2nd Annual RGV STEM Education Conference

Challenging the Assumptions: Toward Transformative Practices in STEM Education

Casa de Palmas Hotel - McAllen, Texas - February 8 - 9, 2019

UTRGV STEM Education Consortium

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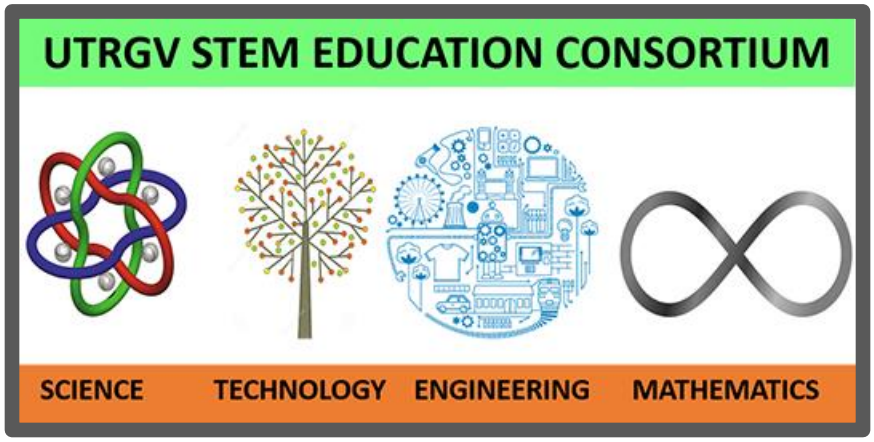
February 7-9 2019
Challenging our Assumptions:
Towards Transformative
Practices in STEM Education



UTRGV STEM Education Consortium Steering Committee
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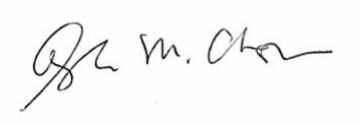
Dear Colleagues;
The College of Education and P-16 Integration and the University of Texas Rio Grande Valley welcome you to the 2019 RGV STEM Education conference, *Challenging our Assumptions: Towards Transformative Practices in STEM Education*. This year's mission is to build on the foundation laid at the inaugural conference and create a purposeful environment that brings together *EVERYONE* involved in P-16 STEM education, including higher education faculty, P-12 educators and administrators, informal educators, and students. We will continue pushing the frontiers of STEM education toward transformation of best practices, research, and policy by challenging our assumptions about what students know and can do in STEM. Through critical dialogue and reflection, this conference is positioned to be an unparalleled experience that pushes what we think about STEM education practices.

A fundamental goal of this conference is ensuring that all STEM educators are prepared to successfully implement best practices in STEM education, from preschool to college, for ALL students. And to do so with a heightened awareness of existing systemic inequities, hegemonic ideologies, and how we as educators impact student engagement, interest, and academic achievement. Conference participants are the "doers", with a willingness to be introspective and have dialogue around difficult conversations about what works as well as what doesn't work and how to transform that into success for STEM learners.

The RGV STEM Education Consortium invites P-16 STEM practitioners, scholars of all disciplines, administrators and students to attend this innovative conference. Collectively (scholars, educators, and students) we will explore how contextual factors including implicit bias, microaggressions, and stereotype threat, play out in STEM classrooms. There will be opportunities for practitioners to learn how to implement project-based learning, and for all to engage in roundtable discussions about what we need to do for students, from "cradle to college", to be successful in STEM. Conference attendees can expect to see assumptions and biases exposed, discussions around what it means to do culturally relevant teaching, as well as professional development opportunities for STEM educators.

Through this one-of-a-kind conference experience, you will join a growing movement of national and international group of STEM education pioneers that are not only committed to social justice, but are ready to act. Critically examining our own biases and assumptions will transform how we ensure student learning. In turn, you will leave this conference with tools to help your students, positioning them to be successful in their learning.

Sincerely,



Angela M. Chapman
Assistant Professor of Science Education
Greater Texas Faculty Fellow & Conference Organizer

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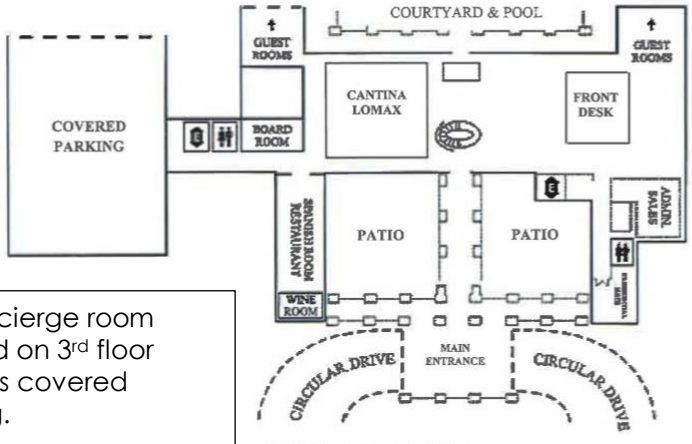
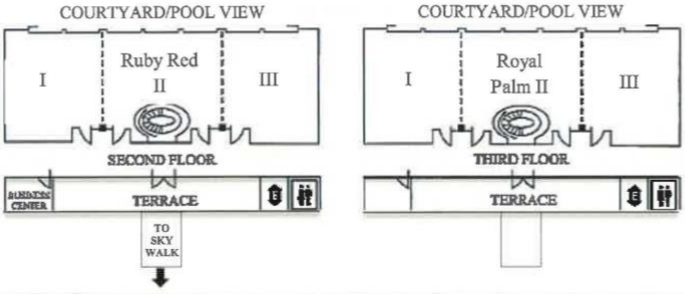
CASA DE PALMAS RENAISSANCE

PUBLIC SPACE OVERVIEW



* - Concierge room located on 3rd floor towards covered parking.

FUNCTION OVERVIEW

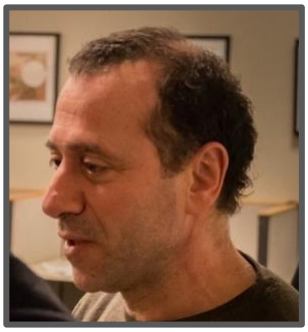


About our Speakers

Dr. Kenneth Tobin, Presidential Professor, The Graduate Center of the City University of New York

In 1964, Kenneth Tobin began teaching high school science and mathematics in rural Western Australia. He continued as a teacher and curriculum developer for a decade, after which he became a teacher educator at Graylands Teachers College, later to become part of Edith Cowan University. In Australia, Tobin has had faculty appointments at the Western Australian Institute of Technology (now Curtin University) and has been an adjunct professor at Queensland University of Technology, and Murdoch University. Tobin came to the United States in 1987 and was a tenured professor at Florida State University (10 years), University of Pennsylvania (6 years), and the Graduate Center of the City University of New York (15 years), where he is presently Presidential Professor of Urban Education. Since 1973, Tobin has been involved in research on teaching, learning, and learning to teach science. His present research focus is on mindfulness, emotion, wellness, and sustainability. His emphasis is on educating the public, birth through death, emphasizing literacy for sustainable and happy/healthy lifestyles. Specifically, his ongoing research focuses on breathing while talking.

Since 1973, when Tobin published his first journal article, he has published 210 refereed journal articles, 29 books, and 140 book chapters. Tobin's Google Scholar Citations lists 16,634 citations and an h-index of 67. Tobin's 2017/18 publications include five co-edited books, one with Stephen Ritchie (*Eventful learning: Learning emotions*); two with Lynn Bryan on critical issues for science education and reframing research in science education; and two with Malgorzata Powietrzynska, both concerning mindfulness and wellness. In similar vein, Tobin was guest editor of a special issue of *Learning: Research and Practice* on Mindfulness in education. He has also published 3 journal articles and 6 book chapters in 2017/18.

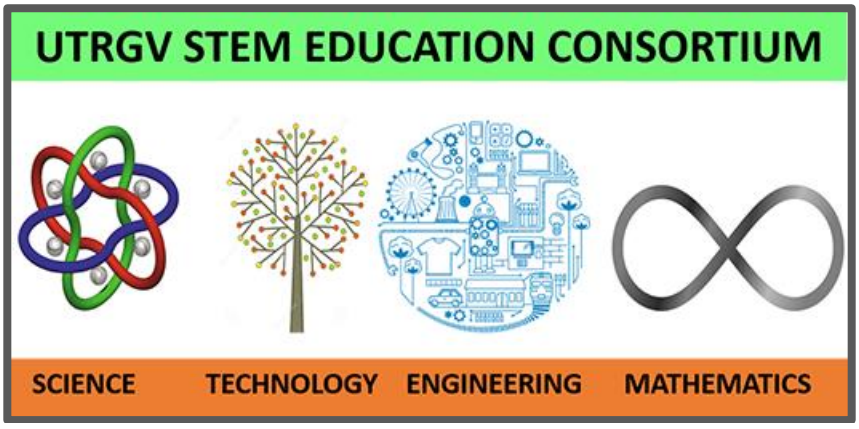


Dr. Konstantinos Alexakos, Professor and program coordinator for Adolescence Science Education at the School of Education, Brooklyn College, CUNY. His research focuses on teacher research, emotions, mindfulness, and critical social issues such as race, gender, and sexuality with the goals of improving learning, teaching and personal wellness, as well as creating spaces for discussing

challenging topics, valuing difference, and learning from each other.

Dr. S. Lizette Ramos de Robles, Professor of Biology and Environmental Health Sciences at the Universidad de Guadalajara, Mexico. Her research focuses on sociological and cultural aspects of discourse in the teaching and learning of science, especially in multilingual contexts. To understand scientific literacy more deeply, she uses sociocultural and sociolinguistic perspectives. In addition, her research also focuses on socio-environmental aspects related to Environmental Health, specifically climate change literacy.

Dr. Alejandro J. Gallard Martinez, Professor and Goizueta distinguished Chair in the Middle and Secondary Department and the Director of the Georgia Center for Educational Renewal at Georgia Southern University. Alejandro's interests include researching societal complexities promulgated by contextual mitigating factors (CMFs) that contribute to students' lack of success (or success) in general and in the STEM fields. His frameworks include global perspectives on differences, otherness, polyphony of voices and meaning making that reflects categories used to situate people in social life. His current research efforts include working with an international team to understand the characteristics of Latinas who are successful in STEM fields.



Conference Overview

Thursday, February 7, 2019

4:00 pm – 8:00 pm	Preconference meetings

Friday, February 8, 2019

7:30 am – 4:00 pm	Check-in and onsite registration
8:00 am – 8:20 am	Introductions and welcome remarks, Dr. Parwinder Grewal, Executive Vice President for Research
8:20 am – 9:20 am	Opening Keynote Address, Dr. Kenneth Tobin, Introduced by Dr. Alma Rodriguez, Dean for the College of Education and P-16 Integration
9:40 am – 11:10 am	Concurrent Session 1
11:30 am – 1:00 pm	Lunch Plenary Session, Dr. Konstantinos Alexakos
1:30 pm – 3:00 pm	Concurrent Session 2
3:00 pm – 4:00 pm	Concurrent Session 3
4:00 pm – 5:30 pm	Concurrent Session 4

Saturday, February 9, 2019

7:30 am – 12:00 pm	Check-in and onsite registration
8:00 am – 9:30 am	Concurrent Session 5
9:30 am – 11:00 am	Concurrent Session 6
11:00 am – 12:30 pm	Lunch Plenary Session, Dr. Ramos de Robles
12:30 pm – 2:00 pm	Concurrent Session 7
2:00 pm – 3:15 pm	Closing Keynote Address, Dr. Alejandro Gallard
3:00 pm – 3:15 pm	Closing remarks, recognitions, Dr. Patricia Alvarez McHatton

Opening Keynote Address

8:20 am – 9:20 am

Dr. Kenneth Tobin **Royal Palm I, II, & III**

The roles of contemplative practices in harmonizing sustainable lifestyles and educating citizens on a pre-birth through death continuum

Professor Tobin will begin with a review of our research on meditation, mindfulness, expressed emotions, and physiological variability while teaching. He will conclude with two interventions, a breathing heuristic and a meditation activity that incorporates nasal breathing and humming during the outbreath, as examples of authentic inquiry addressing how to transform lifestyles based on what we learn from ongoing research.

Concurrent Session 1

9:40 AM – 11:10 AM

Session Title	Location
1A Curriculum in STEM (Research) **STEM Transformation Means STEM Translations – Challenging STEM Language** *With STEM, to know it is to do it. Whether it is mixing chemicals or modeling an exponential function, communication through the appropriate technical language is essential. The presenters will expand on a 4-part approach to including technical language acquisition and retention (T-LAR) into STEM classrooms.* Elizabeth Casey, Selina V. Mireles, Lorraine Spickerman, University of Texas Permian Basin **Leveraging Cultural and Linguistic Capital to Learn Academic Vocabulary in Math and Science** *Acquisition of academic vocabulary in math and science is critical for students to develop literacy and content mastery. This study presents findings from a study that developed, implemented, and tested multiple vocabulary strategies (MVS) in math and science, including students whose first language is Spanish.* Angela Chapman, Stephany Pinales, Anthony Bailey, Shania Pintor, Alicia Cronkhite, University of Texas Rio Grande Valley **ESCOLAR Techbook: A Digital Gateway to Science Exploration for Diverse Learners** *When you were a student, did you ever wish your textbook would come to life? ESCOLAR has granted that wish! Our Techbooks are digital gateways into science exploration that increases the opportunities for all middle school students, especially those with learning disabilities to excel within the science curriculum through the use of Collaborative Online Learning (COL) units. Each COL unit incorporates multimodal, multimedia features, including electronic-text support (eText supports), to assist with academic reading of science content. Students are able to explore science, collaborate with others online, solve problems, creatively and enhance learning and all they are wanting is for you to explore!* Leslie Garrido, San Benito CISD Alejandro Gallard, Georgia Southern University	Ruby Red I
1B Diversity, Equity, and Inclusion in STEM (Research) **The Process of Becoming: Identity Challenges for African- American Female Science and Mathematics Preservice Teachers** *African-American female STEM majors participated in a qualitative research study to share their experiences with choice of major, racism, and sexism, and STEM compatibility. The results showed these females were undeterred by their underrepresentation, confident in their abilities, and expressed a wide variation in their experiences of identity development.* David Sparks, University of Texas Arlington **Promoting Project and Place-based Professional Learning in High Need Schools** *The VSTEM Leadership Institute is a K-12 professional learning program that seeks to engage teachers in authentic scientific inquiry and research-based teaching practices. This study seeks to examine the overall development and philosophy of VSTEM with specific focus on touchstone implementation by participating teachers.* Regina Toolin, University of Vermont	Ruby Red II

Implementing and Assessing STEM Residential Learning Communities as a Retention & Academic Success Strategy *To improve Science, Technology, Engineering, and Mathematics (STEM) graduation numbers, in 2010 the National Science Foundation (NSF) awarded St. Edward's University a STEM Talent Expansion Program (STEP) grant to establish a STEM residential learning community (RLC). Several high impact practices formed the essential elements of the community building project, including a pre-college bridge program, a first-year seminar class and cohort scheduling in the fall, community-building programming during the first year, and a science seminar class focused on undergraduate research opportunities in the spring, followed by summer research experiences for interested participants. This project was expanded in 2015 to transform the STEM curriculum to feature active learning pedagogies and scale-up the RLC model developed with the STEP grant to encompass more first-time freshman STEM majors using three different RLC models: the original STEP grant model, an "embedded" STEM RLK model, and a special Honors program format.* Richard Kopec, St. Edward's University	
1C Panel Discussion (Practitioner) **Promoting P-12 Student Success in STEM** *A panel of local P-12 administrators will share their insights on preparing students to be successful in STEM, the challenges faced by today's STEM teacher, and what they are looking for in today's STEM teacher.* Discussants: Petra Torres, Principal Rosa E. del Castillo Elementary School, Brownsville ISD Teri Alarcon, Area Assistant Superintendent of High Schools, Brownsville ISD Jeanette Nino, Secondary Science Coordinator, McAllen ISD Santos Palomo, T STEM Academy Director, La Joya ISD Cesar A. Garcia, CTE Director, Vanguard Academy	Ruby Red III
1D STEM Practitioner Workshops **Creating Enriching STEAM Learning Experiences for Young Children** *The foundation for STEAM learning, which integrates the arts into STEM: science, technology, engineering, and mathematics, begins in early childhood. This session will provide an understanding of how young children are naturally curious about their environment and how their daily interactions help them make sense of the world. It will also demonstrate how early childhood educators can excite children's natural interest, encourage many questions, and promote active inquiry. Participants of this session will actively engage in hands-on experiences that enhance and extend young children's understanding of STEAM concepts.* Irasema Gonzalez, Hilda Medrano, University of Texas Rio Grande Valley Target audience: Early Childhood and Elementary Educators	Wine Room
1E STEM Teacher Practices (Research and practitioner) **Agency and Identity of Science and Math Teachers in the Borderlands** *A community autoethnography was used to for math and science teacher candidates to explore the role that gender, race, ethnicity, immigration status, and language played in their learning in STEM classrooms and decision to pursue a STEM degree.* Ariana Garza-Garcia*, Felicia Rodriguez+, Juanita Rojas*, Eva Rojas-Fernandez*, Angela Chapman^, *McAllen ISD, +PSJA ISD, ^University of Texas Rio Grande Valley	Royal Palm I

The Hidden Curriculum Experience by Mexican American Students in Science Education *Hispanic students are being exposed to a hidden curriculum that must be illuminated because it stigmatizes low socio-economic populations. Science educators need to be aware of the hidden curriculum and diminish its' effects through a teaching approach such as culturally relevant pedagogy which utilizes funds of knowledge for promoting success.* Nora Luna, University of Texas Rio Grande Valley **The Thrill of Teaching 5th Grade Science Without the Drill in a School at the *Fronteras*** *5 years of successfully teaching 5th Grade science is examined through the process of collaborative autoethnography of a 5th grade science teacher and a university professor. The intersectionality of race, language, location, high stake testing, and science learning are scrutinized through rigorous examination of personal experience. 5 years of reflective practice that has resulted in a deeper understanding of personal classroom practice, student needs, motivation and agency, and a marked increase in passing rates in state mandated tests*. Vejoya Viren, University of Texas Rio Grande Valley Ana Sosa, Brownsville ISD **Achieving Teacher Agency in a Texas Mathematics and Science Classroom in the Age of Accountability** *This longitudinal study presented from the teacher's perspective, uniquely designed to investigate a teacher's journey on the path to teacher agency. This study illustrates the possibilities in the collaborative work where the teacher's voice is central to the study of a teacher's life. The purpose of this research is to share key elements that contributed to one teacher's ability to engage in agentic acts for the benefit of her students' overall learning and development in a mathematics and science classroom, and to illustrate the collaborative process as a viable method of placing the teacher's voice at the center of research on teachers' lives.* Lileana Rios-Ledezma, Texas A&M University and Bryan ISD	
1F STEM Practitioner Workshops **Teaching and Learning Through STEM Activities and Student Organization** *This practical presentation enables teachers to explore new ideas and learn how to integrate STEM education and Student Organizations in the classroom and after school programs. Learn how Vanguard Academy has incorporated FIRST Robotics and Cyber Security, HESTEC Sea Perch and Electrical Car Challenge, SkillsUSA and Hackathon Challenges making them relevant, intentional, and engaging.* Rogelio Gonzalez, Gerardo Flores, Belinda Guzman Vanguard Academy	Concierge

Lunch Plenary

11:30 AM –1:00 PM Royal Palm I, II, & III

Dr. Konstantinos Alexakos,

Doing Authentic Inquiry Research as a Teacher | Researcher

Concurrent Session 2

1:30 – 3:00 PM

Session Title	Location
2A Building Capacity: Improving Undergraduate STEM Education at HSIs (Research) **Advancing Student Success in Undergraduate Engineering and Computer Science** Sudarshan Kurwadkar, California State University-Fullerton **Transforming STEM Education Through Culturally Relevant Pedagogy and Community Engagement** Juan Salinas, Alexis Racelis, Angela Chapman, University of Texas Rio Grande Valley **CURE-ing microbes on ocean plastic – an undergraduate research framework to increase student engagement and retention** Ana Barral, National University **Building Capacity: Positive Learning Opportunities and Research Experiences to Promote Success in STEM** Bindhu Alappat, Saint Xavier University	Ruby Red I
2B STEM Practitioner Workshops **Hands Free Inquiry** *Don't have the time, energy or resources to do hands-on labs, activities or manipulatives? No problem! Learn how to make any lesson engaging and inquiry-based with nothing more than a pencil and piece of paper.* Elizabeth Goldberg, University of Texas Rio Grande Valley Target audience: secondary math and science teachers	Ruby Red II
2C Roundtable Discussion (Practitioner & Research) **Physics** *How are we preparing RGV students for success in STEM? This is the overarching question that will guide specific discussions with respect to student learning in physics. This group will be multidisciplinary (physics faculty, science education faculty, early child, elementary, middle school, high school, special educator, and bilingual educator) and will discuss successes and challenges faced in the classroom from preschool through college. The objective is to explore the standards, assessments, curricula, and classroom environment that prepare students for success at the next grade level.* Moderator: Janine Schall,	Ruby Red III
2D Roundtable Discussion (Practitioner & Research) **Biology** *How are we preparing RGV students for success in STEM? This is the overarching question that will guide specific discussions with respect to student learning in biology. This group will be multidisciplinary (biology faculty, science education faculty, early child, elementary, middle school, high school, special educator, and bilingual educator) and will discuss successes and challenges faced in the classroom from preschool through college. The objective is to explore the standards, assessments, curricula, and classroom environment that prepare students for success at the next grade level.*	Royal Palm I

Moderator: Miryam Espinosa-Dulanto	
2E Roundtable Discussion: (Practitioner & Research) **Nature of Science** *How are we preparing RGV students for success in STEM? This is the overarching question that will guide specific discussions with respect to student learning how students learn science. This group will be multidisciplinary (biology faculty, science education faculty, early child, elementary, middle school, high school, special educator, and bilingual educator) and will discuss successes and challenges faced in the classroom from preschool through college. The objective is to explore the standards, assessments, curricula, and classroom environment that prepare students for success at the next grade level.* Moderator: Cynthia Galvan	Concierge
2F Research **Practice Planning an Evaluation for Grant Proposals in STEM Education** *This session introduces what it means to evaluate a program in STEM education and teaches tools for planning one. It will distinguish research and discuss key concepts of the discipline. Participants will draft a program logic model, a theory of change, and consider evaluation questions and appropriate evidence.* Presenter: Michelle Burd, Burd's Eye View	Wine Room

Concurrent Session 3

3:00 PM – 4:00 PM

Session Title	Location
3A Poster Session STEM education research presentations by undergraduates, graduate students, educators, and faculty.	Ruby Red 1 & II
3B STEM Teacher Practices **Electrical and Computer Engineering E-Learning Labs for Secondary Students** *The hands-on workshop is for secondary school teachers with interests in introducing an emerging and exciting engineering topic to their students. With the latest technology developed by the author and his collaborators, digital logic design is within reach of grade-students through a few clicks of buttons on the web and the resulting circuits will work within minutes. Comparison with traditional educational methods highlights the effectiveness and potential impacts of the new method.* Junfei Li, Department of Electrical Engineering, University of Texas Rio Grande Valley	Ruby Red III
3C STEM Teacher Practices (Practitioner) **Technology Integration in the Classroom** *The exponential acceleration of technology makes it impractical and expensive for schools to purchase equipment and training for educators since most becomes obsolete within months. This workshop is designed for the educator to be build a "digital toolkit" of programs and resources to use in the classroom. The educator will be trained on how to ease the daunting*	Royal Palm I

task of searching for these tools online. Furthermore, we will discuss and act out various problematic scenarios that technology integration in the classroom usually cause. Educators are invited to BYOD (bring your own device), the more the better. MacBooks and iPads will be available for those who don't have a device. Mario Alberto Lopez, CodeRGV	
3D STEM Competition	Royal Palm II & III
3E Diversity, Equity and Inclusion **Latinx Students' Mathematics Anxiety and their Study Habits: Exploring their Relationship at the Postsecondary Level** *Increasing Latinx students' success in college-level mathematics calls for exploration on their mathematics anxiety as it relates to study habits. Using a sample of Latinx students in a Hispanic Serving Institution and their levels of mathematics anxiety, pair-wise analyses revealed significant differences among sub-groups. Moreover, regression analyses showed Latinx students' study habits being predictive of mathematics anxiety. As a result, partnerships between academic units and faculty are being forged to address these concerns.* Luis Fernandez, Xiaohui Wang Ph.D., Olga Ramirez Ph.D., Cristina Villalobos Ph.D. **Math anxiety: Causes, gender and Implications for teachers** *Math anxiety is an important factor that hinder student achievement in this subject. The presenter intends to discuss factors that contribute to math anxiety, he will also discuss how math anxiety can impact student academic success. Moreover, there will be a discussion examining which gender, male or female, have experienced higher math anxiety.* Hossein Shirvani, University of Texas Rio Grande Valley	Wine Room

Concurrent Session 4
4:00 PM – 5:30 PM

Session Title	Location
4A/B Diversity, Equity, and Inclusion in STEM (Practitioner & Research) **Implicit Bias and Microaggressions in STEM Classrooms** *How can our age, race, sex and other characteristics influence the way we see and treat others even when we are genuinely trying to be objective and unbiased? What tangible steps can we take to help prevent this from happening? This workshop introduces the concepts of implicit bias and microaggressions. Through a mix of short presentations, lively activities, and discussions, we will constructively explore how our brains naturally perceive, categorize, and draw inferences about the world, including other people. And we will discuss steps we can take to recognize our own biases and mitigate biases in our classroom.* Gerardo Aponte-Martinez, Ariana Garza-Garcia, Felicia Rodriguez, Juanita Rojas, Eva Rojas-Hernandez, Anthony Bailey, Johanna Esparza, Luis Castillo, Eunice Lerma	Ruby Red I & Ruby Red II
4C Roundtable Discussion (Practitioner & Research) **Chemistry**	Ruby Red III

How are we preparing RGV students for success in STEM? This is the overarching question that will guide specific discussions with respect to student learning in chemistry. This group will be multidisciplinary (chemistry faculty, science education faculty, early child, elementary, middle school, high school, special educator, and bilingual educator) and will discuss successes and challenges faced in the classroom from preschool through college. The objective is to explore the standards, assessments, curricula, and classroom environment that prepare students for success at the next grade level. Moderator: Janine Schall	
4D Roundtable Discussion (Practitioner & Research) **Mathematics** *How are we preparing RGV students for success in STEM? This is the overarching question that will guide specific discussions with respect to student learning in math. This group will be multidisciplinary (mathematics faculty, math education faculty, early child, elementary, middle school, high school, special educator, and bilingual educator) and will discuss successes and challenges faced in the classroom from preschool through college. The objective is to explore the standards, assessments, curricula, and classroom environment that prepare students for success at the next grade level.* Moderator: Miryam Espinosa-Dulanto	Royal Palm I
4E Roundtable Discussion (Practitioner & Research) **Engineering** *How are we preparing RGV students for success in STEM? This is the overarching question that will guide specific discussions with respect to student learn engineering principles and practices. This group will be multidisciplinary (engineering faculty, math education faculty, early child, elementary, middle school, high school, special educator, and bilingual educator) and will discuss successes and challenges faced in the classroom from preschool through college. The objective is to explore the standards, assessments, curricula, and classroom environment that prepare students for success at the next grade level.* Moderator: Cynthia Galvan	Concierge
4F STEM Teacher Practices **Promoting Understanding of Elements of Nature of Science** *Developing a proper view of nature of science (NOS) among teachers and as a result among students have been the goal of science education for decades. The activity (analogy) is introduced in this paper, covers several aspects of NOS including but not limited to the role of background knowledge, creativity, chance, framework changing, the scientific community, and tentativeness nature of science. The activity can be used decontextualized in science classes. In addition, one cultural relevant science activity will introduce in the workshop.* Noushin Nouri, Gene Frady, University of Texas Rio Grande Valley	Wine Room

Saturday, February 9, 2018

Concurrent Session 5

8:00 AM – 9:30 AM

Session Title	Location
5A Diversity, Equity, and Inclusion in STEM (Research) **Preservice Teachers and Science Teacher Efficacy** *Science teaching literacy was introduced to pre-service teachers as discussion forum and their feedback were collected as reflective responses. The participants' descriptive responses highlighted the importance of science teaching efficacy. The students were introduced to selected science topics as part of their life science, physical science, and earth, and space science domain activities. Group discussions along with hands-on activities were administered to educate pre-service teachers on some selected science topics. These topics were specific to elementary science teaching in alignment with TEKS and NGSS.* Mamta Singh, Lamar University **Nothing is Impossible: Developing Persistence in Hispanic Females in STEM** *Factors that influence the underrepresentation of females in STEM careers begins early in childhood when gender biases and stereotypes emerge. This study investigated the effect of a STEM summer camp on K-12 students. Our High school girls were less likely to participate in the STEM summer camp. We refer to the females that continue to show interest in STEM the persisters. In middle school, females reported significantly higher learning gains than males. In high school, females reported significantly lower pre-test scores than males. The implications of these findings are discussed in more detail.* #Erica Hinojosa, ^Nina Olvera, +Yakeline Tijerina, * Elizabeth Lozano, ^Angela Chapman, ^Carmen Pena, ^Constantine Tarawneh, ^University of Texas Rio Grande Valley, +Edinburg ISD, * IDEA Schools, #Donna ISD	Royal Palm I
5B STEM Panel Discussion *An opportunity for students and teachers to ask the STEM professionals about their journey toward a STEM career and what they did as a K-12 student that prepared them for success in STEM.* Discussants: Juan Palacios, M.D. Doctors Hospital at Renaissance, Constantine Tarawneh, Ph.D., UTRGV Associate Dean, College of Engineering and Computer Sciences Nina Olvera, UTRGV School of Medicine Sara Reyna, UTRGV School of Medicine	Ruby Red II
5C Diversity, Equity, and Inclusion (Research & Practitioner) **Digital Literacies in the STEM Classroom** *Reaching and Teaching Children in Poverty with Technology* *Research of low-income Latinx using technology. A discussion on primary, secondary, and tertiary digital divides. Hands-on activities for technology use at school and home.* Kathy Bussert-Webb, Karin Lewis, Carmen Garcia, University of Texas Rio Grande Valley	Ruby Red III
5D STEM Practitioner Workshop **DNA Extraction + What is Pi?** Immerse yourself in two hands-on activities in biology and mathematics! Get your hands dirty extracting a strawberry's DNA and learning about the wonderous number π. Johana De La Cruz, Jennifer Guajardo, Cinthia Martinez, Anthony Bailey University of Texas Rio Grande Valley	Concierge
5E STEM Practitioner Workshop	Wine Room

Exploring MagLev and Robotics through Railway Safety K-12 lesson plans for MagLev train systems and LEGO® MINDSTORMS® Education EV3 robots which can be implemented in formal and informal learning environments. The lesson plans can be easily incorporated into the curriculum of STEM classrooms, homeschool lessons, or as individual activities in STEM or after school programs. The developed curricula objectives have been aligned with the National and Texas State educational standards to ensure delivery of learning outcomes across the country. Terri Ochoa, La Joya ISD, Anakaren Suarez, University of Texas Rio Grande Valley	
5F STEM Practitioner Workshop **Providing Access to STEM Pathways with Assistive Technologies** *Students with a variety of disabilities traditionally have been left behind in STEM fields. As assistive technologies have become more accessible and strategic, access to STEM curricula and ultimately STEM fields have increased. This presentation will describe how instruction is differentiated via assistive technology to increase STEM access for students with disabilities.* Steve Chamberlain, University of Texas Rio Grande Valley	Ruby Red I

Concurrent Session 6
9:30 AM – 11:00 AM

6A Panel Discussion **High School Student Ambassadors** *High school student ambassadors from La Joya ISD and Vanguard Academy will discuss their experiences in the JSTEM Summer Program and STEM classrooms.* Discussants: Sebastian Acosta, Sergio Acosta, Brisa Barrientos, Miguel A. Lazo, Emmanuel Matamoros, Eliseo Moreno, Sebastian Segovia, Adrian Suarez, Agustin Lara, Lisa Solis, Denisse Gonzalez	Ruby Red I
6B STEM Teacher Practices (Practitioner) **Engineering Girls Rock!** Engineering girls are strong, smart and bold! Learn hands-on activities that introduce engineering concepts, promote problem solving, and introduce artificial intelligence. Participants will also learn about books and online resources that are available to get girls interested in engineering! Melinda Wright, Central Texas College for Kids	Ruby Red III
6C STEM Practitioner Workshop **Who needs more food, a mouse or an elephant?** *Why are flying squirrels in the Arctic more than 50% larger than those in Central America? Animals adapt to their environment. Part of this adaptation involves their body measurements pertaining to the direction of heat flow.* Anthony Bailey, Jeng-Jong Tsay, University of Texas Rio Grande Valley	Ruby Red II
6D STEM Practitioner Workshop **Google CS First** *Get a first-hand look at Google's FREE computer science program with FREE instructional and club materials geared towards 4th-8th graders. Google*	Royal Palm I

offers 3 Easier Activities (High Seas Activity, Gumball's Coding Adventure, Create Your Own Google Logo), 2 Easier Club Modules (Storytelling, Music & Sound), 3 Moderate Club Modules (Friends, Fashion & Design, Art), 3 Challenging Club Modules (Social Media, Sports, Game Design), and 1 Advanced Club Module (Animation) all of which are 100% FREE. Target audience: Elementary, Middle School (4-8) Presenter: Gianna Colson **100Kin10 Listening Session** *CALLING ALL STEM TEACHERS: WE WANT TO HEAR FROM YOU! You are invited to join a Listening Session to share your experiences and perspective as a STEM teacher. We want to hear your opinions, ideas, struggles, and successes to help inform and share insights around STEM education and programs with 100Kin10 as we work to shine a national spotlight on the need for great STEM teaching.* Presenter: Gianna Colson	
6E STEM Practitioner Workshop **Making STEM Fun, Easy, and Effective** *Wondering how best to infuse STEM in your science classroom? Do you want to learn how to create STEM lessons using your favorite science lessons as a starting point that are both engaging and enriching for your students? Answers to these questions, and more, will be answered in this hands-on minds-on session delivered by Dr. Milton Huling, the author of recently published NSTA book – Designing Meaningful STEM Lessons.* Presenter: Milt Huling, Polk State College	Concierge

Lunch Plenary
11:00 AM – 12:30 PM Royal Palm II and III

Lizette Ramos de Robles,
Qué ofrece la educación científica y la educación para la salud al bienestar de niños y adolescentes con enfermedad renal crónica?
What does scientific education offer for the well-being of children with chronic kidney disease?

Concurrent Session 7
12:30 PM – 2:00 PM

7A Diversity, Equity, and Inclusion **Efforts to Improve Student Success and Retention in STEM at Hispanic Serving Institutions** *Student learning and engagement through Spanish led biology and algebra courses. This session is of interest to high school students, educators, and administrators.* Juan Salinas, Alexis Racelis, Francisco Guajardo, Angela Chapman, Cristina Trejo, University of Texas Rio Grande Valley	Ruby Red I

7B STEM Practitioner Workshop **Apples and Gravity – The needed Resource you have been waiting for…** *Are you facing the same problems as many 5th grade Science teachers in the state of Texas? Let me guess? Such as using resources that have no alignment, contain unnecessary content, unappealing, not student friendly, no Spanish version, and of course a limited time of have to fit all required concepts before May! This workshop will present you with a resource that has been created and implemented by a teacher that acknowledges the necessities of her diverse students. A meaningful resource that can turn into an essential tool for student comprehension, application, and evaluation. An instrument that has eliminated a textbook and worksheets monotony and has provided time to check for understanding and hands on activities.* Auristela Garcia, San Benito CISD	Ruby Red II
7C STEM Teacher Practices (Research and Practitioner) **Tiny Earth: student sourcing antibiotic discovery** *Tiny Earth is a network of instructors and students focused on crowdsourcing antibiotic discovery from soil. It seeks to inspire students to pursue careers in science through original laboratory and field research conducted in introductory courses with the potential for global impact. It also addresses the diminishing supply of effective antibiotics.* Ana Barral, National University **Supporting STEM teacher readiness toward inquiry-based learning for all students through a Collaborative Community of Practice** *Leveraging STEM inquiry learning experiences increases student engagement and achievement. All students benefit from a classroom environment where they can inquire, collaborate, and iterate their thinking. By positioning students to access prior knowledge, develop conceptual frameworks, and engage in metacognition, teachers provide valuable STEM learning experiences to all students within their classrooms as an act of equity and inclusion. Targeted STEM lab school practice coupled with instructional coaching is an effective means of supporting STEM teacher readiness.* Corin Slown, California State University Monterey Bay	Ruby Red III
7D Learning Environments (Research and Practitioner) **Identifying Critical Student Skills Between k-12 and College for Successful Transition in Engineering** *The objective of this interactive workshop is to identify the inventory of skills critical for incoming college students. What are the skills missing in incoming k-12 students? How can the college contribute with k-12 schools to promote these skills? What are the skills for successful college completion?* Noe Vargas Hernandez, Javier Ortega, Jorge Ceballos University of Texas Rio Grande Valley	Concierge
7E Learning Environments (Research) **Implementation of Student Mentoring and Research Training (SMART) Program at UTRGV to Improve Undergraduate Research Experience** SMART program at UTRGV provides an increased number of undergraduate student research opportunities by building triadic teams comprised of faculty mentor, graduate student assistant, and undergraduate research students. Here we will present the SMART program outcomes, quantitative and qualitative data collected from student mentees and graduate mentors.	Royal Palm I

Nazmul Islam, University of Texas Rio Grande Valley **High-Impact Practices in STEM Learning** The researcher will share high-impact practices (HIPs) in P-16 STEM education and how experiential learning impacts STEM learning. Background of HIPs will be introduced. Drawing from an empirical study and meta-analyses from literature. The researcher will discuss findings and practical implications with attendees. Pierre Lu, University of Texas Rio Grande Valley	
7F STEM Practitioner Workshop **Hidden in Plain Sight: Discovering STEM Potential** *To create the multi-faceted STEM workforce that's needed to face the demands of an ever-changing STEM landscape, it's imperative to look beyond the stereotypical skills of technical proficiency in science, math, and technology, to find untapped STEM potential in a more diverse group. To discover the innovators of tomorrow, we can't use the same rubrics implemented today to define who has STEM potential. In this session, you'll learn what skills are required to meet the STEM challenges the future holds, the current STEM paradox, ways to recognize non-stereotypical STEM potential, and tools to create an environment that cultivates soft skills.* Leslie Diamond, Texas Alliance for Minorities in Engineering Intended Audience: Early Child, Elementary, Middle School, High School, Informal Educators, Administrators	Wine Room

Closing Address, Remarks, and Recognitions

2:00 – 3:15 PM Royal Palm II & III

Closing Keynote Address by Dr. Alejandro Gallard Martinez

Do you think if you created a mirror you could change your pedagogy?

Closing Remarks and Recognitions

Dr. Patricia Alvarez McHatton, Executive Vice President for Academic Affairs

Notes

Notes

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UTRGV STEM Education Consortium Steering Committee

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Our Guest Speakers:

Konstantinos Alexakos, Professor and Program Coordinator for Adolescence Science Education at the School of Education, Brooklyn College, CUNY

Alejandro Gallard, Professor and Goizueta DListinguished Chair at Georgia Southern University

Lizette Ramos de Robles, Professor of Biology and Environmental Health Sciences at the Universidad de Guadalajara, Mexico

Kenneth Tobin, Presidential Professor, The Graduate Center of the City University of New York

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SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

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