2022 Capital PKAL Regional Network Meeting

STEM Instructional Innovations Necessitated by COVID-19: Evolution of Processes Post Pandemic

A Virtual Event hosted by Coppin State University & Sponsored by the National Science Foundation

March 25, 2022

SCHEDULE

8:30 - 8:40 am, *Eastern*

CONFERENCE LOGIN

8:40 - 9:10 am

INTRODUCTION AND WELCOME

- Wanda McCoy, Assistant Professor of Mathematics, Coppin State University; *2022 Capital PKAL Conference Chair*
- Leontye Lewis, Provost & Vice President of Academic Affairs, Coppin State University
- Fay Cobb Payton, Chief Program Officer, Kaptor Center; Former Program Director, Division of Computer and Network Systems, National Science Foundation

9:10 - 10:20 am

INTRODUCTION OF KEYNOTE SPEAKER

- Dondra Bailey, Assistant Professor, Coppin State University

KEYNOTE PRESENTATION: *THAT NONE SHALL PERISH*

- Kelly Mack, Vice President for Undergraduate STEM Education and Executive Director of Project Kaleidoscope at the American Association of Colleges and Universities

Q & A WITH KEYNOTE SPEAKER

- Moderator: Sean Brooks, Assistant Professor, Coppin State University

10:20 - 10:40 am

ANNOUNCEMENTS & BREAK

- Wanda McCoy, Coppin State University

10:40 am - 12:10 pm

MORNING CONCURRENT SESSIONS

TRACK A

Moderator: Sean Brooks

1. ***Where Do We Go from Here? Ask Your Students***
   Kurt Lindboom-Broberg, Pennsylvania State University, New Kensington
2. ***COVID-19 Research Resiliency: An HBCU Building Research Capacity Through Digital Spaces***
   Verleen McSween and Lawanda Cummings, University of the Virgin Islands
3. ***The Evolution of COVID-19 Induced Instructional Interventions and the Future of STEM Education***
   Atma Sahu, Coppin State University
4. ***Innovations of Course Materials in STEM Education to Inspire Students in a COVID-19 Environment***
   Rui Gong, Mercer University and Li Feng, Capital University

10:40 am - 12:10 pm CONT'D

TRACK B — Moderator: Dondra Bailey

1. ***A Whole-Student Approach to Teaching Increases Student Engagement***
   Rivka Glaser, Stevenson University
2. ***Urban Education Using Culturally Relevant Teaching (CRT)/ STEM Practices***
   Dondra Bailey and Wyletta Gamble-Lomax, Coppin State University
3. ***Recreating the Socio-Psychological Act of Teaching During Social-Distancing***
   Lily Rui Liang, University of the District of Columbia
4. ***The Radical Idea that Learning Stems from Reading and Interacting: A Framework for Social Annotation in the STEM Classroom***
   Susan Reynolds, Colorado School of Mines
5. ***Implementing Team-Based Learning Online to Promote Deep Learning and Foster Community***
   Sarah Ann Arrington, Appalachian State University

TRACK C — Moderator: Wanda McCoy

1. ***Teaching In Situ Biology Labs During a Pandemic: Challenges and Lessons Learned***
   Jenise Marie Snyder, Lynn Ulatowski, and Lita Yu, Ursuline College
2. ***The Effectiveness of Adaptive Learning in a Gateway Mathematics Course at a Private HBCU***
   Valerie Poindexter Bennett, Clark Atlanta University
3. ***Legos and Cotton Balls: Engaging Students with Protein Modeling***
   Kelsie M. Bernot, North Carolina A&T State University; Nikea C. Pittman, University of North Carolina Chapel Hill; and Kimberly M. Pigford, North Carolina A&T State University
4. ***Using Virtual Reality (VR) to Enhance Learning and Engagement in Undergraduate Biochemistry***
   Adam Brown, Columbia University

12:15 - 12:45 pm **LUNCH & PARTICIPANT PPT SHOWCASE**

12:15 - 12:45 pm **FACILITATED SESSION FOR ADJUNCT FACULTY**
Facilitator: C. Ellen Washington, C2EW Leadership Consulting

12:45 - 12:50 pm **ANNOUNCEMENTS**
- Wanda McCoy, Coppin State University

12:50 - 1:50 PM **AFTERNOON CONCURRENT SESSIONS**

TRACK A

Moderator: Mary Owens-Southall

1. ***Practical Ideas for Enhancing Access to Informal STEM Learning***
   Scott W. Bellman, University of Washington
2. ***CUREing Cancer: How a Virtual Cancer Genomics CURE Made Research Accessible to Students During COVID***
   Irene Reed, University of Saint Joseph
3. ***Expanding Access to Undergraduate Research Through BCEENET Cures Using Digitized Collections Data***
   Carly N. Jordan, The George Washington University; Cecily D. Bronson, Portland State University; and Janice L. Krumm, Widener University

TRACK B

Moderator: Dondra Bailey

1. ***Adaptation and Adoption of OER in Introductory Chemistry Courses***
   Julie Donnelly, Nicole Lapeyrouse, Matthew Rex, Tamra Legron-Rodriguez, and James Paradiso, University of Central Florida
2. ***Design and Implementation of Pre-class Assignments for General Physics I Lab***
   Guofen (Heather) Yu and Steven Wild, The University of Findlay
3. ***A Role for Remote Laboratory Kits in Increasing Student Personal Responsibility During Online Instruction***
   Christoph J. Hengartner, Ana M. Jimenez, Flona Redway, and Leticia R. Vega, Barry University

TRACK C

1. ***Course Maps to Facilitate Communication and Engagement With Students***
   Claudia Thorne, Coppin State University with student panelists: Katia Barnes, Lemonica Richardson, Ashley Williams, Terrena Williams and Tia Diggs
2. ***The CareFull Scholars Program: An Innovative Model to Promote Scholarly Work***
   Gail P. Hollowell, North Carolina Central University; Michelle C. Chatman, University of the District of Columbia; and Cheryl P. Talley, Virginia State University

1:55-2:00 pm

INTRODUCTION TO NETWORK SESSIONS

Moderator: Sean Brooks

- Mary Owens-Southall, Interim Dean, College of Arts & Science, Coppin State University

2:00 - 2:45 pm

NETWORK SESSIONS

See page 17 for breakout session information.

2:45 - 3:00 pm

CLOSING THOUGHTS

- Wanda McCoy, Coppin State University

SESSION INFORMATION

KEYNOTE PRESENTATION

That None Shall Perish

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9:10 - 10:20 AM

Dr. Kelly Mack is the Vice President for Undergraduate STEM Education and Executive Director of Project Kaleidoscope at the Association of American Colleges and Universities (AAC&U). In this capacity, Dr. Mack provides leadership for the organization's mission level commitments to quality and inclusion through the delivery of world class professional development aimed at empowering our nation's finest STEM faculty to competitively train and educate more STEM students. Prior to joining AAC&U, Dr. Mack was the Senior Program Director for the National Science Foundation ADVANCE Program while on loan from the University of Maryland Eastern Shore where, as a Professor of Biology, she taught courses in Physiology and Endocrinology for 17 years.

Dr. Mack's holistic approach to STEM reform is grounded in a strategic vision that foregrounds inclusion as an immutable factor for achieving excellence in undergraduate STEM education. Her leadership in STEM reform has led to: significant increases in the capacity of STEM faculty to implement culturally responsive pedagogies, major shifts in the ways in which leadership development for STEM faculty is delivered, and the expansion of both physical and virtual convening platforms for knowledge generation, exchange, and dissemination.

Recognized as a national thought leader in higher education, Dr. Mack's work has been highlighted in Diverse Magazine and U.S. News and World Report. Currently, she is an advisor to several institutional transformation initiatives at NSF-funded ADVANCE institutions, as well as other national STEM reform collaboratives. She is also co-founder and chair of the board of the Society of STEM Women of Color, Inc., and has served as member of numerous board and national committees.

Dr. Mack earned the BS degree in Biology from the University of Maryland Eastern Shore and, later, the PhD from Howard University in Physiology. She has had extensive training and experience in the area of cancer research with her research efforts focusing primarily on the use of novel antitumor agents in breast tumor cells, as well as the use of bioflavonoids in the regulation of estrogen receptor positive (ER+) and estrogen receptor negative (ER-) breast tumor cell proliferation. Most recently, her research efforts have examined STEM leadership development and the impact of mindfulness on STEM faculty self-efficacy.

MORNING CONCURRENT SESSIONS

10:40 AM - 12:10 PM

TRACK A-1.
Where Do We Go from Here? Ask Your Students
Kurt Lindboom-Broberg, Pennsylvania State University, New Kensington

For two years, STEM (and all forms of) education have been forced to adapt. An education system that was previously dominated by in-person instruction embraced online and remote formats overnight. Since that time, instructors and institutions have experimented with formats, software, platforms, instructional methodologies, grading approaches, and more in hopes of improving the at-home 'non-classroom' experience and outcome. As public health regulations are being lifted, there is a decision. Where do we go from here? Are flexible online classrooms here to stay? Will hybrid courses be the future? Will everyone return to in-person instruction? The answer has always been that the data is in the classroom – students will dictate the path forward. Before, during, and well after COVID, student feedback will continue to evolve the pathway that higher education will take. This talk will explore many ways that student feedback built the COVID classroom through examples in STEM course development and how it has changed every class format – remote, hybrid, and in-person – forever.

TRACK A-2.
COVID-19 Research Resiliency: An HBCU Building Research Capacity Through Digital Spaces
Verleen McSween and Lawanda Cummings, University of the Virgin Islands

The Virgin Islands Institute for STEM Education, Research, and Practice (VI-ISERP) is the STEM Workforce Development component of the Virgin Islands Established Program to Stimulate Competitive Research (VI-EPSCoR) initiative. The University of the Virgin Islands (UVI) is an HBCU and the only institution of higher education within the territory serving as a key stakeholder in workforce development within the USVI. During the COVID- 19 pandemic, university faculty have had to adapt and innovate not only in teaching practices but also in research. These innovations are critical for HBCU faculty that already experience disparities in retention, promotion, and tenure exacerbated by heavy teaching loads and limitations in research infrastructure. In order to address psychological and professional barriers to faculty success, the Mentoring and Research Infrastructure (MRI) component of VI-ISERP has created an inter and intra institutional network of support for an inclusive community of scholars, including faculty, graduate students, and undergraduate students. In collaboration with the Professional development for Emerging Education Researchers (PEER) program, funded by NSF (BCSER); MRI facilitated a 5-day hybrid intensive field school to build capacity in educational research. Using the SLACK networking tool, MRI facilitates a virtual space for informal networking between experts and early career peers, sharing grant and dissemination opportunities, and access to professional development opportunities. Birthed out of initial seed funding from Jackson State University's ADVANCE Women of Color Writing Retreat, MRI created Voices of Women in STEM (VOWS), a collaborative virtual community of female academic scholars that participate in weekly structured writing sessions.

TRACK A-3.
The Evolution of COVID-19 Induced Instructional Interventions and the Future of STEM Education
Atma Sahu, Coppin State University

The coronavirus disease 2019 (Covid-19) has disproportionally affected African Americans and other minority communities in the United States, particularly more so in Baltimore Maryland. The low-income student population was forced to support their own well-being. With students, 100% footprint policy of face-to-face classroom instruction at Coppin State University, the state of teaching and learning has begun to change. There are many questions that are evolving such as, has undergraduate education changed to better prepare students for their professions and lives? Will the undergraduate education in the new COVID-19 normal prepare all STEM students to use scientific thinking and skills in their lives and careers, regardless of race, ethnicities, and culture? In this presentation, the participants will learn what the future STEM education framework brings for the educators and STEM students, as the presenter shares findings of a symposium report on imaging the future of undergraduate STEM education developed by the National Academies of Sciences (NAS), 2022. Additionally, the presenter will share lessons learned on building an adaptive-pedagogical framework for teaching and learning, along with the NAS report overview.

TRACK A-4.
Innovations of Course Materials in STEM Education to Inspire Students in a COVID-19 Environment
Rui Gong, Mercer University and Li Feng, Capital University

In this presentation, some innovations of course materials in Mathematics and Computer Science learned from COVID-19 environment to inspire students will be discussed. The authors believe that inspiration plays an important role in STEM teaching. In order to achieve the goal of helping students to think critically and creatively, the authors apply some innovation strategies besides traditional calculation and application. During of the Covid-19 pandemic, it has been difficult to inspire students by treating each student as an individual because the amount of time used in verbal communication in and outside the class decreased significantly. To inspire students in new ways, the effective adjustments we made to our teaching mathematics and computer science include presenting material more clearly, providing students with the resources they need to become active learners and helping each student learn by meeting them at their levels in Zoom. In order to accommodate pandemic needs, the teacher's responsibility of providing the students with the resources to succeed plays a more important role than before. The authors did make notes carefully and planned out to deliver the material clearly, with more well-thought-out examples that illustrate the topics at hand. In addition, in our notes all main points and concepts were highlighted and explained by some examples instead of using abstract definitions only. Other strategies that were used during the pandemic are still used such as creating detailed weekly plan in course website which includes each week's topic, learning outcomes, needing materials and required completed assignments, using online videos as additional resources, providing online practice quizzes to help students prepare the real quiz and exam, etc.

TRACK B-1.
A Whole-Student Approach to Teaching Increases Student Engagement
Rivka Glaser, Stevenson University

The COVID-19 pandemic laid bare societal inequalities that have impacted students for years and exacerbated mental health issues for many students. The initial switch to remote learning in Spring 2020, coupled with the double stressors of living during a pandemic and many accounts of police brutality against Black Americans, negatively impacted students. Many college wellness centers reported increases in the number of students seeking services during this time. The switch back to in-person learning in Fall 2021, after a year and a half of virtual learning, presented additional difficulties. Students struggled with the demands of being back in person, time management, and engaging in real-time with their classes and peers. Our classrooms are not vacuums, and what happens in our students' daily lives impacts their ability to succeed in our classrooms. Many pedagogies focus solely on what goes on in the classroom – case studies, team-based learning and other active learning techniques all promote engagement in the classroom. However, for students to succeed in today's environment, instructors need to first understand the factors that contribute to or impede a student's overall well-being so that they can be a source of support and encouragement. This session will focus on changes instructors can do to support the whole-student, which will in turn increase engagement in the class.

TRACK B-2.
Urban Education Using Culturally Relevant Teaching (CRT)/ STEM Practices
Dondra Bailey and Wyletta Gamble-Lomax, Coppin State University

The integration of Culturally Relevant Teaching (CRT) practices in STEM education provides competency-based learning outcomes that are content-rich and relevant to the culture and learning of urban students. A collaboration between Coppin State University (CSU) faculty and community partners organized a week-long virtual Summer Institute designed to immerse early childhood and elementary teacher candidates and current teachers with content-rich STEM concepts on how to teach STEM using CRT strategies. Participants were engaged in two sessions facilitated by CSU faculty and an elementary school teacher. The sessions focused on two learning outcomes: (1) Gain an understanding of the importance of CRT principles and how to be intentional about incorporating them in the classroom and (2) Acquire knowledge in ecological concepts through virtual hands-on demonstrations using Daphnia, often referred to as the water flea, to study external factors that affect growth. This framework provided participants with tools to apply CRT principles with the STEM component. Participants prepared group presentations and were able to take away this project as an example designed to use as a specific lesson plan in the course.

TRACK B-3.
Recreating the Socio-Psychological Act of Teaching During Social-Distancing
Lily Rui Liang, University of the District of Columbia

As a social-psychological act, teaching is challenged more than ever before during social distancing caused by the COVID-19 pandemic. For the safety of faculty and students, classes moved to online platforms, and masks created challenges for recognizing and communicating with each other even after campuses reopened. According to the Center for Collegiate Mental Health, which tracks students who seek mental-health treatment on campuses nationwide, about two-thirds of students reported that COVID-19 had affected their mental health. Educators are forced to reflect on our teaching practices and create new ways of establishing relationships, trust, and communication. This presentation aims to share strategies and technologies used to recreate the socio-psychological

interactions between faculty and students at an urban commuter HBCU campus. We leverage the latest technologies and partnerships to provide our students with individual attention and community support, both inside and outside the classroom. Our 2021 Fall student surveys in two classes and one service-learning program showed that 90% of the students that responded felt connected with the faculty and others in their classes or organizations, 90% felt supported, and 100% felt engaged in their classes/program.

TRACK B-4.
The Radical Idea that Learning Stems from Reading and Interacting: A Framework for Social Annotation In The STEM Classroom
Susan Reynolds, Colorado School of Mines

In STEM courses, educators often emphasize the successful execution of close-ended computations over a broader understanding of course topics. Such an understanding can be facilitated through the use of a well-curated set of course readings that provide the context, historic examples, and modern case studies that make STEM topics so stimulating and satisfying. Modern economic, social, and cultural influences make it challenging for educators to motivate students to invest time in close reading, resulting in its underutilization in STEM courses. One technique piloted during remote teaching is social annotation: the assignment of course readings via a digital interface and the resulting interactions between students and instructor via in-line comments. Social annotation promotes inclusivity in the classroom, as students that feel uncomfortable speaking up in a classroom environment are often more at ease online. In the pilot study, students successfully completed the course readings, in part due to a thoughtful syllabus policy that communicated expectations, as well as the use of a fair grading rubric.

TRACK B-5.
Implementing Team-Based Learning Online to Promote Deep Learning and Foster Community
Sarah Ann Arrington, Appalachian State University

One of the silver linings of the pandemic was that faculty were given the opportunity to explore new instructional strategies without the pressure that it had to be perfect. As a biologist and instructional designer, this was a golden opportunity for me to redesign my 1000-level major's biology course. This workshop will show you how I transformed a typical lecture-based course to an engaging, student-centered learning environment using Team-Based LearningTM. This pedagogical approach not only increased student-led learning during class, but built a sense of community and fostered deeper learning outside of class, all being fully online. Students learned critical soft-skills like collaboration, time-management, and communication, while also learning to apply biological concepts to real-world problems. Designing a course around TBL also provided a learning environment that was accessible, inclusive and demonstrated the power of working with a diverse team. In this session participants will learn the basic tenets of TBL and how to adapt them for synchronous online instruction. We will compare how tools within an LMS, as well as a proprietary software, InteDashboardTM can be used to conduct TBL activities online, looking at both the pros and cons of both platforms. TBL will be used as part of the workshop, allowing participants to get a firsthand look at how it can be applied in their courses.

TRACK C-1.
Teaching In Situ Biology Labs During A Pandemic: Challenges and Lessons Learned
Jenise Marie Snyder, Lynn Ulatowski, and Lita Yu, Ursuline College

The pandemic posed many problems for traditional face to face instruction, and those problems were multiplied for laboratory classes. As the pandemic evolved, so did the challenges. After the abrupt shutdown during Spring break, access to the lab supplies was nearly impossible. Lab classes were completed using virtual simulations, online resources, and utilizing household supplies. In the following semesters, school policy required face to face instruction. As the pandemic has waged on, our challenges further evolved due to social distancing pressures, which required a last-minute switch to hybrid lab instruction. While no longer socially distant, absenteeism due to quarantined students is a rampant problem. As we transitioned through these stages we never failed, but have learned, progressed, and developed new skills, resources, and abilities. We share our experiences in teaching 6 different lab classes (20 sections) from biology to nursing, and non-science majors in a variety of formats, including asynchronous remote, synchronous remote, and hybridized instruction. We will share our approaches, student feedback, success and failures, and share which methods were ideal under which circumstances.

TRACK C-2.
The Effectiveness of Adaptive Learning in a Gateway Mathematics Course at a Private HBCU
Valerie Poindexter Bennett, Clark Atlanta University

The problem addressed in this study is the low pass rates of African-American students (AAS) in Pre-Calculus, a gateway Mathematics course. As a consequence of low pass rates in this gateway course, AAS are hindered in their pursuit of careers in Science, Technology, Engineering, and Mathematics (STEM), which leads to a less diverse workforce in STEM fields. The purpose of this mixed-methods study was three-fold. First, using three academic years of data, the study identified specific areas using the ALEKS adaptive learning platform the concepts and sub-topics within Pre-Calculus for which AAS has the most and least mastery. By analyzing this dissection of specific topics within Pre-Calculus for the target group, the researcher provided new insights into the reasons why there is a low pass rate of AAS in these gateway courses. Second, this study sought to determine whether there are differences in high school Math mastery of AAS by income level and region. The third purpose of this study was to determine which groups of AAS (high school mathematics mastery, income level, and region) are ALEKS most effective. Effective in this context was defined as pass rate and numeric grades obtained in Pre-Calculus. This work is significant in that it will guide practitioners as to how and to what degree adaptive learning platforms should be used in order to glean meaning from the reporting and to help AAS of all income levels. Since there is currently limited research-based evidence of the effectiveness of these types of instructional tools for AAS, this work will contribute to the body of research on this target population. The findings of this study, indicate that despite the challenges that AAS face in their pursuit of completing their STEM majors, using adaptive learning in the gateway Mathematics course can alleviate and even nullify the challenges this population of students face. In summary, these findings show that low-income students achieve better in Math contradicts much of the previous research on low-income students' achievement. The more understanding the research community can gain through robust research on practices that are most effective for AAS, the more this understanding can be applied and put into practice on a larger scale.

TRACK C-3.
Legos and Cotton Balls: Engaging Students with Protein Modeling
Kelsie M. Bernot, North Carolina A&T State University; Nikea C. Pittman, University of North Carolina Chapel Hill; and Kimberly M. Pigford, North Carolina A&T State University

The COVID-19 pandemic brought forth challenges in the equity of assessment in online or hybrid courses. Coupled with challenges in technology, device, and internet access, the priorities of both faculty and students shifted in their choices of how to spend classroom and personal time. Our introductory biology faculty similarly adjusted our approach during the pandemic to meet student needs. In accordance with best practices for increasing long-term learning as well as success, we replaced our infrequent high stakes exams with frequent low-stakes quizzes and infrequent high-stakes modeling projects. For example, one project asked students to create a 3-D model of snake venom bound to acetylcholinesterase and to compare structures of the bound and unbound protein. Additionally, students built models for 1 of 5 different proteins, enabling shared discussion and comparison among their finished models. In this session, we will discuss student achievement of learning outcomes, student perceptions of task value and self-efficacy, as well as student and faculty enjoyment of the modeling project. Finally we will discuss lessons learned and potential application to participants' own classrooms.

TRACK C-4.
Using Virtual Reality (VR) to Enhance Learning and Engagement in Undergraduate Biochemistry
Adam Brown, Columbia University

Columbia University Professor of Biological Sciences Brent Stockwell and colleagues examined the potential of virtual reality (VR) technology to improve student engagement in small group STEM course discussions by creating an immersive experience where attention is focused on challenging concepts in biochemistry. We noted that VR affords the use of realistic 3D structures to illustrate key biochemical concepts more effectively than with 2D tools in Zoom or even with textbooks and a whiteboard in discussions on campus. We therefore reasoned that holding small group discussions in VR might enhance student experience relative to being on campus or current online formats. Accordingly, we endeavored to evaluate the impact of holding weekly small group discussions on Zoom (in Fall 2020 and Summer 2021) and in-person (in Fall 2021) versus in VR on student outcomes such as performance on a novel quiz, self-reports of engagement and motivation, and perceptions of the usefulness of the technology. We hypothesized that the immersive nature of small group discussions in VR – implemented in the latest iteration via the virtual meeting app Glue on Oculus Quest 2 headsets – would enhance student outcomes as assessed by these metrics. We found that students in the VR group reported enhanced engagement relative to the control group. Students in the VR group also reported an array of positive reactions to their experience as well as a number of concerns. We are preparing for another iteration of this study by exploring ways to enhance the impact and immersiveness of VR biochemistry learning experiences.

AFTERNOON CONCURRENT SESSIONS

12:50 - 1:50 PM

TRACK A-1.
Practical Ideas for Enhancing Access to Informal STEM Learning
Scott W. Bellman, University of Washington

In the proposed session, attendees will learn about the University of Washington's (UW) Access to Informal STEM Learning (AccessISL) project, and its innovative use of graduate and undergraduate student interns to address inequities in ISL offerings. The focus of the proposed session is equitable and accessible Informal STEM Learning (ISL). ISL can play an important role in increasing the interest and knowledge of people with disabilities, but only if it is accessible to them. As increasing numbers of students with disabilities pursue STEM majors and careers, the accessibility of ISL programs is increasingly important. Session participants will learn about free practical-application-focused resources and how to use them, such as the publication Equal Access: A Checklist for Making Informal Learning Accessible to Students with Disabilities. They'll also learn about the varied activities of AccessISL student interns, and how components can be replicated in a wide variety of settings. We will also discuss how this NSF funded project responded effectively to the COVID-19 pandemic. The presenter has decades of experience leading activities at the UW Disabilities, Opportunities, Internetworking, and Technology (DO-IT) Center. Since 1992, DO-IT has worked to increase the STEM degree and career attainment of students with disabilities through a variety of projects, including national alliances called AccessSTEM and AccessComputing.

TRACK A-2.
CUREing Cancer: How a Virtual Cancer Genomics CURE Made Research Accessible to Students During COVID
Irene Reed, University of Saint Joseph

Course-based undergraduate research experiences (CUREs) provide an opportunity to engage larger numbers of students in research and provide a classroom environment to learn important skills such as generating hypotheses, collecting and analyzing data, and making informed conclusions. The ability to fully implement laboratory-based CUREs was hindered by the COVID-19 pandemic, generating a greater need for virtual options. This presentation will describe the development and implementation of a virtual cancer genomics CURE in a fully online asynchronous course, and how this project could be adapted for individual faculty-mentored research or enhance on-ground classes. The virtual format preserved important aspects of CUREs including collaboration, discovery, relevance, troubleshooting, and implementing scientific practices. Students utilized freely available online databases such as cBioPortal, COSMIC, Malacards, and PubMed to develop novel scientific questions, generate and analyze data, and make informed conclusions. Research project outcomes were communicated through various mechanisms including presentations, papers, or blog posts.

TRACK A-3.
Expanding Access to Undergraduate Research Through BCEENET CUREs Using Digitized Collections Data
Carly N. Jordan, The George Washington University; Cecily D. Bronson, Portland State University; and Janice L. Krumm, Widener University

Biological Collections in Ecology & Evolution Network (BCEENET) supports the development and implementation of Course-based Undergraduate Research Experiences (CUREs) using digitized natural history collections data. In 2020, funded by an NSF RAPID-COVID grant, BCEENET members developed four CUREs that can be implemented in a variety of course formats (in-person, online, and hybrid; synchronous and asynchronous), and in time frames ranging from 4-16 weeks. The CUREs only require computers, the internet, and open-access resources, increasing the accessibility of CURE experiences at both 2- and 4-year institutions. Benefits of the CUREs go beyond alleviating the impacts of COVID, broadly expanding access to undergraduate research in ecology and evolution. BCEENET CUREs also help students build essential skills in science communication and data literacy, including data acquisition, data management and curation, and data visualization. CUREs are especially impactful for low income, first-generation, and minority undergraduate students, as well as students unable to dedicate time to research outside their normal course load due to personal and financial barriers. Additionally, students with disabilities who are unable to participate in traditional wet lab or field experiences can participate fully in dNHC CUREs, working at their own pace and with access to assistive technology. In this session, we will introduce and summarize the four CUREs developed by the network, and demonstrate how to use the data portal iDigBio to access digitized natural history specimen records. We will also highlight the support provided by BCEENET, including complete curriculum materials, training sessions, peer mentorship, and opportunities for stipends.

TRACK B-1.
Adaptation and Adoption of OER in Introductory Chemistry Courses
Julie Donnelly, Nicole Lapeyrouse, Matthew Rex, Tamra Legron-Rodriguez, and James Paradiso, University of Central Florida

Textbook affordability was an area of focus in higher education well before the COVID-19 pandemic forced institutions across the globe to suddenly pivot to remote instruction in 2020. However, challenges associated with the accessibility and affordability of course materials were only exacerbated by this transition. In this presentation, we will discuss how the COVID-19 pandemic catalyzed the adoption of open educational resources (OER) in introductory chemistry courses at a large public institution. As part of an ongoing initiative at our institution to leverage the benefits of online and blended learning, we proposed a project with three main goals: 1) increase affordability of course materials for the entire Chemistry Fundamentals series by adapting existing OER to create our own eTextbook, 2) improve student performance and decrease DFW rates by developing adaptive homework modules, and 3) increase student engagement with course materials. We will describe the activities associated with each goal, the concerns that faculty in our department had as we embarked on this project, and how we sought to address those concerns within each activity.

TRACK B-2.
Design and Implementation of Pre-class Assignments for General Physics I Lab
Guofen (Heather) Yu and Steven Wild, The University of Findlay

The learning outcomes of our General Physics I lab course include enhancing understanding of General Physics I topics through hands-on experience and developing lab skills such as recording data appropriately, creating data tables and graphs in the formats as in professional publications, and analyzing experimental errors and uncertainty. We have a lab manual written by our faculty that has been under revision to keep the activities inside the allotted time. Still, we see many students struggle with data collection and their mental fatigue slows thinking through questions. Due to COVID-19, we were required to be prepared to move class online when necessary. This led to designing and implementing pre-lab assignments in Canvas. These assignments (readings, videos, and quiz questions) focus on preparing students for the lab with physics concepts and calculations. With the pre-lab practice, students could have more time and better focus to think through experimental questions. Feedback from students was very positive about our online pre-lab assignments.

TRACK B-3.
A Role for Remote Laboratory Kits in Increasing Student Personal Responsibility During Online Instruction
Christoph J. Hengartner, Ana M. Jimenez, Flona Redway, and Leticia R. Vega, Barry University

As a primarily undergraduate MSI, Barry University focuses on in-person teaching and mentoring. The biology department has a goal to move from “cookbook labs” to inquiry-based experiments that integrate biological concepts. COVID-19 forced delivery of online synchronous “hybrid” laboratories, thus all students were supplied with remote lab kits. We initially felt this was a backward step away from inquiry-based learning, but our thinking has evolved. Remote students reported having “a greater sense of responsibility” by performing independent, remote lab activities, compared to pre-COVID-19 in-person lab groups with four or more students. Limitations in workspace and lab kit supplies resulted in the need for students to share results with each other prior to online discussion and analysis, providing unique opportunities for shared inquiry-based learning. Surprisingly, students recorded more quantitative data and experienced focused presentation of concepts with the remote modality. They also learned how to problem-solve rather than simply following instructions with prepared laboratories. As we consider the design of inquiry-based, in-person labs, our experience with remote delivery highlights the benefits of independent, hands-on inquiry, shared preparation, independent data collection, error discussion and shared quantitative data. Our collective understanding has evolved to incorporate personal responsibility and individual hands-on experiences into the curriculum for inquiry-based labs.

TRACK C-1.
Course Maps to Facilitate Communication and Engagement With Students
Claudia Thorne, Coppin State University with student panelists: Katia Barnes, Lemonica Richardson, Ashley Williams, Terrena Williams and Tia Diggs

The COVID 19 pandemic presented an opportunity for faculty to adapt classroom management strategies in online and hybrid teaching modalities. Creating and distributing a course map has been an effective strategy in enhancing faculty and student communication in a rapidly changing environment. The course map outlines in detail the learning objectives, learning activities, learning materials and assessment, assignments, and due dates for a 7- or 15-week semester. The course map provides students with clear expectations, which has facilitated student engagement and completion of assignments and activities during the pandemic.

TRACK C-2.

The CareFull Scholars Program: An Innovative Model to Promote Scholarly Work

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We all know our teaching, research, and scholarly productivity has been greatly impacted in a myriad of ways due to COVID-19. Some examples include: faculty and student engagement, students' involvement in experiential opportunities, and our writing scholarship. The demands of our current times have compelled us to re-examine how we relate to ourselves, our families, our work, and each other. In an attempt to assess the impact of COVID-19 on the scholarship of faculty during Year 1 of the pandemic, March 2020 through February 2021, the HBCU STEM-US Analytic Research Hub (www.hbcustemhub.org) a community of faculty scholars dedicated to producing artifacts around STEM Education scholarship, engaged a faculty cohort in the Tier-Two Faculty Fellows CareFull Scholars Program as a pilot intervention for HBCU, MSI & other faculty. In general, the Tier-Two Faculty Fellows Program assists participants to transform research ideas into publication submissions while at the same time prioritizing self-care. Two virtual sessions introducing this innovative holistic writing approach were held in January 2022. During these sessions, the CareFull Scholars Program which focuses on a manageable regular writing routine integrated with contemplative practices was introduced. There was also a space created for reflection, imagination, and sharing the ways to support the scholarly publication goals. The CareFull Scholars Program model which is a generative and collaborative four-pronged approach was explained to the potential participants and they were invited to join the initial cohort of the CareFull Scholars Program. During this session the program components and preliminary data will be shared.

NETWORK BREAKOUT GROUPS

We received many research interests. In every effort, we have tried to provide groups for shared interest based on the themes of the conference. Additional disciplinary groups have been added.

BREAKOUT ROOM A The evolution of COVID-19 induced online platforms for instructional and research innovations to the face-to-face platform Online education/course material Lab education Expanding on high impact practices Innovative course material Asynchronous environment Problem-based learning in a virtual environment Academic course map Inclusive course Fostering deep learning in online courses	**BREAKOUT ROOM B** The impact of COVID-19 on mental health and classroom engagement Inclusive teaching practices Culturally responsive teaching Student engagement Student development using case studies Self-efficacy
BREAKOUT ROOM C Establishing and maintaining equity and inclusion in a COVID-19 environment Diversity and equity Biases in recruiting and retention of students Women of color in STEM Accessibility for individuals with disabilities Child welfare	**BREAKOUT ROOM D** COVID-19 factors that now shape potential policy Changes STEM Policy Makers Assessment research STEM retention at HBCUs Mentoring and Building research capacity Improving undergraduate research Retention and recruiting
BREAKOUT ROOM E Lessons learned on effective STEM instructions Active learning STEM undergraduate research Undergraduate research experience Recitation Pedagogy	**BREAKOUT ROOM F** Disciplinary Group Data Science Bioinformatics Robotics Cloud and Blockchain technology Securing computer technology Machine learning Database and programming Computer science
BREAKOUT ROOM G Disciplinary Group Life Sciences Microbiology Biology Ecology Cell Biology Genetics	**BREAKOUT ROOM H** Disciplinary Group Mathematics/Chemistry Chemistry Mathematics
BREAKOUT ROOM I Disciplinary Group Molecular Biology Cancer Research Bioengineering Neuroscience	**BREAKOUT ROOM J** Disciplinary Group Environmental Science Marine Biology Environmental Science Geology