May 2024

GEORGPATHVAYS MAGAZINE

Understanding and Embracing

Diversity, Equity, Inclusion and Respect

The Value of Internships

A.I. Skills

Closing the STEM Divide

The Technology Association of Georgia Education Collaborative (TAG-Ed) strengthens the future workforce by providing students with relevant, hands-on STEM learning opportunities and connecting them to Technology Association of Georgia (TAG) resources.

Formerly the TAG Foundation, TAG-Ed is a 501(C)(3) non-profit organization formed by TAG in 2002. Later, the organization's name was re-branded to TAG Education Collaborative to facilitate our role as the leaders for K-12 STEM education in Georgia.

President / CEO Larry K. Williams

Interum Executive Director Dr. Loretta Daniels

> Publisher Wayne Carley

http://www.tagedonline.org

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Recycling Revival Heather Duncan / ORNL

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Understanding and Embracing SHELLY A. MUNOZ

Closing the STEM Divide Odalis Amparo

Careers in Technology Begin in High School

Innovation can happen at any time and at any age. Across Georgia, more forward-thinking educators and parents are encouraging students to start exploring their career opportunities early. High school internships are a fantastic way for teenagers to see where their strengths and interests can align with a potential career in technology. Here at the Technology Association of Georgia Education Collaborative (TAG-Ed), we launched a summer high school internship program. Our goal is to offer exceptional students with a technology career path, the opportunity to learn in a real-world environment, and get hands-on experience in a field of study relating to Science, Technology, Engineering or Math (STEM). After our team reviews the applications, students are matched with companies based on related interests and qualifications.

It is incredible to see the number of applications we received from high schoolers interested in finding an internship this summer. Nearly 500 students (489 to be exact) applied through TAG-Ed hoping to land an opportunity to explore their passion for technology. The quality of the resumes and the level of talent presented among these students shows that our future is bright. TAG Technology Association of Georgia



Workforce trend data shows that Georgia is on track to have another 100,000 jobs in technology by 2033, bringing that number to nearly 450,000 fulltime tech employees in this state. That means the students in high school today will be our leaders in technology in the very near future. The more we can do now to give our rising stars the ability to get the hands-on, practical learning experiences they need, the better prepared they'll be to take on the challenges of tomorrow.

We are seeing the profound impact and collaboration we have between educators and the business community to drive positive change. Thank you for all you do to help our students become future leaders.

Larry K. Williams President TAG / TAG-Ed

Larry K. Williams serves as the President and CEO of the TAG and the TAG Education Collaborative. TAG-Ed's mission is to strengthen Georgia's future workforce by providing students with relevant, hands-on STEM learning opportunities by connecting Technology Association of Georgia (TAG) resources with leading STEM education initiatives.



The Value of High School Internships

By Wayne Carley

High school students are expected to carry a huge load as they prepare for continuing education and job placement. For many committed families, this is a team effort with engaged parents assisting in supporting their child's efforts. One significant opportunity offered in Georgia is a robust High School internship program, provided by the Technology Association of Georgia, Education Collaborative.

Internship opportunities can begin as early as their junior year in high school, focusing on summer programs and placement for a few weeks to gain valuable exposure and experience. Some of these are paid internships, but student cannot put a price on the value of these programs. Real world and real career exposure for career paths of interest to them is usually an enlightening experience as the nuts and bolts of this career field come into focus. It's not unusual for interns to come to the realization that the reality of their interests differs from the actual job responsibilities and activities. This alone can save years of discontent, wasted time and money.

Studies show that this generation of graduates will average 4 distinct careers during their professional work life. The first chosen career is only the beginning of a diverse work experience and a perfect time to start building skills, communications experience, networking, investigation and clarity.

For most, this first internship is their primary exposure to the workforce and an eye opening view into collaboration, expectations, office politics and accountability. It may be a shock to some, but a necessary baptism into the working world. Whether the internship is with local companies, governmental agencies, higher education or nonprofits, it's a feather in their cap on resumes and college applications. Experience of any kind is a plus in the eyes of potential employers. Professional development and confidence start in high school.

Likely Benefits

Internships greatly increase employment potential for students as the majority of intern hosts offer their interns placement in their organization upon completion of their education. This is of great encouragement to the intern as well as filling the employment pipeline for the employer. The early support of the hosting organization can result in education assistance as well, which can be a turning point for those with limited financial resources.

Families and students often see intern-

ships as a stepping stone to college without necessarily have career ambitions with their host company. Nevertheless, everyone benefits from the internship experience.

The value of learning and hands-on workforce exposure in any industry lays important ground-work for interns as they evaluate their interests, options and per-sonal importance of career paths. As it's said, "knowledge is power", and internships are very powerful.



Internships are not new, but are certainly becoming more popular for companies and interns alike for the value of the experience. Seniors who pursue internships are certainly in an advantageous position to earn income, get an early start with a company and



possibly benefit from continuing education offerings from their host company. The wide variety of professions one can intern in offers an exciting scope of interests, from the medical field, database and computer science, local government, agriculture, construction, engineering, and dozens of other fields in need of motivated and available talent, soon to enter the workforce.

Experience

We'd like to hire you, but "you just don't have any experience"... perhaps the most discouraging words an applicant will hear. Several years of interning will change that conversation dramatically for the betterment of all involved.

There's no better way to get a real feel for a career of interest than to "experience" it firsthand. No amount of Google searches can replace the actual knowledge acquired within the field of interest. When confronted with the possible "unpleasant" tasks and reality of a career consideration, an intern may do an about face and launch into an entirely different directions. This too greatly benefits employers and students by avoiding wasted time and resources.

Preparing for college expectations is always challenging and usually a shock to unprepared students. It's unusual to find a high school class that adequately prepares students for those realities. An internship on the other hand offers much needed prep for accountability, deadlines, real-life consequences and the mental stress of it all. Entering the workforce is hard, and any preparation can only lessen the impact of work-life realities.

High School Internships

The Technology Association of Georgia Education Collaborative offers a unique and valuable internship program that lays out in detail the responsibilities of the intern, assuring that there is no misunderstanding about what is expected. This is of utmost importance for the student, their family and the host company to make this an effective and perhaps enjoyable experience. Pinning down the alignment between intern expectations and host goals is a must.

In my experience with this program, it's also necessary for student interns to understand that they are there to "learn" and not teach. Helping the host company to be more successful may not be the goal of the host, and interns should remember that they are interning to "serve" as potential future employees. The value of humility and listening cannot be understated. For some, they may be called upon to actually contribute in meaningful ways to the organization which is a huge boost to confidence and self-esteem, while keeping in mind they are there to listen, learn and explore the realities of this organizations atmosphere.

The best internship programs layout expectations in as much detail as possible, while gathering vast amounts of information about the student, their experience, scholastic achievements, community involvement and personality. This data is invaluable in proper placement with the best host company. Poor placement usually results in a less than successful internship.

An in-depth and exhaustive application process also "weeds out" those who are not completely committed to the process. It's not unusual for 50% of applicants to quit the application process prior to completion, which make my point. Motivated and committed interns are what employers are looking for. They translate into valuable employees.

The collaboration of parents and students to pursue internship opportunities is a valuable alliance in understanding the process dynamics, sharing parental experience, garnering support together and increasing the likelihood of effective placement. The family unit continues to be important throughout all levels of education and well into the workforce. A successful "group" effort in the internship experience is a win, win.



To understand STEM...

...you must DEFINE STEM, but you cannot define an acronym using the words it stands for; you must define the words the acronym represents.

Universities and organizations around the world continue to debate what a STEM career is. There is no doubt that "every career" uses STEM skills and this observation remains the focus of STEM Magazine.

Science: "The systematic accumulation of knowledge" (all subjects and careers fields)

Technology: "The practical application of science" (all subjects and careers)

Engineering: "The engineering method: a step by step process of solving problems and making decisions" (every subject and career)

Math: "The science of numbers and their operations, interrelations, combinations, generalizations, and abstractions" (every career will use some form[s])

For a moment, set aside any preconceived notions of what you think a STEM career is and use the above dictionary definitions to determine the skills used in any career field you choose.

These definitions are the "real" meaning of STEM and STEM careers.



ENGAGEMENT EXPO HOSTED BY GEORGIA AIM, LED BY PROJECT 3

GEORGIA AIM

Artificial Intelligence in Manufacturing

Join us for an exciting day of innovation, collaboration, and celebration at the Georgia AIM Engagement Expo! As we dive into the world of artificial intelligence (AI) in manufacturing, we invite you to be part of this transformative journey. We will have multiple community partners as well as Georgia AIM coalition members providing information on their organizations and respective projects. Refreshments will be served throughout the expo- Enjoy delicious snacks and beverages as you explore the future of manufacturing.



What to Expect:

- AI Demos: Experience live demos of AI technology that has been developed
- Community Engagement: Discover how Georgia AIM is fostering equity and inclusion across all communities.
- Inspiring Talks: Learn more about Georgia AIM and what resources are available to you
- Networking Opportunities: Connect with fellow professionals, students, and enthusiasts passionate and excited about this industry

Date:

May 22, 2024

Time: 8:00 AM - 1:00 PM **Engagement Expo Details**

Location: Georgia Cyber Innovation and Training Center Shaffer MacCartney Lobby 100 Grace Hopper Lane Augusta, GA 30901

Parking: FREE PARKING! Parking will be at the Nathan Deal Campus Parking Deck. 9 11th St Augusta, GA 30901



Contact:

For questions or concerns, please contact us at: georgiaaimproject3@russellcenter.org











Recycling Revival:

Jonathan Harter's initiative brings creative problem-solving to EV battery recycling

By Heather Duncan / ORNL

After being stabilized in an ambulance as he struggled to breathe, Jonathan Harter hit a low point. It was 2020, he was very sick with COVID-19, and his job as a lab technician at Oak Ridge National Laboratory was ending along with his research funding.

"It was a weird situation where I felt a little bit powerless — again. I thought, 'If I don't create an opportunity for myself, I'm done," he said.

Harter had been in challenging spots before. A first-generation college student from the local Tennessee hamlet of Walland, Harter was selected for an ORNL robotics internship in 2016 that helped pay his way through nearby Pellissippi State Community College. When the internship ended, he had to convince his ORNL supervisor to fund him for the first time through another internship.

It worked, and Harter has continued tackling tough challenges at ORNL ever since. His initiative and perseverance have frequently enabled him to turn dead ends into possibilities. Today he is a technical professional in the Energy Science and Technology Directorate, specializing in electronics recycling and high-voltage technologies.

"I knew I could learn quickly. I just needed a few people to believe in me and trust me to do important things," said Harter. "If you throw me into the fire, I figure it out."

The first to hand Harter a big assignment was now-retired ORNL senior researcher Tim McIntyre, who was



Jonathan Harter sets up electric vehicle batteries for safer disassembly using a robot at Oak Ridge National Laboratory. Credit: Carlos Jones/ORNL, U.S. Dept. of Energy

developing automation processes and controls for recovering critical materials from hard drives and electric vehicle, or EV, batteries. Harter credits McIntyre with providing him opportunities as an intern for meaningful responsibility and research, including developing projects and inventing disassembly methods and processes.

After Harter became a lab technician, McIntyre helped him improve his technical communication skills by sharing presentation and reporting duties. McIntyre encouraged Harter to act as a liaison with recycling companies to learn more about their needs, the technology they might adopt and details of their business operations. In many cases, companies indicated they were shredding entire batteries or hard drives for disposal without separating components for reuse.

Automated disassembly is safer and improves the quality and value of extracted materials such as copper and aluminum. "We like to talk about recovering the value instead of recycling," said Harter, who earned two patents in the process.

McIntyre and Harter demonstrated the fast, efficient recovery of rare earth magnets from hard drives for direct reuse, which is the goal for both profitability and environmental benefit. They also developed automated processes to recover materials and components from EV drivetrains and automotive lithium-ion batteries. The heart of the process is a large six-axis industrial robot arm with custom tooling.

The duo chose an older, off-the-shelf robot to show that the process could be affordable for scrap shops, enabling more widespread adoption of advanced recycling. The robot's pivoting, bright blue arm, with an "elbow" that bends above Harter's head, is guided by a controller and machine vision as it unscrews the bolts on an energized EV battery assembly.

For Harter, who takes all the safety training he can, working with the automated robot was appealing partly because its use could protect workers in salvage yards and maintenance shops from handling dangerous voltages.

Harter still hadn't given up on the classroom. Educational and career guidance during high school and college were scarce. Although he had completed associate's degrees in electrical engineering technology and industrial automation, Harter discovered he had not been in the right academic track to transfer to the University of Tennessee.



A close-up showing the numerous battery cells inside an EV battery module that we think of when we think "EV battery. Photo credit: (Carolos Jones/ ORNL, U.S. Dept. of Energy

He persevered, playing catch-up by taking more courses while working full time. But then the automation projects began winding down and McIntyre retired. That's when Harter came down with COVID while considering job options. He was finishing project reports when he got the call from Madhu Chinthavali, then a group leader in ESTD. Chinthavali had taken note of Harter's initiative and offered him the chance to try a new research direction.

"He learns fast," said Chinthavali, now head of the Energy Systems Integration and Controls Section. "This environment needs people like him, because when research morphs, he has the aptitude and mindset to adapt to those needs and take full ownership of the things he's responsible for." Working on power electronics, Harter began creating a test bed for grid systems components and adding automation capabilities to the Grid Research Integration and Deployment Center, or GRID-C. But he also helped stand up the facility during the COVID shutdown with the help of only a few colleagues working on-site.

"That's what's really fun about this place: I get to do some grunt work,

Jonathan Harter programs an autonomous guided vehicle that tows lithium-ion batteries, materials and systems around the battery recycling and reuse lab in GRID-C. Credit: Carlos Jones/ORNL, U.S. Dept. of Energy



which I enjoy, and I also get to develop lab space and invent new technology," said Harter, who has also worked jobs in construction, remodeling and carpentry. "I can take the initiative to pursue the things I want."

Now a technical professional after completing his bachelor's degree last year, Harter is recycling his own skills by applying his high-voltage knowledge to automation. Today he leads a multifaceted new series of projects related to automated recycling of lithium-ion batteries, which is vital to ensuring environmental benefit throughout their life cycle and beyond.

For example, Harter is focusing on advanced diagnostics to identify individual or failing cells among the hundreds to thousands inside a single EV battery stack. And because used batteries often still retain useful capacity — even if not enough to run a car — Harter is developing methods for combining them to build residential energy storage units. These battery clusters could provide a secondary home energy source when high demand causes a spike in electricity prices, such as during heat waves.

"I'm excited that automated battery disassembly is finally starting to be recognized more widely as an important opportunity," Harter said. "I can't wait



to develop new tooling to defeat certain joining technologies, take batteries apart really fast, and put together all the automation pieces. That is going to be fun."

UT-Battelle manages ORNL for the Department of Energy's Office of Science, the single largest supporter of basic research in the physical sciences in the United States. The Office of Science is working to address some of the most pressing challenges of our time. For more information, please visit:

energy.gov/science

Robot poised to take apart a battery. Photo credit: (Carolos Jones/ORNL, U.S. Dept. of Energy.)

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Ask About Bridge Builders Scholarship: TAG Bridge Builders and SkillStorm are committed to promoting equity and diversity in the workforce. Apply for a scholarship tailored to serve minorities in Georgia who are looking to advance their tech careers.

Sign up for a course today!





Al Skills: The New Currency in Today's Job Market

The AI revolution is here. Ever since ChatGPT arrived on the scene in late 2022, artificial intelligence has been reshaping the way we live and work. What does that mean for tech professionals looking to compete in a changing labor market?

TV pundits and talking heads love to get riled up about whether robots are coming for our jobs — but the truth is that AI will probably create more jobs than it eliminates. And one thing's for sure: understanding how AI works, and mastering AI skills, will be the key to success in tomorrow's ever-changing world of work.

New research shows that a growing number of companies are asking for AI skills in job descriptions — including non-tech roles. And a survey of HR professionals released last month shows that job candidates with AI skills ask for more money during the interview process — and tend to get it once they're hired. Simply put, AI is going to be underpinning nearly every job out there. That's why staying ahead of the latest in AI development is so important.

Building AI skills doesn't just mean learning how to engineer prompts for ChatGPT. It's everything from programming to data modeling and analysis to mastering concepts like machine learning and natural language processing. And if there's anything certain in our fast-paced economy, it's that building AI fundamentals today will translate to career opportunities tomorrow and beyond. That's where SkillStorm comes in. In partnership with TAG, we offer Microsoft Azure AI courses that are instructor-led, career-aligned tech certification courses and will help you build the AI skills that employers need. From the basics of AI and machine learning to a comprehensive understanding of how to design, deploy, and maintain AI solutions, you'll learn everything you need to accelerate a career in the economy's hottest fields.

It won't be long before all kinds of jobs, all across the economy, require AI skills. And starting now is the best way to accelerate your ascent up the career ladder. Build those skills today and you'll lay the foundation for opportunity for years to come — and set yourself up for success in an AI-driven future of work. <u>Register today</u> to get started with a career in tech.





Academy Award[®] Winner Matthew McConaughey Narrates MacGillivray Freeman's 3D Documentary for IMAX[®] and Giant Screen Theaters "Superhuman Body: World of Medical Marvels"

MacGillivray Freeman Films is pleased to announce that Academy award[®]winning actor Matthew McConaughey will narrate the company's newest 3D giant screen film, Superhuman Body: World of Medical Marvels, for release in select IMAX[®] and giant screen theatres starting this month.

Combining state-of-the-art CGI with live action cinematography and the immersive 3D giant screen experience, Superhuman Body explores the inner workings of the human body and reveals some of the incredible scientific breakthroughs that are changing the course of human health, as told through the inspiring stories of people who have benefitted from these groundbreaking innovations and the scientists and bioengineers who brought these innovations to life.

"Matthew McConaughey is a super talent, and his storytelling artistry will add warmth and personality to our film about the marvels of the human body and the human ingenuity behind these new technologies that are allowing us to live longer, healthier lives," said director Greg MacGillivray, two-time Academy Award nominee and chairman of MacGillivray Freeman Films.

"The inner workings of the human body are astonishing and complex,



and audiences will be fascinated to learn about its resilience and ability to bounce back with the help of the exciting new medical innovations seen in Superhuman Body," said Matthew McConaughey.

Added Shaun MacGillivray, producer, co-director and president of MacGillivray Freeman Films, "Superhuman Body is about not only the awe-inspiring workings of the human body but also the compelling human stories behind some of the most significant medical breakthroughs of the past decade. This film will inspire you, move you, empower you, and you'll be amazed by what your superhuman body can do."

"We are thrilled to partner with Mac-Gillivray Freeman Films to bring this story of these amazing medical breakthroughs to a global audience," said Larry Wood, corporate vice president at Edwards Lifesciences, a global presenting sponsor of the film. "We are delighted to have the talented Matthew McConaughey add his distinctive voice to the project."

Texas native Matthew McConaughey is one of Hollywood's most sought-after leading men. He has appeared in more than 40 feature films, including the cult classic "Dazed and Confused" which launched his career, and he received an Academy Award for his portrayal of Ron Woodruff in "Dallas Buyers Club." He is also a best-selling author, producer and philanthropist with his just keep livin Foundation – all the while sticking to his Texas roots and "jk livin" philosophy. Superhuman Body introduces audiences to the science and human ingenuity behind such medical breakthroughs as the revolutionary CAR T-cell immunotherapy that is saving the lives of people with leukemia; a pioneering technology called transcatheter aortic valve replacement (TAVR) so advanced that patients can be treated for heart valve disease without open heart surgery; and major advances in medical robotics and prosthetics.

Superhuman Body was made possible by the generous support of global presenting sponsors Edwards Lifesciences and Griffin Catalyst, the civic engagement initiative of Citadel Founder and CEO Kenneth C. Griffin. The film will be accompanied by a widespread outreach and education program designed to amplify the film's mission of inspiring the next generation of scientists and innovators, including virtual learning experiences; events where the audience will meet real scientists; a social media campaign to promote science and health; and educational materials that will be distributed in classrooms. virtual settings and science centers.

Added executive producer Michael Langer, "Superhuman Body and its educational programs have the potential to reach millions of people with its inspirational message about the power of human ingenuity and the high-tech medical advances that are saving human lives. My family, and especially my father Dr. Robert Langer, who is an MIT Professor and co-founder of Moderna, have long been advocates for getting kids excited about science and careers in STEM, and this project is the perfect platform for inspiring the next generation of doctors, scientists and researchers."

The film's educational outreach program is supported by an illustrious group of organizations including Kenneth C. Griffin and Griffin Catalyst, The Ambrose Monell Foundation, Richard King Mellon Foundation, Merkin Family Foundation, Burroughs Wellcome Fund, Eli Lilly and Company Foundation, The Citadel Foundation, Lyda Hill Philanthropies, Silicon Valley Bank, a Division of First Citizens Bank and 12-plus individuals who are leaders in the life sciences industry. Other educational partners include the American Association for the Advancement of Science, the Association for Women in Science and The Galien Foundation.

Distribution for Superhuman Body will include a theatrical run in IMAX and giant screen theatres located in the world's most prestigious museums and science centers as well as ancillary distribution on television and streaming broadcast services.

IMAX Trailer, Narrated by Matthew McConaughey

Superhuman Body is a MacGillivray Freeman film presented by Edwards Lifesciences and Griffin Catalyst. For more information, visit https://superhumanbodyfilm.com/.

About MacGillivray Freeman Films MacGillivray Freeman Films is the world's foremost independent producer and distributor of giant screen 70mm films with more than 45 films for IMAX[®] and giant screen theaters to its credit.

Throughout the company's 50-year history, its films have won numerous international awards including two Academy Award® nominations and three films inducted into the IMAX Hall of Fame, including Everest, the highest grossing giant screen film of all time. MacGillivray Freeman's films are known for their artistry and celebration of science and the natural world. It is the first documentary film company to reach the one-billion-dollar benchmark for worldwide box office.





Understanding and embracing Diversity, Equity, Inclusion and Respect within all educational communities.

By Shelly A. Munoz

In recent years, there has been a commendable surge in efforts to improve Diversity, Equity, and Inclusion (DEI) in educational settings across the nation. Schools and districts are allocating significant resources to foster environments where every student and educator feels valued, respected, and supported regardless of their background. This push for DEI is undoubt-

edly apositive step towards building more inclusive communities, adding value in many ways. However, amidst this progress, there continues to be concerns and a lack of understanding about the value and need for inclusion of different ethnicities, indigenous peoples, and all people of color within many communities across America. **Diversity:** the practice or quality of including and involving people from a wide range of different social, ethnic, cultural, gender, geographic and life experience backgrounds.

Equity: the quality of being fair and impartial.

Respect: due regard for the feelings, wishes, rights, or traditions of others.

It's heartening to witness the commitment of educational institutions towards embracing diversity and creating inclusive spaces. It's equally important to acknowledge that true inclusivity goes beyond mere rhetoric , but necessitates a holistic approach that not only focuses on student diversity but also addresses the inclusivity and support for educators from diverse backgrounds. In the quest to cultivate the next generation of STEM leaders, the movement to recruit 30,000 new STEM teachers by 2030 stands as a beacon of hope.

Amidst this ambitious endeavor lies a critical imperative: the value of diversity. Research consistently underscores the profound positive impact of diverse representation in STEM education, for students and educators alike. Increasing the number of under-represented educators in STEM not only provides crucial role models for students but also brings unique perspectives and experiences into the classroom, enriching the learning environment for all. By prioritizing diversity in recruitment efforts, fostering inclusive learning environments, and providing equitable access to STEM opportunities, we can create a more representative and inclusive STEM workforce that empowers individuals from all walks of life to pursue their passions and contribute to the advancement of STEM fields.

Data concludes a profound impact on students seeing themselves mirrored in their educators, mentors and role models, particularly in STEM fields. Studies have shown that students from underrepresented backgrounds, are more likely to pursue and succeed in STEM careers when they have teachers who shares their cultural, racial or gender identity.

This representation not only fosters a sense of belonging and validation but also serves as a powerful motivator for aspiring young minds. When students witness individuals with shared commonalities thriving in STEM professions, they are more likely to envision themselves pursuing similar paths, breaking down barriers, and challenging stereotypes. Therefore, ensuring a diverse population of educators is not merely about representation but about empowering future generations to explore and excel in fields traditionally represented by a less diverse demographic.



In many un-diverse communities, there is a continuing challenge to understand the importance of and embrace inclusive practices. Change of any kind is usually uncomfortable and adjustments to the classroom environment can be especially challenging. While the intention to diversify the teaching staff is commendable, it remains a goal in many communities and suggests that the need for continuing understanding and inclusion efforts continue. For both students and educators, many challenges remain to be addressed such as social isolation, micro-aggressions, and lack of institutional support. This not only affects a persons well-being but also hampers their ability to effectively as an educator or student.

Placing the burden of including teacher diversity solely on the underserved population without addressing the historical issues within these communities often leads to teacher burnout, disillusionment, and ultimately, attrition.

It's essential to recognize that creating truly inclusive environments requires active participation and commitment from all stakeholders, including administrators, fellow educators, students, and the broader community.

With teen suicide and bullying at epidemic proportions, the urgency for inclusion and respect has never been more critical on campus. To support all underrepresented educators, a comprehensive plan is imperative. This plan should encompass several key components:

Preparation and Support: Prior to joining a community lacking in diversity, educators should receive adequate preparation and support. This includes cultural competency training, mentorship programs, and access to affinity groups where they can find solidarity and support.

2. Institutional Commitment: Educational institutions must demonstrate a genuine commitment to DEI by implementing policies and practices that prioritize equity and inclusivity. This includes establishing clear protocols for addressing instances of discrimination or bias and creating avenues for educators to voice their concerns without fear of reprisal. *3.* Community Engagement: Engaging the broader community in conversations about diversity and inclusion is crucial. This involves fostering dialogue, promoting cultural competency, and actively challenging stereotypes and biases.

A. Retention Strategies: Implementing retention strategies that specifically address the needs of minority educators is essential. This may include offering professional development opportunities, providing qualified access to leadership roles, and creating a supportive work environment that values their contributions.

As we move forward with initiatives such as Grow Your Own and scholarship programs aimed at increasing diversity among educators and supporting students from underrepresented backgrounds, it's essential to prioritize the emotional and often physical and well-being of both educators and students. Here are some strategies to achieve this:

A. Cultural Competency Training:

Provide comprehensive cultural competency training for all educators to ensure they understand and respect the diverse backgrounds and experiences of their students. This training should focus on fostering inclusive classroom environments and addressing any implicit biases.

B. Mentorship and Support Networks: Establish mentorship programs and support networks for educators entering a new cultural environment. Pairing them with experienced mentors who can offer guidance, advice, and emotional support can help ease the transition and navigate potential challenges.

C. Community Engagement: Engage with the local community to build trust and understanding between educators and students from diverse backgrounds and the communities they serve.

Encouraging open dialogue, collaboration, and partnerships can foster mutual respect and support.

D. Safe Spaces: Create safe spaces within schools where students and educators can discuss issues related to diversity, equity, and inclusion openly. These spaces should be facilitated by trained professionals and provide a platform for dialogue, reflection, and support.

E. Policy and Protocol Development: Develop clear policies and protocols to address instances of discrimination, harassment, bulling or bias within educational institutions. Ensure that these policies are communicated effectively to all stakeholders and provide avenues for reporting and resolution.

F. Culturally Relevant Curriculum: Implement culturally relevant curriculum that reflects the diverse backgrounds and experiences of students in their unique community. This includes incorporating diverse perspectives into lesson plans, textbooks, and classroom materials to promote inclusivity and representation.

G. Continuous Evaluation and Improvement: Regularly evaluate the effectiveness of diversity initiatives and programs and make necessary adjustments based on feedback and outcomes. This may include collecting data on student outcomes, retention rates among educators, and overall school climate.

By implementing these strategies and prioritizing the protection and support of both educators and students, we can create inclusive learning environments where all individuals feel valued, respected, and empowered to succeed.

While the presence of minority educators undoubtedly provides valuable representation for students, it's essential to ask at what cost. True representation requires a collective effort to dismantle barriers and create environment where everyone feels safe, seen,



heard, and valued.

In conclusion, the current focus on DEI in education is a laudable endeavor that holds the potential to transform our schools and communities for the better. However, to ensure that these efforts are truly effective and sustainable, it's imperative to prioritize the well-being and support of all educators and students.

By implementing proactive measures to safeguard their interests and creating environments where diversity is not only celebrated but also embraced, we can move closer to realizing the vision of equitable and inclusive education for all.

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The First Step to Closing the STEM Divide: Create a Nurturing and Inclusive Math Classroom

By Odalis Amparo, Professional Learning Specialist at Illustrative Mathematics

As an experienced educator and former instructional math coach, I, like many students I've taught and peers I've encountered, disliked math growing up and struggled to understand it. As a first-generation Dominican American, I entered elementary school without understanding how to speak or read English, which impacted my math performance and left me to believe I was not a "math person." While math is supposed to be a universal language that everyone can understand, I didn't understand the language and context behind the symbols and numbers making it challenging for me to apply those concepts to real-world experiences.

Now more than ever, it's critical for educators to give students equitable access to math, which serves as a pathway to high-paying STEM careers. The U.S. Bureau of Labor Statistics predicts that STEM jobs are expected to grow 10.8% between now and 2032, and there aren't enough workers prepared to fill these critical roles. Women, Black, and Hispanic workers are particularly underrepresented in the STEM field.

Educators can break down barriers to STEM by changing our own math mindsets to effectively change our students'. Rather than viewing math as a hurdle or a subject only some students will grasp, we can connect our math instruction to students' cultural frameworks and give them the skills and confidence to tackle more complex problems.

Here are three ways we can create a positive and supportive learning environment that will help bridge the math divide for our students.

1. Gain a Better Understanding of Students' Prior Learning

When I taught fourth grade, I quickly realized that I wasn't solely responsible



for teaching grade-level content. I had to address any unfinished learning or math concepts students hadn't yet mastered. We expect students to come in and pick up where they left off last year, but we need to give them more opportunities to demonstrate what they know so we can adjust our instruction accordingly.

Before we engage our students in more complex math problems, we need to:

• Take the time to learn about the whole child and their unique points of view.

• Ask questions as students solve problems to get a sense of their mathematical thinking processes.

• If possible, engage in conversations with students' former teachers to better understand their unique learning styles.

• Ensure that students understand how new information builds upon concepts they've already mastered. The National Council of Teachers of Mathematics suggests engaging students in "warm-ups," or simple math routines that prepare them to solve more complex tasks.

• Assess and address gaps in prior learning by looking at grade-level standards and then determining what skills your students need to master their current classwork. Using curriculum adaptation resources, you can modify your instruction for the whole class or small groups by incorporating knowledge and skills from prior grades into your lessons.

2. Create a Positive Math Environment for All

Math should be an exciting subject students want to explore—a joyful experience that helps them better understand the world outside of their textbooks and classrooms. We can all discuss quantities and symbols as long as we are intentional with our language to ensure everyone feels confident and able to join the conversation.

When teaching a new math concept, educators can introduce a problem to students by applying it to something familiar to their lives, for instance, where they shop. You might say, "If your mom gives you \$20 to spend at the bodega down the street, what can you get with it?" When you relate math to a child who shops at a bodega, it provides a more concrete understanding that ties to something real in their life. Then, you can loop in decimals and other concepts, attaching and stamping that learning with an experience they already have.

Additionally, math educators should aim to:

• Provide meaningful, thought-provoking, rich tasks for kids to solve. Use curricula that give students multiple entry points for engaging with the problem.

• Adopt a problem-based teaching and learning cycle, which focuses on developing students' thinking skills and allowing them to build solutions. • Position students as "doers of math," where the teacher serves as a facilitator of experience rather than a knowledge holder. Math Language Routines can provide a framework for students to discuss math concepts and ensure that their discussions offer opportunities for them to learn something new.

3. Recognize Math Anxiety and Look for Ways to Support Affected Students

According to the American Psychological Association, anywhere from 20% to 25% of students experience moderate or high levels of math anxiety, which can persist through adulthood.

Math anxiety often presents as having low confidence with numbers or mathematical concepts or even avoidance. Students may engage in negative selftalk, where they convince themselves they won't be able to solve a problem before they encounter it. Or, they may have difficulty explaining their thinking behind solving a problem or completing a task.

The potential consequences of a child's unaddressed math anxiety can be detrimental and can also prevent them from accessing STEM career opportunities after high school. Students with math anxiety are more prone to avoid



studying or tackling more complex problems, which leads to poor math performance.

Their anxiety around numbers and problem solving then influences the subjects they choose to study in college, keeping them from pursuing technical jobs. In adulthood, individuals with math anxiety may have difficulty budgeting, paying bills, or even measuring for furniture or appliances.

Here are some things you can do as a teacher to help support students who may have math anxiety:

• Be curious about your students don't make assumptions about why a student may be anxious or struggling.

• Monitor your students for typical math anxiety signs and respond accordingly.

• Celebrate all student successes/ wins; this doesn't only mean rewarding accuracy but also meaningful engagement during a task.

• Assure students that success in math is sometimes about something other than the end result. For example, assessments aren't meant to serve as a "gotcha" but instead serve as an opportunity to pinpoint where they need further support.

To truly bridge the math divide and set our students up for academic success, educators need to create inclusive, meaningful opportunities for students. Making math interactive and fun is a start, but we can only truly disrupt how students experience math when we can show them the many ways it exists all around them.

About the author:

Odalis Amparo is a former elementary school teacher and instructional math coach. She is currently a professional learning specialist at Illustrative Mathematics, where she continues to make math a joyful experience for all students.





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