Giving Students Options

“Applying to college is more than just applying, it is a process and the process begins years before the student even enters 12th grade.”

Finding My Tribe

“Upon arrival, it didn’t take long to realize that I was among “my people”: A like-minded group of individuals looking to share ideas and experiences that could help foster creativity and innovation in our home schools.”

2017 Professional Conference:
- Program
- Excursions
- Keynote Speaker
- Sponsors
NCSSS Schools Continue to Change the World

As the current president of NCSSS, I have been afforded numerous opportunities to meet and share ideas with experts involved in STEM and STEM education. I am always receptive to new ideas and technologies and I am eager to share what I have learned with others. It is by far the most rewarding aspect of my affiliation with the organization. More importantly, sharing new ideas and best practices is really what this consortium is all about.

Last year, I met Justine and John Diamond from the Enable Community Foundation (now known as LimbForge). They represent an amazing group of individuals from all over the world who use 3D printers to create free 3D printed hands and arms for those in need of an upper limb assistive device. Justine and John met with a group of students in our school’s Makerspace to lead a “group build” of prosthetic hands. Everyone involved was amazed at the impact the students were able to have with the greater community using 3D printers.

During the NCSSS 2016 Student Research Conference, all of the attendees participated in a group build as well. I was thrilled to hear that the Boston media recently ran a story of students at the Mass Academy in Worcester, Massachusetts and their work in building and donating the 3D printed prosthetic hands. I encourage all NCSSS schools to do the same.

In April, the NCSSS Board convened in Savannah, Georgia, for our regular Board Meeting. The meeting was hosted by the Savannah College of Art & Design, which proudly showed us their cutting-edge design and manufacturing labs, as well as their state of the art animation lab, where they work with the latest in motion capture technology. Needless to say my fellow board members and I were extremely impressed with what we saw. When I returned to my school, I immediately began figuring out a way to bring motion capture technology to our students. I am happy to share that I recently watched a student demonstration of our school’s new motion capture system and was pleasantly surprised at the reasonable cost of this groundbreaking technology. This technology will go a long way in helping students create virtual environments for a variety of applications.

In May, I attended the “Change the World” symposium held by The Mass Academy of Math & Science, one of our NCSSS member schools, at Worcester Polytechnic Institute (WPI) in Worcester, Massachusetts. My thanks to Mike Barney, the Director of Mass Academy, for inviting me to participate in this amazing conference. The symposium began with students of the Mass Academy demonstrating the software applications they had designed in conjunction with the organization “Apps for Good,” which has been adopted by several NCSSS schools across the country. The symposium continued with a STEM panel presentation as well as a panel discussion with some of Mass Academy’s Alumni. One question posed to the panel was “Where do you think you’d be if you hadn’t attended such a special school?” Each panelist agreed that without the rigorous education and support they received, their career paths may have been much different. They expressed gratitude for the people who founded and continue to support their school. I am certain that the alumni of all of our NCSSS member schools feel the same way. NCSSS schools are indeed changing the world!

“Sharing new ideas and best practices is really what this Consortium is all about.”
Now on to more pleasant topics. We have a great program lined up for the Professional Conference. We have a terrific keynoter, an IMSA graduate. Friday afternoon looks different. We listened to you and have some great roundtables set up with interesting topics. That will be followed by groups going to Second City before some incredible excursions on Saturday to IMSA’s campus, and then the world famous Fermi Labs.

As always, thank you for your support.

— TODD

With the President submitting his proposed education budget, I thought it was worth highlighting some key items pointed out by our partner StemEd Coalition:

- The 2018 Budget proposes $59 billion for the Department of Education, a $9 billion or 13 percent reduction.
- Title I: FY 17 was 15.9 billion, FY18 $16.9 Billion, added $1 billion in new program designed to be portable.
- Title II: Eliminated entirely the $2.4 billion Supporting Effective Instruction State Grants program
- 21CCLC: Eliminated entirely the $1.2 billion 21st Century Community Learning Centers after-school program.
- Title IV Part A: Student Support and Academic Enrichments (SSAE) Current $400 million, FY18 requested no funding but acknowledged Omnibus appropriations language about competitive program proposed elimination.
- Perkins CTE programs: $1.1 billion for FY17, FY18 proposes $876 billion, a cut of $168 million, includes a new $20 million set aside “that would support a competition to promote the development, enhancement, implementation, or expansion of innovative CTE programs in science, technology, engineering, and mathematics (STEM) fields.

Complicating matters is that there are still many top political positions to fill at DOE, including the Assistant Secretary for K12 education. A couple of weeks ago I met with the Acting Assistant Secretary for K12, who proceeded to tell me that he is not going to fill the position, and that they have not yet found that person.

What this all means is that Congress is going to drive this budget, not Ed nor the White House.

"Congress is going to drive this budget, not Ed nor the White House."

EARLY BIRD SPECIAL ENDS SEP. 15
ncssss.org/2017-conference
Giving Students Options

A professional school counselor’s view of helping students find the best fit in higher education

by Lauren Kurtz Lewin

The question “What leads students to higher education?” is the one question that that led me to my role of helping students complete the college application process. Eleven years ago, I assisted my sociology of education professor at the University of Georgia on a research project that changed my life and ultimately led me to wanting to impact other’s lives. I have been a professional school counselor at Rockdale Magnet School for Science and Technology for eight years and have assisted all of my seniors in the college application process. Applying to college is more than just applying, it is a process and the process begins years before the student even enters 12th grade.
In helping students in the process, I always focus on one word that I believe is the single most important word when it comes to the application process: options. My students having options is the goal I have for each and every student.

- **Options** for higher education.
- **Options** so the student has control of their decisions.
- **Options** to allow the student many doors to choose and many doors to open.

The college application process cannot begin without a list and options cannot be created without treating the list like a process. I often tell students and parents that creating a list is like a science. We use data, geography, logistics and feelings to create the list. I use the words Reach, Range and Safety to create a rough blueprint of a list.

Reach is a school that the students’ numbers (GPA and/or test scores) are below the averages, or a school that is highly selective and has low the averages, or a school that is highly selective and has

A Range is a school that the student meets admission averages and there is a 50/50 shot of the student being accepted.

A Safety is a school that the student’s data is higher than acceptance averages and the student has very high chances of being accepted.

Using the terms Reach, Range and Safety is certainly not exclusive and does not include other factors that are used in a holistic review process such as teacher recommendations, leadership, community service, character, essays, etc., but merely gives me and the student an idea to create balance and options in the list. I have had students say to me before “what if I don’t get into a college?” In my eight years, I have never had a student not get into college. If the student completes their applications and follow the guidelines of Reach, Range and Safety, they should not be in a position of rejection to all of the schools on his/her list. The list is individualized and should look different for each student.

Schools that are “Safeties” often provide opportunities for students to join honors programs or receive merit-based scholarships. A safety can also be a school that is a safe financial option. A requirement that I feel passionate about is requiring at least one of the schools on a student’s list to be an in-state public safety. For many students, moving across the country for college does become a reality, but for many, students realize the financial realities and need to have options that will be financially realistic.

College Fit (Geography, Culture, Financial, Social Life, Academic) is incredibly important to discuss and to use when creating a college list. Discussing College Fit is important, but it may be difficult to really understand it without actually stepping on the specific college’s campus. When it comes to college size, some students like to predict what is the best fit for them, but it is often hard for them to really know. For example, a student may say they do not want to go to a small school, but a small school in a large city may give them exactly what they need. College size is relative and is a funny concept for students to grasp what they need and want. Some students also underestimate the importance of college fit while creating the list or while actually choosing the school to attend.

**“Applying to college is more than just applying, it is a process and the process begins years before the student even enters 12th grade.”**

**Questions students can ask and consider when picking campuses (From a student voice):**

- **Do I want to live in the dorms all four years? Is housing available for all freshmen?**
- **I want to be able to come home for the holidays?**
- **Is it important that other students are just like me? Do I want most students to be different from me? Do I want a diverse campus where I meet students who are both similar and different from me?**
- **Is weather a factor? Would I be happy in the snow? Do I like the heat?**
- **What surrounds the campus? Do I like the campus to be in a big city but be a self-contained campus? Do I want to spend my weekends camping and hiking? Do I want to be able to access a big city easily, but not actually go to school in the city?**
- **Do sports matter? Do I want to go to a school that has a Saturday football atmosphere? Do I want to be involved in club sports?**
- **What level of academic rigor is appropriate? Do I want to participate in undergraduate research? Do I want to be in a competitive but collaborative environment?**
- **Is my major offered? Am I certain this is what I want to study? What classes are offered in my major? What opportunities for co-op or internships are available for my major?**
- **How will I manage my classes while working to pay for school? How much will I need to pay out-of-pocket? Will I be able to get scholarships as a sophomore?**

This list is not an all-inclusive list and could certainly continue. The important thing is that the questions are being asked and students are thinking about their answers. The answers can change and the student may find them irrelevant, but they are at least thinking. Sometimes these questions do not matter and the student picks what they can pay for. Sometimes the student just walks on campus and gets “the feeling.” However they arrive to their decisions, regardless if it was the right decision or not, they have at least been thinking critically.

My role is to not decide for the student. My role is to educate the students on what they need to look for and how they need to navigate the application process. Ultimately the student decides and sometimes it is not the right fit because sometimes fit cannot be determined until the student is actually a student on campus.

Sometimes, students do not allow a school to be a good fit because they do not get involved and meet new people. Whether a student has the greatest experience, transfers, decides not to stay in school and works instead, my goal is to help the student realize that they have options and they have the confidence to navigate through their life decisions. By helping my students, I have options before they even leave, I am helping them have options for the rest of their lives. There is no other role I could possibly dream of having in their lives.

---

**LAUREN KURTZ LEWIN**

Lauren Kurtz Lewin attended the University of Georgia and received a Bachelor of Science in Psychology and a Bachelor of Arts in Sociology. For undergraduate school, she attended The Citadel Military College of South Carolina and received a Master’s Degree in Counselor Education. In July of 2009, Mrs. Lewin began her role as a Professional School Counselor at Rockdale Magnet School for Science and Technology in Conyers, GA. She is trained and specializes in crisis counseling, personal, social, and emotional counseling and support, academic advising and four-year planning, career advising and planning, and college advising and planning. During her past eight years at RMSST, she was worked extensively to develop a comprehensive college advisement program to assist students in the college application process beginning in 9th grade.
Wentworth’s Five Factors of Career Success

Wentworth offers a unique combination of five factors that help ensure career success through a seamlessly integrated program of learning, building, and doing. Yesterday’s credentials are no match for the challenges of the future—only at Wentworth do all these factors converge and prepare you for the career you envision.

1. Focused Academics
   Wentworth requires two semesters of cooperative learning experiences (co-ops), where students apply classroom knowledge in real-world environments. Through co-ops, students learn to produce in actual, unpredictable work situations.

2. Innovative Entrepreneurship
   Wentworth provides opportunities for students to identify and fulfill technical, societal, and economic needs with innovative ideas and solutions that the world has never seen before.

3. Cooperative Learning
   Wentworth collaborates with a host of universities, corporations, and community partners on a wide range of projects. These opportunities provide students with hands-on experience as well as important professional connections.

4. Collaboration & Partnerships
   Wentworth’s academic offerings are rigorous, relevant, and experiential. Our programs emphasize both curricular and extracurricular learning, enabling students from different majors to collaborate on complex projects—just as they would in the workplace.

5. Ideal Location
   The Wentworth campus is conveniently located within a world-class center of technology, business, and culture. Some of the most respected institutions of higher learning, medicine, and finance are based in Boston.

Wentworth’s academic offerings are rigorous, relevant, and experiential. Our programs emphasize both curricular and extracurricular learning, enabling students from different majors to collaborate on complex projects—just as they would in the workplace.

Finding My Tribe

A first-time Professional Conference attendee offers his thoughts on the value of the Conference

by Tyrone Huebsch
Upon arrival, it didn’t take long to realize that I was among “my people”: A like-minded group of individuals looking to share ideas and experiences that could help foster creativity and innovation in our home schools.

I was able to see and hear about STEM programs from across the country. We took invaluable field trips to Worcester Polytechnic Institute and MIT. In doing so, I was able to validate that what my school is selling is what the next level is buying so that I could make real connections for my students. These trips also helped to spark discussions in formal breakout sessions and at morning coffee about the similarities and differences in our home districts, the inherent challenges of educating for innovation and strategies to keep the train moving forward.

One idea I took home with me relates specifically to the Independent Research course I teach. The idea of a pre-research cohort to develop skills in reading, analyzing and presenting primary literature could prove beneficial for my students prior to their beginning their independent research projects. I look forward to this year’s post-planning discussions to see if this idea followed by a research cohort where students collaborate to support one another’s work, troubleshoot, share the experience and encourage one another could not become part of our school’s development and support system for student researchers.

Since the conference, I find myself being better able to communicate to my students what some of the options are that lie ahead for them and ways to access opportunities. The first-hand exposure to what is going on at other schools, what industries are looking for, how others overcome challenges inherent to STEM education and the enthusiasm for teaching and learning were really uplifting. I left feeling my batteries had been given a boost and that I had made meaningful connections with other professionals.

TYRONE HUEBSCH
Research Instructor
Rockdale Magnet School for Science & Technology

Tyrone Huebsch has taught Research at Rockdale County Magnet School for Science and Technology in Conyers, GA for the past three years. He has been an educator for 25 years at the middle and high school levels in traditional, alternative, public and private schools as both an administrator and classroom teacher. Mr. Huebsch enjoys the collaborative nature of working in a supportive research department that facilitates independent, authentic, student-driven work. In his time at RMSST he has had multiple recognitions from students as an honor teacher. Tyrone holds degrees from the University of WI- Eau Claire and University of WI-La Crosse. He is an avid outdoorsman, recreational musician, tinkerer and an owner of the Green Bay Packers.
### AGENDA AT A GLANCE

#### WEDNESDAY, NOVEMBER 1
- 1:00 pm - 6:00 pm: Registration Open
- 1:00 pm - 3:00 pm: Excursion (Illinois Institute of Technology)
- 6:00 pm - 7:00 pm: Reception

#### THURSDAY, NOVEMBER 2
- 7:00 am - 6:00 pm: Registration Open
- 7:45 am - 8:45 am: Breakfast
- 9:00 am - 10:00 am: Keynote Speaker
  - Major Kenyatta H. Ruffin
- 10:00 am - 10:50 am: Concurrent Sessions
- 11:00 am - 11:50 am: Concurrent Sessions
- 12:00 pm - 1:00 pm: Lunch
- 1:00 pm - 2:00 pm: College Fair
- 2:00 pm - 2:50 pm: Concurrent Sessions
- 3:00 pm - 3:50 pm: Concurrent Sessions
- 6:00 pm - 8:00 pm: Reception

#### FRIDAY, NOVEMBER 3
- 8:00 am - 9:00 am: Breakfast & Business Meeting
- 9:00 am - 9:50 am: Concurrent Sessions
- 10:00 am - 10:50 am: Concurrent Sessions
- 11:00 am - 11:50 am: Concurrent Sessions
- 12:00 pm - 1:00 pm: Lunch
- 1:30 pm - 2:30 pm: Concurrent Sessions
- 2:30 pm - 4:00 pm: Concurrent Sessions
- 2:30 pm - 4:00 pm: Panel & Roundtable Discussions
- 8:00 pm - 10:00 pm: Second City Event (additional purchase at registration)

#### SATURDAY, NOVEMBER 4
- 8:00 am - 1:30 pm: Excursion (IMSA/FermiLab)

---

**SPONSORS**

- [Loyola University Chicago](#)
- [Illinois Institute of Technology](#)
**NCSSS PROFESSIONAL CONFERENCE**

**THURSDAY, NOVEMBER 2**

**9:00 am - 10:00 am**

**Keynote Speaker**

**STEM Summer Camps as a Recruitment Tool**

Introduce students to STEM and your program at the same time! The Kansas Academy of Mathematics & Science uses summer camps to engage students in STEM disciplines at a young age with the hope they will consider attending KAMS in the future. This education session will share with you the framework and strategies in using summer camps. Assessment data from the KAMS summer camps will be shared and discussed. Let your summer camp be the start of a student’s lifelong journey in STEM.

**Presenters:** Regina Tolbert, Roger Schieffersee

---

**11:00 am - 11:50 am**

**Calling All Future Scientists and Engineers!**

Recruiting is the lifeblood of our school. It’s our first opportunity to share the unique programs and opportunities that make our campus thrive. Here at J.Jay Science & Engineering Academy, recruiting is a warlike effort. From elementary outreach, to middle school science fair judging, we are always finding ways to promote our school and attract potential candidates. During our presentation, we will learn about our comprehensive recruiting program and how we consistently attract a diverse population of students who have a passion for science and the perseverance to achieve high academic success.

**Presenters:** Dr. Lynnette Clark

---

**10:00 am - 10:50 am**

**The “How’s and Why’s” of Onsite Student Research: Creating Opportunities for All Students Through Research Class**

Rockdale Magnet School for Science and Technology’s Research Department excels at helping students develop, plan, and execute competitive research projects all within the on-campus environment. This approach allows a large number of students from diverse backgrounds to succeed in a variety of research competitions and effectively differentiate themselves during the college application process. This presentation will explore how the supporting administrations and the research teachers work together to make “in house” research successful.

**Presenters:** Scott Bolin, Jennifer Kimney

---

**Bring Authenticity to your Coding Program**

Explore MobileMakersEd curricular and professional development programs in the growing field of coding. Created around experiential learning, authentic real-world skills, and connections to the developer community, the program drives student engagement and re-energizes teachers.

**Presenter:** Jessi Chartier

---

**Building STEM Confidence and Capacity in Girls**

Stellar Girls middle-school program to build self-efficacy and STEM skills for girls. Wheeling High School uses this program as a mentorship model for high school girls and their middle school counterparts to provide a hands-on science/engineering experience in a girls-only environment. The program has built leadership capacity, boosted skill confidence and increased academic persistence in both the high school and middle school participants. The mentorship model provides social reinforcement to consider science and engineering a viable option for the future.

**Presenter:** Kathy Konyar

---

**Student Support in STEM Schools**

This session is designed to generate dialogue regarding methods to support students in STEM schools. In a diverse society, multiple measures are required to offer support for the needs of individual learners. The rigor and demands of STEM schools accompany high levels of stress and adaptation for high school students. This roundtable will address questions concerning support offerings for students with diverse needs. Specific support discussion areas include varying levels of academic strengths in advanced courses, preparation for high stakes exams, academic achievement, leadership, meeting developmental needs, differentiation, cultural responsiveness, organization, and stress management.

**Presenter:** Dr. Lynnette Clark

---

**Process Over Product - Using Google Docs to Encourage Experimentation, Failure and Brilliance**

Professional writers live by the maxim “first word, worst word.” One starts with nonsense garbage (hopefully with a nugget of potential) and nurtures it to something clean and shiny. But students and sometimes their teachers think more along the lines of “one and done,” expediting a refined product on the first draft. This session will present ways to encourage sloppy drafts and reward change rather than set unattainable goals of perfection that will deepen appreciation of the writing process for students and teachers alike.

**Presenter:** Richard E. Weems

---

**Standards Based Grading in the STEM Classroom**

Now in its fourth year of implementation at NCSSM, our Standards Based Grading approach for assessment in Pre-Calculus and Calculus continues to evolve. Come hear what SBG is all about, how it has worked in our courses, and how you can get started in your own classroom. This talk is appropriate for all administrators and teachers, not only for those of STEM fields. Sample standards and assessments will be provided for math, science, and language courses.

**Presenter:** Taylor Gibson

---

**Before Bob Dylan: Poets and Agitators in Popular American Music**

As teachers of history and literature, we ask students to read and to think critically about the past, the present, and their own lives. Bob Dylan’s receiving the Nobel Prize in Literature has led me to realize that I should help my students listen critically as well. All students listen to music, certainly more than they read, so I weave threads of music history into my class to help them understand the roles music has played in shaping American society and to provide a context for current music. Please join me in discussing popular American music: Its history and literature.

**Presenter:** John Woodrum

---

**Cross Curricular Project Based Learning - Physics and Computers Science**

Cross Curricular Project Based Learning - Angry Robots! Using PBL and computer science to enhance the understanding of physics and computer science concepts. In this session we will review our projects, provide them in word format and lead the attendees to sketch out their own cross curricular project.

**Presenters:** John Chapin, Jacob Voetberg

---

**Developing a Course Focused on Biological Problems in Contemporary Society: Opportunities for Interdisciplinary Connections, Differentiation, and Integration of Technology**

Educators will have the opportunity to learn about development of a topics oriented upper level biology course. Experiences in course establishment, recruiting students, incorporating reputable resources, as well as developing original activities and projects will be discussed. Objectives of the course, their applications to problems faced in scientific research and society at large, as well as ways in which the class can be tailored to student interests and talents will be incorporated. Opportunities for modification over time to introduce responsible use of new technologies will be demonstrated. Examples of differentiation for gifted learners and example student products will be shared.

**Presenter:** Rebecca Phillips

---

**Math**

**Science and Engineering**

**Humanities**

**Computer Science**

**Wellness**

**Science and Engineering**

**ADMINISTRATION**

**PROGRAM**
The Mathematics Classroom: Group Work vs. Working in Groups

How many times have we heard from colleagues and students, “groups in math class don’t work”? Over the years, my response has developed into a question: “Do you mean working in groups or simply sitting in groups and working?” I have been successfully using group work for nearly 30 years to take advantage of peer sharing and guided instruction. In addition to encouraging conferences participants to share thoughts and questions, I will share tips for a successful classroom and sample group activities. I will also share research supporting the effectiveness of group work in the classroom.

Presenter: Donna Robinson
Adventures with Electronic Student Lab Notebooks
How can we increase the learning value from science student notebooks? Science students engage in the authentic practice of keeping research notebooks to organize their workflow, handle materials safely, follow protocols, document progress, showcase their hard-earned data analysis, problem solve, or obtain feedback on thinking, and for grades. What advantages do electronic notebooks offer? Drawbacks? This workshop documents our first year of electronic notebook use with senior researchers and electives students and why our students protested when we suggested returning to traditional paper notebooks. See student samples, ask questions and share your experiences with electronic or traditional science notebooks.
Presenter: Andrea Cobb, Ph.D.

Thriving: Connecting Academic and Social Skills to Promote Leadership Development Among Gifted Students
Leadership development in gifted students is important to their educational experiences, decision making, and overall social development. In most institutions with a gifted student population, the idea of leadership development is an abstract thought. Often times leadership is correlated with giftedness and academic success. This correlation may lead to a lack of understanding of leadership and a lack of opportunities for leadership development. The implications are poor decision making by student leaders and a lack of commitment from our student leaders and possible removal from the position. The purpose of this session is to discuss leadership development opportunities that can assist students in their positive leadership behavior and journey.
Presenter: Cathy Thomas

Science and Engineering

Science Meets Humanities: Researching & Communicating Today’s Science
This session will demonstrate how English/humanities classes can collaborate with science and library partners to produce meaningful student science essays and audiovisual products. We will discuss how to scaffold student research in cutting-edge science and incorporate student chemistry lab experiences into compelling science narratives. From purposeful research to focused persuasive writing to symposium product, this session will discuss how you can offer students a meaningful opportunity to investigate and communicate innovative STEM ideas with professionals and peers.
Presenters: Jennifer Seavey, Anne Apel

Math

Games in Mathematics
I will talk about ways in which I have used traditional games (bingo, tic-tac-toe, Jeopardy, etc) to help students review material and practice difficult mathematical concepts. I will also talk about some games that can be used to teach mathematical principles including ideas from Abstract Algebra and combinatorics.
Presenter: Nicole Kiesinger

Wellness

State Supported Residential STEMI: Similarities & Differences
This session is the result of a 5-year research project that looks as the similarities and differences among state-supported residential programs. During the hands-on portion of the session, we hope to gather additional data and insights on each of our residential campuses and to advance the proposed development of a student leadership role where representatives from across all residential campuses participate in monthly virtual training sessions hosted by each campus and a yearly student summit where representatives explore common challenges or issues facing state supported residential communities and develop sustainable approaches to meeting them.
Presenters: Letitia R. Mason, Akiko Agius

Computer Science

Flipping Pieces - How to Build Successful Tech-Flipped Activities and Lessons
The research is in … Students enjoy using technology to engage in learning activities both inside and outside the classroom. Using technology successfully to flip classroom instruction does not have to be an all or nothing proposition. Current research suggests that using video micro lectures to offload instruction through homework or out-of-class activities can provide more time in class for student-centered activities, investigations, and the construction of knowledge – “off-loading instruction” to promote “construction”. Video micro lectures are also a good way to accelerate, differentiate, and provide open-ended investigations of challenging concepts for our students.
Presenter: Laura C. McConaughey

Humanities

Puzzlepalooza: An Interactive look at engaging students in learning through puzzles
Are you looking for ways to engage gifted learners? Puzzle hunts provide an opportunity for students to work on problems where solutions or even directions are not immediately evident. The “Puzzle Lords” of Montgomery Blair HS will share their successes and challenges from the eight years of Blair Puzzlepalooza. This will be a hands-on session in which participants will have the opportunity to dive into sample puzzles and work collaboratively on a truly out-of-the-box intellectually stimulating activity.
Presenters: James Schaller, David Stein, Peter Ostrander & Peter Hammond

Math

It’s Gettin’ HOTT in Here: Promoting Higher Order Thinking with Technology
There’s no doubt that technology engages our students, but are they cognitively engaged? In this session, participants will learn about technology-based classroom activities that allow students to connect with content in meaningful ways while remaining motivated and engaged as they are driven by lessons that culminate in HOTT (Higher Order Thinking + Technology) activities. We will also discuss ways in which teachers can utilize technology to facilitate classroom discussion around student work to further promote higher order thinking and deepen understanding of concepts.
Presenter: Becky Sherring

Creative Thinking as Critical Thinking
With a focus on the interrelation of situations in order to create and resolve problems, along with the use of structural tools from fields like logic and cartography, a creative writing course can also be a course in critical thinking. STEM students benefit in multiple ways: the ability to construct and dismantle scenarios translates into math, engineering, and science research courses, and the ability to explore and develop identify build confidence and necessary tools for innovation.
Presenter: Dr. Nicole Sarrocco

Wellness

Do Your Students Matter?
The central component of matter is the students’ perceptions that they are important, significant, and of concern to another individual, an organization, or the world. These perceptions play a role in the persistence and retention of students and more importantly, their overall well-being. Research has shown that students who believe they matter to their institutional are more motivated to learn. What are you doing to make sure your students know they matter?
Presenter: Roger Schieferecke, Regina Tolbert

Computer Science

Coding Arkansas’ Future with Apps for Good
This session details how ASMSA has leveraged Apps for Good to strengthen our Computer Science outreach program, connecting us with teachers and students we otherwise might have missed. Apps for Good is a global community of over 1,500 educators empowering a generation to change their world through technology.
Presenters: Daniel Nol, Denise Gregory

Humanities

Humanities

Piling Good Things: Using Science Fiction and Fantasy to Enhance Empathy
Empathy understanding is critical for developing positive social relationships in youth, so how can school officials facilitate this growth in a manner that is appealing to students? One way would be by using relatable works of science fiction and fantasy that they regularly consume. Join us to discuss such works as Doctor Who, Star Trek, Buffy the Vampire Slayer, The Twilight Zone, Quantum Leap, and others and how they can help enhance empathy in your students. Whether you prefer to boom-or roam occasionally later at night, you are sure to have a good time learning applicable skills!
Presenter: Heath Stevens

Science

Science and Engineering

Math

The Inner Light: The Great AmericanTotal Solar Eclipse of 2017
The great American total solar eclipse of August 21, 2017 presented both the secondary academic community as well as the general public with the greatest and most widespread appeal to STEM interfacing and empowerment with overall and overarching national educational standards and aspirations. The following presentation will detail one such expedition, outreaching to a small community in western Nebraska and outlining the steps in directing new horizons for today’s secondary school boys and girls based upon astronomical opportunities. The opportunity to kindle commitment to long term investment in experimental science will highlight the presentation.
Presenter: Lawrence Britz

Administration

Let’s Get this on Paper: A History of the SCHS’ Student Media Program
This is a history of the Student Media Program at Schurr High School, a student published student newspaper that is in its 63rd year of publication. The purpose of this session is to provide background to the rich history of the student media program.
Presenter: John Shaw

Math
STEM Innovation & Entrepreneurship Go Hand in Hand (Part 1)

Innovation and entrepreneurship are joined in this interactive and collaborative workshop which focuses on how to turn students’ innovative ideas into entrepreneurial actions. Participants will be given a real-world problem in the market to solve and work together to create a marketable STEM-based solution. Get ready for a fast-paced exercise in brainstorming, problem-solving, collaboration and out of the box thinking. Your solution will be pitched to our sharks and may be the best STEM product win!

Presenters: Laura Boyd Smith, Kathryn Gossa

The Neuroscience of Mindfulness: How to Encourage Wellness on Your Campus

In this session, participants will learn: The definition of Mindfulness, neurophysiological underpinnings of Mindfulness and learning, practical classroom applications of Mindfulness via experiential learning, and how to create mindful spaces on campus.

Presenters: Meghan Butler, M.Ed., Marissa Rivera, M.A., LPC

Project-based, Collaborative STEM Education for High School Students: MIT Beaver Works Summer Institute

The MIT Beaver Works Summer Institute (BWSI) is a rigorous, world-class STEM program for talented rising high school seniors. In its first year, the program featured an intensive, hands-on, project-based challenge through which teams of students learned how to navigate an autonomous mini-racecar through a complex environment. This program culminated in a final race when the students put their new skills and knowledge to the test against the clock. In this session, we will provide the details of this new program, its teaching objectives, and its results. We also briefly discuss future directions and opportunities.

Presenters: John Vivilecchia, Jane Abbott Connor

Transitioning the Transition: Best Practices and Support for Trans Students in a Residential Setting

This session provides an opportunity to discuss theory, best practices, and current practices of institutions surrounding issues that concern transgender students. Approach of residential halls will be formulated, as this session appears to present the most issues, but all perspectives are welcome. The goal is to walk away with a better understanding of transgender students in a residential setting, how we can better support these students, and current practices being implemented.

Presenter: Kim Howell

Holistic Admission Application Review in Pharmacy Education

St. Louis College of Pharmacy is implementing a holistic admission application process for the 2015-16 recruitment cycle, which will allow us to evaluate experiences and attributes beyond the traditional academic metrics. We hope to attract, admit and retain students who have the resilience, persistence and desire to succeed in our rigorous academic program and as healthcare practitioners. This session will demonstrate how the holistic review process was developed; how the process ties into the College’s mission, vision, and values; how candidates will be evaluated; and what this process means for students currently in secondary and post-secondary STEM programs.

Presenter: Elizabeth Konaruskis

Virtual Reality for Educators

This presentation will introduce attendees to Virtual Reality (VR) and its uses within an educational environment. An overview of current hardware and software options will be provided so that educators have a basic understanding of the range and costs of VR options at this time. A profile will also be provided of a real-world project created by high school students in partnership with an external partner organization. Finally, the benefits and challenges of working with VR will be covered. A discussion of possible future directions will wrap up the presentation.

Presenter: Scott Lang

A Librarian, a Historian and a Computer Scientist Walk into a Classroom: Digital Humanities Happens

In a collaborative teaching effort between faculty and staff, a digital humanities experience was created for U.S. History students at the Arkansas School for Mathematics, Sciences and the Arts. Students created mobile apps featuring artwork from cultural heritage institutions paired with interpretative essays that connected these objects to citizenship rights and responsibilities in the United States. This project required students to use and develop a broad range of skills, including historical knowledge and understanding, locate, evaluate and incorporate information, and technical skills. This session will include the project’s instructional scaffolding, lessons learned, student examples and the future of this project.

Presenters: Liz Miller, Daniel Moir, Dr. Neil Gates

Digital Story Assessment in World Languages

Digital Storytelling would seem a perfect tool for world language assessment in a STEM emphasis school. Many world language teachers are unsure how to begin such a process and digital specialists may not be aware of the constraints of language assessment markers. When media specialists along with world language teachers are able to see the process in a collaborative manner, the task is less daunting.

Presenters: Bryan Adams, Liz Miller

Solving Mysteries & Saving Lives: How Scientific Inquiry and Student-Led Learning Enhance the Classroom Experience

How can a newspaper, list of names and map be used to solve a mysterious disease outbreak? In this session, attendees will discover how to incorporate scientific inquiry, writing skills, public speaking, research and data analysis into a hands-on, student-led project that can be implemented in a science or research classroom. In this project students must determine the identity of a mysterious disease that’s infected a fictitious city, then propose how to contain it and present future outbreaks. Session will include project design and how the project can be differentiated up or down to meet the diverse needs of learners.

Presenters: Brittany Joslin, Amanda Micsenyi

Engineering as a Stealth Language Art

The language arts dimensions of engineering make it a powerful, if stealthy lever for building literacy. Lessons taught through the engineering design process can enhance students’ abilities in language arts like exposition, persuasion, narration, analysis, and description, to name just some. Find out how the engineering design process can support the development of literacy skills, and also, for native English-speaking students and English-language learners, alike. The session will include both a theoretical discussion of engineering as a stealth language art and several examples of specific programs that make it work.

Presenter: Eric Horsen

An Exploration of the Factors that Motivate Gifted and Talented Students from Underrepresented Populations to Engage in Science, Technology, Engineering and Mathematics.

This presentation will examine the factors that motivate gifted and talented students from underrepresented populations (Black/Latino, low-income and rural students) to engage in STEM at the Illinois Mathematics and Science Academy. In order to continue bridging the gifted and talented URP STEM education and career gaps, the racially and geographically based STEM achievement gaps need to be understood and studied further. Thus, this presentation will examine why certain URP Students have the motivation to engage in STEM, how that motivation is defined and measured as well as why they decide to pursue STEM.

Presenter: Adrienne Coleman

Virtual Reality Demos for Educators

Teachers who work in technology and maker space areas will have the opportunity to learn more about hardware and software they may be considering for inclusion in their programs. However, all teachers and administrators could benefit from hearing about the current state of the art in the areas of virtual reality. Both virtual reality (VR) and augmented reality (AR) are going to play a role in the future of education and this workshop will prepare them for further investigation of what role these technologies could play in their schools and school districts.

Presenter: Scott Lang

Makerspace round table

Science and Engineering

Drone Demo

Wellness round table

Second City Event (additional purchase at registration)

Panel & Roundtable Discussions

Science and Engineering

Presentation 2:00 pm - 4:00 pm
Major Kenyatta “Deacon” Ruffin

Major Kenyatta “Deacon” Ruffin is currently a student at the prestigious School of Advanced Military Studies (SAMS) where he is studying military strategy and operational design.

Major Ruffin grew up outside of Chicago, Illinois and first began flying at age 13. At 14, he soloed a glider in a flight program affiliated with the national Tuskegee Airmen, Inc (TAI). He attended high school at the Illinois Mathematics and Science Academy, was a member of Civil Air Patrol and became one of the nation’s youngest FAA Certified Flight Instructors (Glider) at 18 - two years before gaining his driver’s license! He graduated from the US Air Force Academy in 2003, earning a degree in aeronautical engineering and also has a master’s degree in military operational art and science, with a concentration in leadership from Air University.

Major Ruffin has been assigned to units in Arizona, Georgia, Kansas, Mississippi, New Mexico, and Texas, as well as stationed overseas in Japan and South Korea. Major Ruffin twice deployed to Iraq and once to Afghanistan, logging over 750 combat hours in the F-16 and MC-12 aircraft; he has earned seven air medals for his actions and most notably was the ISR mission commander for the second-largest special operations raid in Afghanistan history. His other military assignments include service as an Air Liaison Officer with the US Army and a T-38C Instructor Pilot at the Euro-NATO Joint Jet Pilot Training program.

With a passion for mentoring and inspiring youth, especially those interested in aviation and the military, Major Ruffin has worked with numerous youth programs and in 2012 founded the Legacy Flight Academy, a 501(c)(3) non-profit organization that conducts character-based youth aviation programs that draw upon the legacy of the Tuskegee Airmen (for more information see www.LegacyFlightAcademy.org). His combat experience and many other things in his life has deepened his faith and solidified the thing he cherishes most in this life - his family.

Major Ruffin is married to the former Tané Peterson of Philadelphia, PA, and they have five children, Tabitha and Lydia (9), Joanna (5), Thaddaeus (3), and Matthias (0).
The National Consortium of Secondary STEM Schools (NCSSS) was established in 1988 to provide a forum for specialized secondary schools focused on science, technology, engineering, and mathematics (STEM) disciplines to exchange information and program ideas.

**NCSSS Mission**

Our mission is to advance STEM education by providing professional development and networking opportunities for educators and learning experiences for students; to serve as a national resource for STEM schools and programs in partnership with educational, corporate, and international organizations; and to inform policymakers on STEM education.

**NCSSS Vision**

Our vision is to serve as the resource for secondary STEM schools by supporting collaboration and knowledge sharing and providing professional development for teachers and administrators to positively impact student achievement in authentic STEM educational environments.

www.ncsss.com