building a Co-Creative Teaching and Learning Situation through Quasi-Theatrical Teamwork</b> <i>Ching-pin Tseng</i>	40
23.	<b>The Pros and Cons of Diversity, Equity, and Inclusion Positions in America</b> <i>Willis Walter, Britine Perkins &amp; Chevelle Hall</i>	42
24.	<b>REU Pathways: Pathways for Community College Students to Enrich their Education and Careers</b> <i>Abe Zeid</i>	43
25.	<b>LLM-Based Physics Analysis Agent at BESIII and Exploration of Future AI Scientist</b> <i>Yiyu Zhang, Ke Li &amp; Zhengde Zhang</i>	45
<b>References</b>		46

## Preface

This book includes the abstracts of all the papers presented at the *2<sup>nd</sup> Educational Justice Conference* (22-25 July 2024), organized by the Athens Institute for Education and Research (ATINER) and the Virginia State University.

A full conference program can be found before the relevant abstracts. In accordance with ATINER's Publication Policy, the papers presented during this conference will be considered for inclusion in one of ATINER's many publications only after a blind peer review process.

The purpose of this abstract book is to provide members of ATINER and other academics around the world with a resource through which they can discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the association. ATINER was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world can meet to exchange ideas on their research and consider the future developments of their fields of study.

To facilitate the communication, a new references section includes all the abstract books published as part of this conference (Table 1). I invite the readers to access these abstract books –these are available for free– and compare how the themes of the conference have evolved over the years. According to ATINER's mission, the presenters in these conferences are coming from many different countries, presenting various topics.

**Table 1.** *Publication of Books of Abstracts of Proceedings, 2023-2024*

<b>Year</b>	<b>Papers</b>	<b>Countries</b>	<b>References</b>
2024	25	9	Hall and Gkounta (2024)
2023	N/A	N/A	N/A

It is our hope that through ATINER's conferences and publications, Athens will become a place where academics and researchers from all over the world can regularly meet to discuss the developments of their disciplines and present their work. Since 1995, ATINER has organized more than 400 international conferences and has published over 200 books. Academically, the institute is organized into 7 divisions and 37 units. Each unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the

administration staff of ATINER for putting this conference and its subsequent publications together.

**Gregory T. Papanikos**  
**President**



## **Editors' Note**

These abstracts provide a vital means to the dissemination of scholarly inquiry in the field of Educational Justice. The breadth and depth of research approaches and topics represented in this book underscores the diversity of the conference.

ATINER's mission is to bring together academics from all corners of the world in order to engage with each other, brainstorm, exchange ideas, be inspired by one another, and once they are back in their institutions and countries to implement what they have acquired. The 2nd Educational Justice Conference accomplished this goal by bringing together academics and scholars from 9 different countries (Australia, Canada, China, Germany, Japan, Taiwan, UAE, UK, USA), which brought in the conference the perspectives of many different country approaches and realities in the field.

Publishing this book can help that spirit of engaged scholarship continue into the future. With our joint efforts, the next editions of this conference will be even better. We hope that this abstract book as a whole will be both of interest and of value to the reading audience.

**Chevelle Hall & Olga Gkounta**  
**Editors**

## **2<sup>nd</sup> Educational Justice Conference, 22-25 July 2024, Athens, Greece**

### **Organizing & Scientific Committee**

All ATINER's conferences are organized by the Academic Council. This conference has been organized with the assistance of the following academic members of ATINER, who contributed by reviewing the submitted abstracts and papers.

1. Gregory T. Papanikos, President, ATINER & Honorary Professor, University of Stirling, U.K.
2. Chevelle Hall, Associate Professor, Virginia State University, USA.
3. Willis Walter, Dean, College of Education, Virginia State University, USA.
4. Linda Taylor, PhD Student, Virginia State University, USA.

# FINAL CONFERENCE PROGRAM

2<sup>nd</sup> Educational Justice Conference, 22-25 July 2024, Athens, Greece

## PROGRAM

08.30-09.15

Registration

09:15-10:00

Opening and Welcoming Remarks:

- **Gregory T. Papanikos**, President, The Athens Institute.

10:00-11:30 Session 1- Educational Justice/STEAM

**Moderator: Alevtina Goulko**, Chair and Instructor, Chemical Technology Program, Northern Alberta Institute of Technology, Canada.

1. **Michihiro Sakai**, Professor, Kurume College, Japan.  
*Title: Development and Practice of Teaching Materials for Early STEAM Education of Elementary and Junior High School Students Using Tiling.*
2. **Andrzej Sokolowski**, Adjunct Professor, Lone Star College, Houston, USA.  
*Title: Constructing Wave Function Using Parametric Equations.*

11:30-13:00 Session 2- Educational Justice/STEAM

**Moderator: Corey Bloomfield**, Senior Lecturer, Central Queensland University, Australia.

1. **Willis Walter**, Dean, College of Education, Virginia State University, USA.  
**Britine Perkins**, Assistant Professor, Prairie View A&M University, USA.  
**Chevelle Hall**, Associate Professor, Virginia State University, USA.  
*Title: The Pros and Cons of Diversity, Equity, and Inclusion Positions in America.*
2. **Arifah Goodwin**, Assistant Director of Employer Relations, Virginia State University, USA.  
*Title: Black Women in Leadership and the Complexities of Work Life Balance.*

13:00-14:30 Session 3- Educational Justice/STEAM

**Moderator: Willis Walter**, Dean, College of Education, Virginia State University, USA.

1. **Richard Warren**, Professor, University of Maryland Eastern Shore, USA.  
**Kala Burrell**, Associate Professor, University of Maryland Eastern Shore, USA.  
**Scott England**, Professor, University of Maryland Eastern Shore, USA.  
*Title: Leveling the Board: Mastering Recruitment & Retention.*
2. **Vivian Shannon-Ramsey**, Assistant Professor, Bowie State University, USA.  
*Title: e: Leveling the Playing Field: Social Justice and Inclusion of International Education for Black Students.*
3. **Elizabeth Scheer**, Literature Faculty, Bard High School Early College, USA.  
*Title: Inclusive Abstraction: Teaching Eva Hesse in the South Bronx.*

14:30-15:30 Lunch

15:30-17:00 Session 4

**Moderator: Sanaa Sabour Alaoui**, Professor, University Sultan Moulay Slimane, Morocco.

1. **Rolf Blumentritt**, Professor, University of Applied Science Heilbronn, Germany. The Importance of Knowledge Management in a Digitalized World with Changes in the Workforce due to Retirement.
2. **Poria Fajri**, Associate Professor, University of Nevada, Reno, USA.  
*Title: Small-Scale Hybrid Electric Vehicle Testbed as Practical Instructional Tool for Education in Transportation Electrification.*
3. **Katerina Kourentzi**, Research Associate Professor, University of Houston – Chemical & Biomolecular Engineering, USA.  
*Title: Development of Translatable Point-of-Care Diagnostics in an Academic Setting and Opportunities for Multidisciplinary Student Training.*

4. **Steve Dunton**, Lecturer, California Polytechnic State University, USA.  
*Title: Ducks in Space: Application of Cal Poly's "Learn By Doing" Approach to Mature "Duck" Radios for Future Space Flight.*

**17:00-19:00 Session 5 – A Roundtable Discussion on “The Future of Sciences and Engineering Education”**

**Moderator: Gregory T. Papanikos**, President, Athens Institute.

**Invited Speakers:**

1. **Nikos J. Mourtos**, Professor & Chair, San Jose State University, USA.  
*Title: AI In Science and Engineering Education: Friend or Foe?*
2. **Subramaniam Balakrishnan**, Professor Emeritus, University of Manitoba, Canada.  
*Title: Challenges In Providing Hands on Experience in Teaching Automation in a Mechanical Engineering Program.*
3. **Towfic Shomar**, Professor, University of Jordan, Jordan and Research Associate, CPNSS-LSE, UK.  
*Title: AI and Science: Geeting Humans back to the Picture.*
4. **Nikolaos Dimakis**, Professor and Chair, University of Texas Rio Grande Valley, USA.  
*Title: The Future of Online Education in Engineering and STEM.*
5. **Edvard Kokanyan**, Head of the Chair of Physics, Armenian State Pedagogical University, Armenia.  
*Title: Some Features of Studying at a Pedagogical (Teacher Training) University.*
6. **Adrian Ionescu**, Professor of Math and Computer Science, Wagner College, USA.  
*Title: The Future of Programming in the Computer Science Education.*

**Interventions:**

1. **Willis Walter**, Dean, College of Education, Virginia State University, USA.
2. **Bala Maheswaran**, Director, Engineering Division, Athens Institute & Professor, Northeastern University, USA.
3. **Lakshmi Sankar**, Regents Professor, Georgia Institute of Technology, USA.
4. **Steve Dunton**, Lecturer, California Polytechnic State University, USA.
5. **Alexander Zestos**, Associate Professor, American University, USA.
6. **Sanaa Sabour Alaoui**, Professor, University Sultan Moulay Slimane, Morocco.
7. **Adam Gadomski**, Professor, Bydgoszcz University of Science and Technology, Poland.

20:30-22:30

**Athenian Early Evening Symposium (includes in order of appearance: continuous academic discussions, dinner, wine/water, music)**

**Tuesday 23 July 2024**

**09:00-10:30 Session 6**

**Moderator: Katerina Kourentzi**, Research Associate Professor, University of Houston – Chemical & Biomolecular Engineering, USA.

1. **Towfic Shomar**, Full Professor, University of Jordan, Jordan & Research Associate, CPNSS – LSE, UK.  
*Title: Mathematics and Physics.*
2. **Abe Zeid**, Professor, Northeastern University, USA.  
*Title: REU Pathways: Pathways for Community College Students to Enrich their Education and Careers.*
3. **Yiyu Zhang**, Researcher, Institute of High Energy Physics, China.  
*Title: LLM-Based Physics Analysis Agent at BESIII and Exploration of Future AI Scientist.*
4. **Elena Atrazheva**, Instructor, Northern Alberta Institute of Technology, Canada.  
*Title: Students' Involvement in the Development of Greener Organic Chemistry Labs.*

**10:30-12:00 Session 7- Educational Justice/STEAM**

**Moderator: Chevelle Hall**, Associate Professor, Virginia State University, USA.

1. **Corey Bloomfield**, Senior Lecturer, Central Queensland University, Australia.  
**Linda Lorenza**, Senior Lecturer, Central Queensland University, Australia.  
*Title: CQUni Connect: Inspiring Transitions to Higher Education for Young People in Regional.*
2. **Marlyn Pierce**, School Testing Coordinator / School Counselor Assistant, Suffolk Public Schools, USA.  
*Title: School Counselors Post-Pandemic Support of Eighth-Grade Students with Social-Emotional Learning Challenges.*
3. **Linda Taylor**, PhD Student, Virginia State University, USA.  
*Title: The Politics of Leading: An Analysis of Trustee Decisions to Appoint Women Presidents at Historically Black Colleges and Universities From 2020-2023.*
4. **Nicolas Alberto Dosman**, Assistant Professor, University of California, Davis, USA.  
*Title: The Importance of Arts Education in a Post-COVID World.*

**12:00-13:30 Session 8- Educational Justice/STEAM**

**Moderator: Elena Atrazheva**, Instructor, Northern Alberta Institute of Technology, Canada.

1. **Abdul Rauf**, Assistant Professor, United Arab Emirates University, UAE.  
*Title: Advancing Sustainability Education: A Review of Integrating Life Cycle Assessment (LCA) in Higher Education.*
2. **Ching-pin Tseng**, Associate Professor, National Sun Yat-sen University, Taiwan.  
*Title: Cooperation and Narrative Sharing: Building a Co-Creative Teaching and Learning Situation through Quasi-Theatrical Teamwork.*
3. **Izabela Stroe**, Associate Professor, Worcester Polytechnic Institute, USA.  
*Title: Integrating Entrepreneurial Mindset and Value Creation in Teaching Physics to Engineering Students for Innovation and Impact.*

**13:30-14:30 Lunch**

**14:30-16:00 Session 9- Educational Justice/STEAM**

**Moderator: Konstantinos Manolidis**, Athens Institute Administration.

1. **Valeisha Ellis**, Assistant Professor, Spelman College, USA.  
*Title: Establishing and Sustaining a Computer Science Ecosystem for Diverse Learners.*
2. **Valerie P. Bennett**, Assistant Professor, Clark Atlanta University, USA.  
*Title: Using Adaptive Learning in Teaching for Activism through STEM and the Humanities.*
3. **John Paul Tharakan**, Professor, Howard University, USA.  
*Title: Creating the 21<sup>st</sup> Century Engineer for Sustainable Development and Social Justice.*

**17:30-20:00 Session 10**

**Old and New-An Educational Urban Walk**

The urban walk ticket is not included as part of your registration fee. It includes transportation costs and the cost to enter the Parthenon and the other monuments on the Acropolis Hill. The urban walk tour includes the broader area of Athens. Among other sites, it includes: Zappion, Syntagma Square, Temple of Olympian Zeus, Ancient Roman Agora and on Acropolis Hill: the Propylaea, the Temple of Athena Nike, the Erechtheion, and the Parthenon. The program of the tour may be adjusted, if there is a need beyond our control. This is a private event organized by ATINER exclusively for the conference participants.

**21:00-22:30**

**Ancient Athenian Dinner**

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**Wednesday 24 July 2024**  
**An Educational Visit to Selected Islands**  
**or Mycenae Visit**

**Thursday 25 July 2024**  
**Visiting the Oracle of Delphi**

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**Friday 26 July 2024**  
**Visiting the Ancient Corinth and Cape Sounion**

**Elena Atrazheva**

Instructor, Northern Alberta Institute of Technology, Canada

## **Students' Involvement in the Development of Greener Organic Chemistry Labs**

Senior level students were involved in curriculum development of the laboratory component of the first-year organic chemistry course at NAIT. Students tested and evaluated the experiments as part of a special research-focused course. All experiments have been adapted to three-hour lab periods and laboratory conditions at NAIT.

Several green organic chemistry experiments were incorporated into the first-year organic chemistry course, focusing on several areas: replacing unsafe chemicals, decreasing the amounts of materials used, and using green reagents.

One adaptation was the synthesis of 4-bromoacetanilide via electrophilic aromatic substitution. Sodium bromide and acetic acid were used to generate the brominating agent *in situ*, thus avoiding traditional use of bromine and increasing the safety of the materials used.

The isolation of trimyristin from nutmeg by solvent extraction was also adapted to use fewer materials. The reduction in materials used did not affect the product yield, and sufficient product was available for analysis.

The third experiment was the adaptation of the green chemistry extraction of limonene from orange peel, where students used a novel method of extraction using supercritical fluid CO<sub>2</sub>, a known green reagent. By replacing the flammable solvent with inert CO<sub>2</sub>, the greener extraction method resulted in greater process safety, reduced waste, and improved product purity.

Lastly, the experiment on synthesis of biodegradable polymers was developed using polylactic acid as an example. The degree of polymerization was identified using <sup>1</sup>H-NMR spectroscopy. The various degradation conditions for the synthesized polymers were investigated.

**Valerie P. Bennett**

Assistant Professor, Clark Atlanta University, USA

## **Using Adaptive Learning in Teaching for Activism through STEM and the Humanities**

Over the last several years, particularly following the COVID-19 pandemic coupled with civil and social unrest, educational researchers, P-12 practitioners, governmental leaders and policy makers have begun to inquire more deeply into the ways that teachers are uniquely positioned as activists. In this work, the authors posit that STEM and humanities courses should both be recognized as important avenues for introducing P-12 students to social justice and activist work and raising their socio-political consciousness. By reimagining traditional learning spaces, the authors explore transformative possibilities that can emerge when curriculum is approached through a multidisciplinary lens to effectively engage “teaching as activism” in the 21st century and beyond. Extant educational scholarship has largely preoccupied itself with centering social justice and activist pursuits in education through the lens of humanities courses (History, English Language Arts, Civics Education) but a broader view is presented in this work to include STEM (Science, Technology, Engineering and Math). The inclusion of the full spectrum of courses widens the net for the impact of teaching for activism using adaptive learning (AL) platforms. This seemingly oxymoronic application of AL platforms to raise consciousness in teachers and in students is postulated to not only spark action, but has the potential to produce systemic, sustainable change.



**Corey Bloomfield**

Senior Lecturer, Central Queensland University, Australia

&

**Linda Lorenza**

Senior Lecturer, Central Queensland University, Australia

## **CQUni Connect: Inspiring Transitions to Higher Education for Young People in Regional**

Inspiring participation in higher education promotes opportunities to further the educational justice agenda. Aspiration-building programs open the door to education possibilities that have historically been closed to many young people living in regional/rural/remote contexts.

CQU Connect program is an aspiration-building and career-focused initiative targeting students in regional/remote, low SES, and First Nations communities in Australia. The program, spanning from upper primary to Year 12, aims to improve Year 12 university application rates by empowering students with knowledge, confidence, and study skills. In 2023 an enhancement review of the program revealed the need for a comprehensive curriculum review, addressing issues with lesson plans, audience appropriateness, and resource efficiencies.

Framed within a Critical Theory approach to educational justice, this paper reports on the review project's findings using Kirkpatrick's 4 level evaluative model. Considerations were made for the importance of a participatory approach when adapting the program to diverse school environments, considering regional and socioeconomic variations. The project focused on refining content, developing adaptable teaching resources, and incorporating interactive elements to improve engagement. Project staff engaged with key stakeholders in the enhancement phase, including school leaders, program delivery staff, and secondary school students. In addition to the curriculum resource development, emphasis was placed on the significance of professional development for non-educator staff delivering the program and the need for a strategic approach to resource allocation.

This paper seeks to contribute valuable insights to the field of educational outreach and enabling programs, considering leading practice models through collaboration with school stakeholder groups to ensure the importance of tailored education equity transitions for diverse student populations.

**Rolf Blumentritt**

Professor, University of Applied Science Heilbronn, Germany

## **The Importance of Knowledge Management in a Digitalized World with Changes in the Workforce due to Retirement**

This article deals with the topic of knowledge management and various methods that help to deal with knowledge. In many companies, there is a strong interest in utilising existing knowledge.

Knowledge management is an important component of a company's success, as internal and external knowledge is highly relevant for competitive orientation in the present and future. By establishing comprehensive knowledge management in the company, information can be captured more quickly and internal expertise can be improved throughout the entire organisation.

The generation and exchange of countless data and information between humans and machines is constantly increasing. This raises the question of how an advantage can be generated from this exploding flood of data and information. The digital transformation is becoming increasingly important and therefore also affects knowledge. Digitalisation means that knowledge can be learned and used more quickly and in a more diversified way, which in turn has a positive impact on the company.

In recent years, the fundamental activities of knowledge management have changed significantly. Due to the rapid change in knowledge, methods are becoming increasingly important and must be constantly adapted or react in a more agile manner.

The following content examines how companies deal with the increased volume of data associated with digitalization, the knowledge transfer of departing employees and how this can be achieved as successfully as possible.

**Nicolas Alberto Dosman**

Assistant Professor, University of California, Davis, USA

## **The Importance of Arts Education in a Post-COVID World**

The value of arts education has been called into question for decades. At the height of the COVID-19 pandemic, arts education programs, particularly singing were considered dangerous. Some music education programs continued to exist and operate via zoom while others were eliminated. However, music and the need to create and perform music continued throughout the pandemic. Virtual performances were a temporary means of moving forward with the performing arts. Moreover, creativity had evolved, and new skills were developed to continue with the performing arts and music in society. As the pandemic ended and life returned to normal, the need and value of arts education should have been apparent. However, arts education programs still struggle for its place in the curriculum.

In a post-pandemic world, many arts education programs were able to return but some have never returned. Moreover, economically challenged communities may have experienced more obstacles in restoring arts education programs. STEM rather than STEAM continues to be the focus of secondary and post-secondary institutions as well as law makers. Arts education, even those that have been able to reconstitute themselves and have found the necessary support to do so from their communities, may experience challenges that have lingered since the pandemic. These challenges could be linked to a variety of factors such as post-pandemic fear, inflation, economic challenges, as well as a re-prioritization of resources.

It may be necessary to remind policymakers and decision makers of the value of arts education to society. The arts are a vital part of the human experience. The pandemic in many ways reinforced the need for the arts despite the inability to experience live performances in the same way that had been experienced prior to the pandemic. Music making and performances continued despite the limitations during this period of human history. Given the state of COVID and its ability to be managed, attending a performance, or participating as a performer has returned to pre-pandemic levels. Although audience attendance and performer participation may not have fully returned to pre-pandemic levels in every community, the performing arts have largely recovered at the professional level.

Arts education programs are now in a position to fully thrive, and the case should be made for their importance - especially in socioeconomically challenged areas. The pandemic has made it clear

that human beings are compelled to make art and will continue to do so in the foreseeable future. Evidence of the importance of arts education prior, during, and post-pandemic will make the case for STEAM as a means of moving forward in the 21<sup>st</sup> century and beyond.

**Steve Dunton**

Lecturer, California Polytechnic State University, USA

## **Ducks in Space: Application of Cal Poly's "Learn by Doing" Approach to Mature "Duck" Radios for Future Space Flight**

This paper gives an overview of Cal Poly's multi-year collaboration with technology startup *OWL Integrations*, and focusses on Cal Poly's "Learn By Doing" approach to mature *OWL's* technology for a future space flight mission. *OWL Integrations* makes low-cost Duck radios for emergency responders that form mesh networks using *OWL's* Cluster Duck Protocol (CDP). Cal Poly is a top-ranked public university in California that implements Learn By Doing as a deliberate process where students acquire knowledge and skills through active engagement in research and development projects. Since 2019, Cal Poly has characterized and matured Duck radio electronics and firmware, improving throughput, robustness, and supply chain trust. As the co-creator of the CubeSat standard, Cal Poly is a spacefaring university (since 2006) and is evolving Duck radios for space readiness. Student leadership and participation have been critical to both the collaboration's success and student learning. Over twenty students from four different engineering disciplines are currently involved in this research and development effort.

**Valeisha Ellis**

Assistant Professor, Spelman College, USA

## **Establishing and Sustaining a Computer Science Ecosystem for Diverse Learners**

The need for educators in Computer Science (CS) has been an ongoing battle in our current context. Although many states across the United States have adopted K-12 Computer Science Education standards, educator preparation programs need evidence-based CS curriculum and materials to prepare future educators to implement CS instruction and provide meaningful CS engagement for K-12 students to meet the existing CS education mandate. This research will provide innovative solutions to our K-12 STEM community, address the current challenges of CS workforce diversity, lack of CS career exposure for educators and K-12 students, and heighten CS engagement. This research will have a five-fold impact: K-12 students, STEM Educators/ Majors, CS workforce innovation, CS/STEM identity, and increase CS community engagement with K-12 schools and community partners. This culturally relevant K-20 Computer Science community-based scholarship will contribute to the scant research on culturally sustainable CS content, pedagogy, and practices by providing pre-service and in-service educators evidence-based CS professional development on CS strategies, materials, out of school experiences (OST/OSL) that honors the rich STEM practices within CS Education at three Historically Black Colleges and Universities (HBCUs) while developing STEM Global citizens that solve real-world issues.

**Scott England**

Professor, University of Maryland Eastern Shore, USA

**Richard Warren**

Professor, University of Maryland Eastern Shore, USA

&

**Kala Burrell**

Associate Professor, University of Maryland Eastern Shore, USA

**Leveling the Board:  
Mastering Recruitment & Retention**

NOT AVAILABLE

**Poria Fajri**

Associate Professor, University of Nevada, Reno, USA

## **Small-Scale Hybrid Electric Vehicle Testbed as Practical Instructional Tool for Education in Transportation Electrification**

As the subject of transportation electrification becomes increasingly important, it is essential to educate students and familiarize them with the basic operating principles of electric vehicles (EVs) and hybrid electric vehicles (HEVs). Study of these vehicles requires exposure to a variety of concepts and covers a broad array of topics. In recent years, instructional efforts aiming to educate students in the field of transportation electrification have come in the form of books and research articles describing these vehicles and their components, software packages that can perform advanced simulations of vehicle behaviors, hardware-in-the-loop (HIL) simulations on a test bench, and real vehicle tests.

While there are ample books available that provide narrative descriptions of these vehicles and their components, and different software packages have the capability to do advanced simulations, none provide the practical aspects of education. On the other hand, although real vehicle tests and HIL simulations facilitate a hands-on, intuitive, and interactive experience, these methods are very expensive to implement at universities and often require a dedicated and complex system that is difficult to reconfigure for educational purposes. All these make it challenging for electrical engineering departments to offer hands-on educational programs that target transportation electrification.

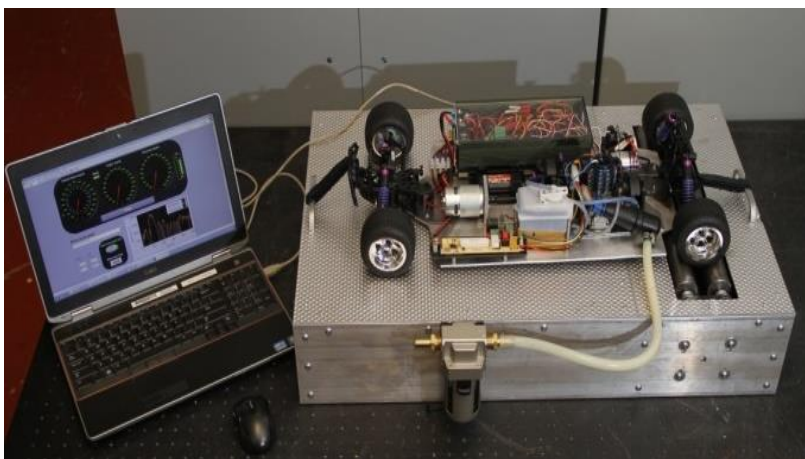
To provide a viable solution to overcome current limitations in transportation electrification education and at the same time increase student motivation in learning fundamental electrical engineering concepts applicable to this field, the idea of small scale HEV setup is discussed in this presentation. The idea of a small-scale HEV originates from the fact that all the components of a real HEV are available in a smaller scale and by properly combining the parts in the same configuration as a real HEV, a very close model of the actual vehicle can be achieved.

The discussed testbed in this presentation is shown in Figure 1 and not only serves as an academic educational tool to study different aspects of EVs and HEVs, but can also be taken to various schools and community events and be utilized as a demonstration and education unit, with the aim of generating interest in the pursuit of engineering



among younger audiences. The testbed is reconfigurable, safe to operate (low voltage/low currents), and has the flexibility to be easily upgraded with different components such as different battery sizes and chemistries, different electric motor types, and other components commonly used in these vehicles. Due to its reconfigurable and upgradable design, a wide variety of topics can be explored which is otherwise impossible when using a non-reconfigurable platform as a teaching tool.

**Figure 1.** *Developed Small-scale HEV Test Bench at the University of Nevada Reno*



**Arifah Goodwin**

Assistant Director of Employer Relations, Virginia State University,  
USA

**Black Women in Leadership and the Complexities of Work  
Life Balance**

NOT AVAILABLE

**Katerina Kourentzi**

Research Associate Professor, University of Houston - Chemical & Biomolecular Engineering, USA

**Development of Translatable Point-of-Care Diagnostics in an Academic Setting and Opportunities for Multidisciplinary Student Training**

The COVID-19 pandemic highlighted the need for sensitive, usable, affordable point-of-care (POC) diagnostics for disease screening and surveillance. Lateral Flow Assays (LFAs) continue to be the preferred format for POC diagnostics because they are rapid, affordable, and user-friendly. Our research group at University of Houston focuses on the development of novel analytical methods for clinical diagnostics, especially tests using novel reporter particles. During this lecture I will discuss examples of our efforts to engineer novel diagnostic technologies using nanoparticles and engineered phage and the resulting opportunities for student learning and training across multiple disciplines.

One example involves the engineering of a new, universal class of LFA reporters by conjugating filamentous M13 phage with antibodies and peroxidase reporter enzymes. M13 phage are stable, non-hazardous, monodisperse, neutrally buoyant, under Darwinian selection for non-aggregation and low nonspecific stickiness, and easy to produce in large quantities. We demonstrated a novel platform technology for highly sensitive LFAs employing M13-based chemiluminescent reporters, read by a smartphone and compatible with clinical samples. Extensive screening of commercially-available antibody pairs led to a limit-of-detection of 100 pg/mL of SARS-CoV-2 nucleoprotein in nasal swab extract when the test was imaged and analyzed by an *in-house* developed smartphone reader. We also demonstrated good performance with positive clinical samples. Beyond COVID-19 diagnostics, the phage LFA platform technology has very broad applicability to the detection of pathogens, protein biomarkers, food toxins, and environmental contaminants at the point of care/need.

More recently, we developed a new approach to simple, inexpensive Lateral Flow Assays (LFAs) of great sensitivity, based on the glow stick peroxyoxalate chemistry widely used in emergency settings and in children's toys. The "Glow" LFA platform using standard fluorescent nanoparticle reporters in an assay format in which optical excitation is replaced by chemical excitation. The one-step chemi-excitation of fluorescent particles produces visible light readable by an unmodified smartphone, enhancing sensitivity while preserving simplicity and cost-effectiveness. Our Glow LFA detected the common model analyte human

chorionic gonadotropin with a limit of detection of 39 pg/mL- over ten times more sensitive than standard gold nanoparticles using the same antibodies. Significantly, multiple fluorescent dyes can be chemi-excited by a single reagent, allowing for color multiplexing on a single LFA strip with a smartphone camera. We also completed a pandemic-driven National Institutes of Health, Rapid Acceleration of Diagnostics (NIH-RADx) effort aimed at developing a Glow LFA diagnostic for COVID-19 infection. We were not able to reach the point of commercialization within the limited time and resources available, but we did achieve strong proof-of-concept and advanced the translational aspects of the platform, including high-performance Glow LFAs (demonstrated limit of detection 100 pg/mL SARS-CoV-2 nucleoprotein and 280 TCID<sub>50</sub>/mL of gamma-inactivated virions in nasal swab extract) reading by iPhone (and an in-house developed app) using only a plastic darkbox with no lens, and convenient dropper-format packaging of excitation liquid.

**Marlyn Pierce**

School Testing Coordinator/School Counselor Assistant, Suffolk Public Schools, USA

## **School Counselors Post-Pandemic Support of Eighth-Grade Students with Social-Emotional Learning Challenges**

In 2020, the world was forced to adjust to a new normal with the global pandemic. Every nation had to make difficult decisions to protect citizens and save their economy. Leaders of all institutions had to strategize quickly for an unknown future. Many institutions suffered, including education. Social-emotional learning addresses students' positive development of their social relationships, responsiveness, emotional parameters, healthy personalities, personal and joint objectives, alignment, and responsibility in decision-making (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2020). Research data were collected utilizing quantitative research methods and the SPSS analyzing program, allowing social-emotional learning data to be abstracted and analyzed through surveys and one-on-one interviews with eighth-grade school counselors. This education professional must be committed to providing SEL support to assist eighth-grade students with more successful behavior and academics that will benefit their education as a life-long journey. Establishing a more formal SEL Program, policy, and procedure implementation and refining the professional development of educators will be shown and deciphered. Mirroring social-emotional learning and skills to the Virginia Department of Education's goals for improved academic and behavioral results can facilitate the more effective implementation of a stellar SEL program within the school setting. This orderly literature review will examine the relationship between school social-emotional learning programs, education level transitioning, and academic outcomes.

**Abdul Rauf**

Assistant Professor, United Arab Emirates University, UAE

**Malik Khalfan**

Associate Professor, Khalifa University, UAE

&

**Muhammed Tariq Shafiq**

Associate Professor, United Arab Emirates University, UAE

## **Advancing Sustainability Education: A Review of Integrating Life Cycle Assessment (LCA) in Higher Education**

Life Cycle Assessment (LCA) is a comprehensive approach for evaluating the environmental impacts of products and services throughout their life cycles. LCA can play a pivotal role in educating future professionals on sustainable practices. This paper presents a review of the integration of LCA into higher education, focusing on its role in fostering sustainability and environmental awareness across diverse academic disciplines. This review explores the various approaches used to integrate LCA into academic curricula and the challenges, benefits and advancement associated with its implementation. The methodology employed in this review involves a comprehensive analysis of existing literature in higher education. By examining the strategies adopted by higher education institutes to incorporate LCA, this paper provides insights into contemporary practices and advancements in LCA education for students. The review finds multiple benefits of integrating LCA into higher education, including promoting interdisciplinary learning, enhancing critical thinking skills, and preparing students for careers that prioritize environmental stewardship. Furthermore, it addresses the challenges faced by educators, including resource constraints, the need for specialized training, and the continuous updating of course materials to reflect the latest developments in LCA methodologies. Additionally, this review highlights the importance of establishing a shared comprehension of teaching LCA concerning its content, literacy levels, and competencies. Finally, this paper emphasizes the need for ongoing research and collaboration among academia, industry, and policymakers to further enhance the integration of LCA into educational curricula and drive sustainable practices in the future.

**Michihiro Sakai**  
Professor, Kurume College, Japan

## **Development and Practice of Teaching Materials for Early STEAM Education of Elementary and Junior High School Students Using Tiling**

In Society 5.0, the concept of a future society developed by the Japanese government, human resources from STEAM with skills to grasp things from multiple perspectives and solve problems will be required. Furthermore, Society 5.0 indicates that the National Institute of Technology (KOSEN) will become a STEAM center for elementary and junior high school students as part of the efforts to establish a system that supports STEAM education. Since 2019, we have practiced STEAM education as part of “Liberal Arts Seminar” to fourth year students in the main course (first year of the undergraduate course). In this seminar, teachers of subjects in liberal arts present themes using their own specialties, such as mathematics, debate, and economics. Collaborative learning of students from various departments led them to deep learning, which is a fusion of knowledge and creation. Nonetheless, there are few opportunities to give back to society, especially as a platform for disseminating acquired mathematical ability. Therefore, we aimed to realize early STEAM education and give back to society by creating STEAM teaching materials on tiling for open courses for elementary and junior high school students by engaging students who studied tiling as teaching assistants in this seminar.

We considered a teaching material on tiling, such as Escher’s print, from the perspective of STEAM education as a fusion of art and mathematics. Since the age of ancient Greeks, the tiling problem asks what types of figures can be used for tiling. It is known from these times that any triangle or square can be used for tiling. Because tiling is easily understood visually and requires little prior knowledge to grasp it, it is suitable as a STEAM learning material for a large number of generations.

The purpose of the course was not only to arouse students' interest in mathematics but also to provide them with clues to develop their multifaceted ideas. We introduced a STEAM teaching material on tiling and considered the results of an open course. In the course, we examined what kind of (same-shaped) tiles could cover a plane and sphere. The findings revealed that elementary and junior high school students provided high survey ratings to this course, while teaching assistants had an invaluable opportunity to give back to society by applying their acquired skills.

**Elizabeth Scheer**

Literature Faculty, Bard High School Early College, USA

**Inclusive Abstraction:  
Teaching Eva Hesse in the South Bronx**

In recent years, “inclusion” has been invoked alongside politically reparative terms like “diversity” and “equity” as language that aims to amend fraught historical trauma and systemic oppression. In the humanities, educators have aimed to “include” texts written by those of varied ethnic, religious and socio-economic backgrounds so as to incorporate a range of voices into the literary canon. As scholars have noted, however, the trouble with this definition of inclusion is that it risks preserving the very divisions it purports to ameliorate; to be “included” is to be marked as Other—an outsider conspicuously brought into the fold. This paper draws from my own experience as art history and literature faculty in the Bard Early College Program in the South Bronx, where students in my American Portraiture class have ventured into an intensive study of Abstract Expressionism, finding intellectual rigor and creative kinship in the work of traditional New York School artists like Eva Hesse, Robert Rauschenberg and Jackson Pollock. Using this eleventh-grade class as a case study, my argument is that the inclusion of abstraction as a method of engaging with the world is politically reparative work, precisely because it endows students with new tools for articulating their own subjectivity.



**Vivian Shannon-Ramsey**

Assistant Professor, Bowie State University, USA

### **e: Leveling the Playing Field: Social Justice and Inclusion of International Education for Black Students**

Despite the positive outcomes of international education, Black students are still underrepresented, comprising less than six percent of U.S. students who study abroad. This disadvantage comes during a decade of an interconnected, rapidly changing world that challenges us to increase intercultural encounters daily (OECD, 2018). This lack of participation in international education has employability implications. For example, when employed, Blacks with a college or advanced degree are more likely than their white counterparts to be underemployed regarding their skill level (Williams et al.; V., 2019). A part of this underemployed status is because many companies are interested in employees with international education experience and often screen job applicants based on whether they have studied abroad (Pietro, 2019).

Employers like to see various experiences, including communication, intercultural, and leadership skills, which are commonly enhanced and developed during study abroad. Growing research finds a connection between studying abroad and the skills contributing to employment and career development in today's workforce (Sanger, 2017). There needs to be increased participation in study abroad to bridge learning opportunities across borders and improve cultural knowledge and employment skills (Shannon-Ramsey et al., 2023). This presentation seeks to share strategies for how institutions can reduce the inequality in access to study-abroad opportunities.

**Towfic Shomar**

Full Professor, University of Jordan, Jordan & Research Associate,  
CPNSS – LSE, UK

## **Mathematics and Physics**

This paper is concerned with the great influence of mathematics on theories in physics. Theories set the framework of thinking in certain directions, it forces scientists to discard certain information because it does not fit with the way these theories perceive the world, and hence a huge amount of information is lost. Now, have that information being processed and analysed, we would have been presented with a different version of events, with a different science. History of physics provides us with many examples where theories prevented scientists from advancing in certain ways. Moreover, when we take the whole scientific process as a Phenomenon to be studied, the mathematical formulation plays a major role in specifying the paths that are allowed to be advanced, hence any advancement would not be possible except from minds that had not yet been poisoned with the mathematical posits. Some of these examples are presented here. Can our understanding to such history help us in solving the current crisis in physics? A discussion of the role of String Theory in theoretical physics might help in giving an answer to such question.

**Andrzej Sokolowski**

Adjunct Professor, Lone Star College, Houston, USA

## **Constructing Wave Function Using Parametric Equations**

Transferring structural math knowledge to physics is difficult for students. While various ideas are suggested by the research, enhancing parallelism of algebraic structures used in physics to those studied in mathematics courses seems underrepresented. This presentation suggests an alternative way of introducing wave function as a set of parametric equations. Research shows that the mathematical underpinnings of the mechanical wave function are problematic for students. As seen from the math perspective, there can be several drawbacks in the algebraic form  $y(x, t) = A \cos\left(\frac{2\pi}{\lambda}x - \frac{2\pi}{T}t\right)$  that likely impede its analysis and interpretation; (a) the function  $y(x, t)$  represents a combination of a composite function  $x(t)$  and the variable  $t$ ; such function combination is rarely analyzed in precalculus and calculus courses, (b) the technique of reducing the wave function to one-variable sketchable representations  $y(x)$  and  $y(t)$  is also not practiced in mathematics courses, (c) There seems to be also a math prerequisite misalignment; in calculus one, that is, the prerequisites to take a university physics course do not cover partial derivatives required to differentiate  $y(x, t)$ . Therefore, understanding a new mathematical representation and its physical interpretation can be difficult for students. Thus, seeking math concepts that physics students are familiar with from precalculus appeared as a potent idea. During this presentation, the didactics of introducing the movement of energy modeled by two-dimensional waves and study findings on how physics students perceived the usefulness of these math tools to understand that analysis will be discussed.

**Izabela Stroe**

Associate Professor, Worcester Polytechnic Institute, USA

## **Integrating Entrepreneurial Mindset and Value Creation in Teaching Physics to Engineering Students for Innovation and Impact**

Worcester Polytechnic Institute is committed to the education and training of engineers for the needs of the 21st century by connecting science content to issues of critical local, national, and global importance. Recent survey done by Kettering University of industry employers shows that a large gap exists between what employers consider the “most essential competencies” for workforce readiness and graduates’ proficiency. For example, engineering students were competent in some key scientific and technological areas and were strong at continued learning; however, they lacked key skills, knowledge, and mindset to be successful in innovation with impact. To close the gap, we redesign the physics curriculum to integrate Entrepreneurial Mindset (EM) and Value Creation Framework (VCF) as a tool that empowers each student to connect physics topics to real-world societal problems and to innovate with impact. The integration of EM and VCF as a tool in teaching Physics courses proved to be impactful not only in the upper-level courses, but also in the large introductory physics courses. This is particularly important, as it shows that undergraduate students can learn to innovate with impact from day one in college. Therefore, engineering students better understand the critical needs of society, they are more motivated to learn and innovate, and they are overall more ready to successfully contribute to global partnerships.

**Linda Taylor**

PhD Student, Virginia State University, USA

## **The Politics of Leading: An Analysis of Trustee Decisions to Appoint Women Presidents at Historically Black Colleges and Universities from 2020-2023**

The purpose of this experimental research study is to garner systematic dynamics and governance understanding of what prohibited and subsequently advanced women's considerations to obtain a presidential appointment at historically black colleges and universities (HBCU) across the United States from 2020 through 2023; and why those appointments increased substantially during that time frame (Baskerville, 2023). Women's representation as presidents appeared dismal from 1837 through 2020 with less than fifty who served in leadership positions (Dillon, 2019).

The question of who is leading the leaders resonates as a directional consideration for researching equity, diversity, and inclusion decisions. A review of the literature revealed that university presidents are selected by governing boards, which historically have been comprised predominantly of males (Bates, 2007). Gender domination could support clarification of why women were rarely selected as presidents of HBCU institutions.

This qualitative study employed a grounded theory approach including a targeted survey with six current board of trustee members from various HBCU institutions. Additionally, case study interviews were conducted with two active HBCU female presidents and two state governors' ranking officials to evaluate patterns, trends, and insights into women's presidential appointment process experiences.

The results of this dissertation demonstrated implications of why women HBCU Presidents increased substantially with grounded theory patterns, trends, and predictions based on gender biases; underrepresentation of women trustees; and societal pressures factors.

**John Paul Tharakan**  
Professor, Howard University, USA

## **Creating the 21<sup>st</sup> Century Engineer for Sustainable Development and Social Justice**

Engineering educators bear a profound ethical responsibility as the stewards of the next generation of critical and innovative thinkers. It is imperative that we equip our engineering graduates not only to confront the monumental challenges facing humanity but to be the architects of innovative technologies, products, and processes that directly contribute to achieving sustainable development goals. This entails more than the traditional role of problem solvers; it requires a fundamental shift in the paradigm of engineering education.

The conventional approach, often characterized by chalk-and-talk lectures and limited assessment methods like problem sets and exams, must evolve to meet the demands of the 21st century. In this presentation, we endeavor to showcase tangible strategies for implementing transformative changes within engineering programs. Our goal is to guide educators in updating and upgrading curricular and programmatic approaches, ensuring that their graduates emerge as transformative thinkers and adept problem solvers, well-equipped to navigate the complex landscape of contemporary engineering challenges.

Central to this transformation is a departure from traditional teaching methods. Project-Based Learning (PBL) stands out as a pedagogical approach that immerses students in real-world, open-ended projects, fostering the development of critical thinking, collaboration, and problem-solving skills. PBL not only bridges the gap between theory and practice but also instills a sense of purpose by directly addressing real-world challenges.

Service Learning (SL) is another pivotal element that can be seamlessly integrated into engineering curricula. By engaging students in community-based projects, SL not only enriches their educational experience but also underscores the social responsibility inherent in engineering practice. These projects, ranging from sustainable energy solutions in rural communities to water treatment initiatives, not only provide practical learning experiences but also contribute to the betterment of society.

Open-ended design (OED) thinking is an essential aspect that encourages students to approach problems with creativity and flexibility. OED projects allow students to explore multiple solutions, fostering innovation and adaptability. By incorporating OED thinking,

engineering programs can cultivate a mindset that is attuned to the dynamic and evolving nature of the engineering profession.

Moreover, an integral aspect of this presentation will be an exploration of the ethical dimensions of engineering. Recognizing the profound impact of engineering projects on society, we will emphasize the importance of ethics and social justice considerations. Engineers must be cognizant of the broader implications of their work, ensuring that their solutions are not only technically sound but also ethically and socially responsible.

In conclusion, this paper seeks to be a catalyst for change in engineering education, advocating for a paradigmatic shift that aligns with the needs of the 21st century. Through the integration of PBL, SL, OED thinking, and a heightened awareness of ethics and social justice, we aim to empower engineering educators to nurture a new generation of professionals who will not merely solve problems but transform the world for the better.

**Ching-pin Tseng**

Associate Professor, National Sun Yat-sen University, Taiwan

## **Cooperation and Narrative Sharing: Building a Co-Creative Teaching and Learning Situation through Quasi-Theatrical Teamwork**

Works of theater arts are produced by associating with artists, dramaturgists, designers and technicians from various professions. Multiple layers of idea exchanging and complex processes of coordination are embedded in the mechanism of creative teamworking. The audience may not fully perceive the realistic dimension behind this creative teamwork. However, also because of the reality of co-creation, dramatic scenarios and rich artistic connotations of theatrical works can be achieved in the team. This paper argues that the generation of dramatic works and the concept of theater are closely related to everyday lives. The course of 'Introduction to Theatre Design' is set to start from shaping appropriate relationship among participants in their real lives. Students can also initiate their learning from the observation of everyday reality to discover theatrical connotations, and further to strengthen the process of narrative sharing and the establishment of cooperative relationships among participants of quasi-theatrical teamwork.

Theater arts is both a practical profession and a research discipline full of rich connotations of human civilization. Due to the classification of teaching expertise in the academy, teaching courses of theater arts often divide into practical work and theoretical knowledge. It results in that the mutually beneficial mechanism of teamworking in creating theatrical works can be difficult to motivate. Moreover, the director is used to be regarded as the most important role in theatrical education and practical world, as well as being authorized to have a dominant power in the decision-making of theatrical production. Therefore, other professional participants would become a secondary or functional role. The reasons for having these phenomena in academy, firstly, is because students may have biased cognition in the cooperative mechanism of theatrical production. Secondly, it may be caused by a premature grouping for students' professional selections and study routes, and thus a diverse identification may be shaped among various professions. Thirdly, practice-oriented students may pay less attention to theoretical knowledge, or theory-oriented students may not have enough practical experiences.

From questioning the traditional unidirectional teaching and learning method, this paper intends to explore how a co-creative team that is formed by students with varied professional ability can build up a base for



interdisciplinary understanding. By sharing narratives in the mode of co-working, this research expects that students can incubate their habits of team discussion, exchange and cooperation through telling stories to and sharing experiences with each other. It is thus possible to strengthen the potential for lateral learning from peers. The content and implementation of the course intend to break down the border of classrooms through the notion of 'city as theater', i.e., learning from the university surroundings. By associating with theatrical theories and the idea of 'learning by doing', living scenarios can be integrated with theatrical settings. Under the circumstance of co-creative teamworking, students with varied professional abilities and interests can thus build up compatible and considerate learning situations. Moreover, a co-creative and symbiotic theatrical environment can be established in the future.

**Willis Walter**

Dean, College of Education, Virginia State University, USA

**Britine Perkins**

Assistant Professor, Prairie View A&M University, USA

&

**Chevelle Hall**

Associate Professor, Virginia State University, USA

## **The Pros and Cons of Diversity, Equity, and Inclusion Positions in America**

Education is a dynamic field that requires educators to be properly trained to navigate the changing demographics and multiple needs of children in the U.S. This presentation will focus on the concept of Educational Justice and the navigation of a pluralistic society that does not always see the students they teach. In addition, how the educational landscape changes and is redefined with the tactics of addressing diversity, equity and inclusion.

**Abe Zeid**

Professor, Northeastern University, USA

## **REU Pathways: Pathways for Community College Students to Enrich their Education and Careers**

Community colleges (CCs) serve as a valuable entry point to many students. These students are characterized as adult students working full time with families, first generation, full-time employees. Or, sometimes they are students who are not sure of a field of study and do not want to commit to more expensive higher education. Many of these students are bright, highly motivated, eager to learn, and mature. CCs are typically 2-years versus typical 4-year college education. While the main mission of CCs is to train and educate the USA workforce, many students, more often than not, are interested in transferring to a 4-year college to earn higher degrees for better future. The key is to expose them to the different pathways that facilitate such transfer and navigate through the application process.

Recognizing the importance of this concept, Northeastern University has received a three-year REU (Research Experience for Undergraduates) grant from NSF to establish an REU Site. The site investigates pathways for CC students to help and encourage them to transfer to 4-year colleges. This REU site seeks to support and excite CC students to persist in their STEM education to increase the pipeline for the STEM workforce. Its vision is to provide CC students engineering skills and to excite them about engineering research. The site enables students to spend 10 summer weeks at Northeastern University to increase skills, confidence and learn firsthand about research. Each student will join a research lab, working with faculty and graduate student mentors. Also, students will be mentored after summer to further support their successful graduation and/or transfer to a 4-year institution and beyond. The research theme of the site is smart engineering with four sub-themes: AI/Machine Learning, smart infrastructure, smart materials, and smart health. In addition, each REU student will use a SparkFun kit to implement a design project of their choice. The site is guided by two of the grand challenges of the National Academy of Engineering: personalized learning and scientific discovery. The site supports a cohort of 10 CC students annually. Special emphasis is made on the recruitment of students underrepresented (URM). Unique aspects of the REU site include: a hands-on short course in engineering topics and software tools; formal mentor training including modules for mentoring URM students; daily student meetings with mentors; extensive professional development

seminars; formal research training including daily reflection journals, poster presentations and technical writing with a faculty member; and recruitment from a unique pool of highly talented URM students.

This paper discusses the details of the site, the recruitment process, the students' selection, the program activities, the research accomplishments of students, the results of the formative evaluation of the program and lessons learned so far. Finally, we discuss the adjustments made from the first-year offering based on the program evaluation of the first year.

**Yiyu Zhang**

Associated Researcher, Institute of High Energy Physics, China

**Zhengde Zhang**

Associated Researcher, Institute of High Energy Physics, China

&

**Ke Li**

Associated Researcher, Institute of High Energy Physics, China

## **LLM-Based Physics Analysis Agent at BESIII and Exploration of Future AI Scientist**

The data processing and analyzing is one of the main challenges at HEP experiments, normally one physics result can take more than 3 years to be conducted. To accelerate the physics analysis and drive new physics discovery, the rapidly developing Large Language Model (LLM) is the most promising approach, it have demonstrated astonishing capabilities in recognition and generation of text while most parts of physics analysis can be benefitted. In this talk we will discuss the construction of a dedicated intelligent agent, an AI assistant at BESIII based on LLM, the potential usage to boost hadron spectroscopy study, and the future plan towards an AI scientist.

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