This I Believe

The Struggles, Joys & Motivations of 25 STEM Educators

This I Believe

MICHIGAN STATE UNIVERSITY®

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Teaching Fellowship Program

This I Believe

The Struggles, Joys & Motivations of 25 STEM Educators

MSUrbanSTEM, 2014-2015

Michigan State University

Photos courtsey
Punya Mishra, Kyle Shack, MSU outreach

June 2015

To believe in something, and
not to live it, is dishonest

- Mahatma Gandhi

This book is dedicated to learners everywhere.


TEAMWIT
TEAMWIT

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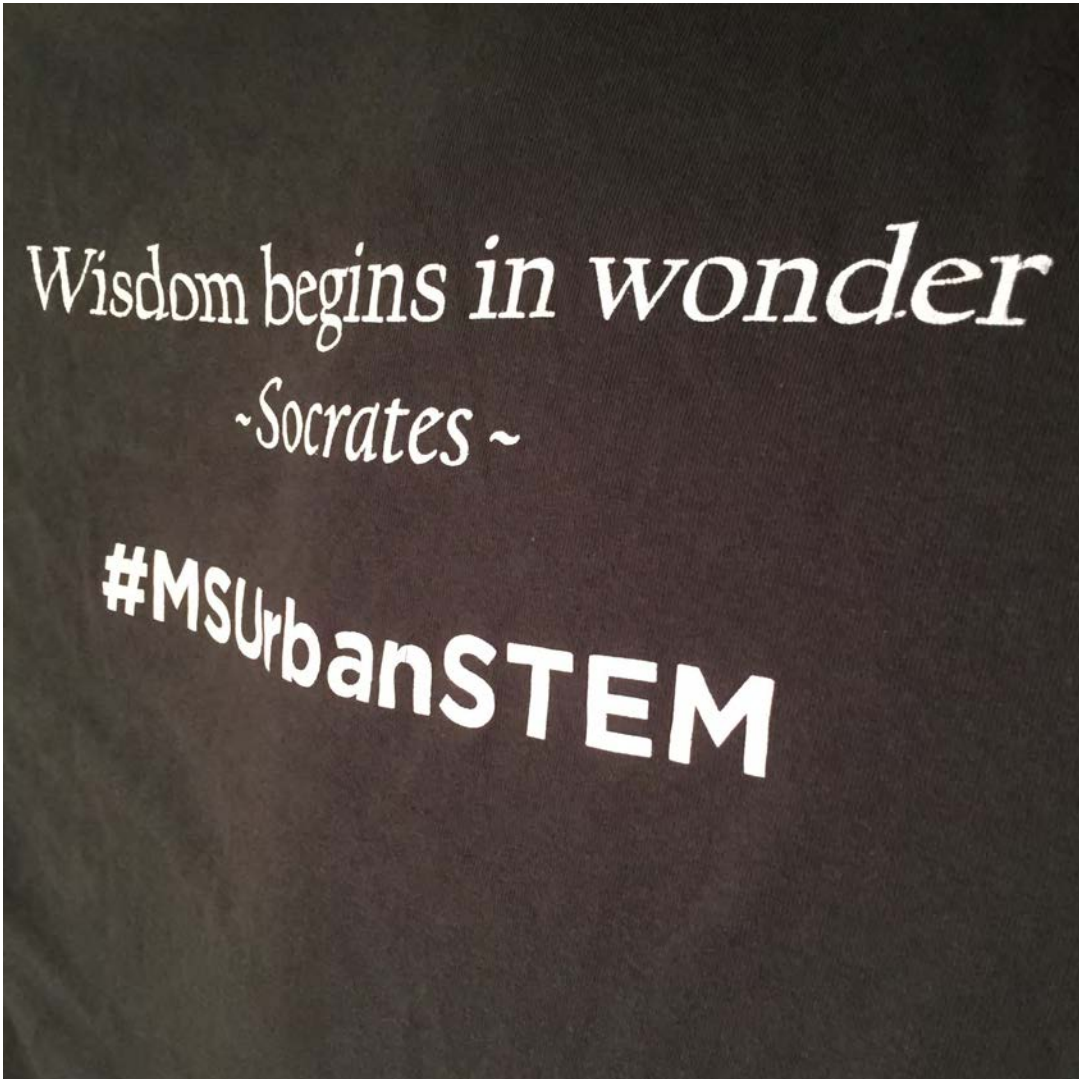
Wisdom begins in wonder
~Socrates~
#MSUrbanSTEM


MICHIGAN
STATE
CAPITAL CITY
RIVER RUN

Preface

In today's ever-changing landscape of public education, educators must be committed to a set of ideals, a foundation that grounds them in what is most important for educating today's youth. Most discussions of public education today tend to focus on policies such as the No Child Left Behind Act of 2001, the implementation (or not) of Common Core State Standards, the rise of standardized testing, or stringent teacher evaluation practices. What is missing in many of these discussions is the critical role played by the teachers. Genuine educators endeavor to focus on student engagement, deep-learning, and application. These educators remain committed to the intricate yet challenging beauty of teaching, seeking to work individually and collaboratively (but always thoughtfully) to educate the whole child. These foundations and beliefs are the very fabric of this book written by 25 STEM educators in the Chicago Public Schools.

For the past year, the 25 educators who are featured in these pages have been engaged in an inventive, integrated year-long graduate certificate experience aimed at building STEM teachers' capacity to lead and inspire innovative practices in urban K-12 schools. They were selected by the *College of Education* at *Michigan State University* through a rigorous process based on criteria that included a commitment to teaching in urban schools, deep knowledge of content, and prior achievement and evidence of promise in the field. This book is the culmination of their year-long experience described in their own words. Through their writing, our leaders share works and ideas that have inspired their educational thought as well as challenged their way of thinking about the nature of leadership in their disciplines.

We are excited to share this diverse collection of thoughtful, inspiring statements. In which, they look back—reflecting on a rewarding yet challenging career as well as the past year; and look forward—to an exciting future, seeking to reinvent themselves as educators and leaders. In addition, in their chapters, they tell us about a book that inspired them, a quote that drives them, and, for those who want to know more about their work, they provide links to their websites and twitter accounts. Finally, they draw on their experiences from the past year and—taking a page from the NPR playbook—conclude with a response to the prompt "This I Believe..." Thus, these 25 articles by these exemplary teacher-leaders can serve as both a resource and inspiration to those seeking to follow in their footsteps.

As you peruse the pages of this book, it is our sincere hope that you are inspired by the passion that emanates from each fellow's words. At the core of it all is a genuine love for students, the STEM disciplines, the art of teaching and learning, and vision for the future of education.

Enjoy!

Acknowledgements

This book (and the program that helped create it) is the result of the hard work and effort of a large team of people. First and foremost, none of this would have been possible without the generous support of Wipro Ltd. and their commitment to education in the STEM disciplines, particularly in urban districts such as Chicago. We would specifically like to thank Anurag Behar of Wipro and the Azim Premji Foundation for his efforts in making this project a reality.

We are also grateful to Microsoft for their donation of Surface Pro tablets for the first and the second cohorts of teachers in our program. A special thanks to Dr. Jim Ptaszynski, and Jacqueline Russell helping make this happen.

We would also like to thank Chicago Public Schools for their partnership. In particular we would like to mention Aarti Dhupelia, Chief Officer of College and Career Success; Dakota Pawlicki, Director of Strategic Partnerships and Projects; Litrea Hunter, Chicago based recruitment and sustainability coordinator; and Lana Brown, outreach specialist. This has been a genuine partnership between MSU and CPS and these individuals are among many who have made this possible.

There are numerous people at Michigan State University and the College of Education (too numerous to mention) who have helped in ways large and small in making this project a reality. We would like to specifically thank Dean Don Heller for his support, Marcy Wallace for helping navigate the intricacies of budgets and other red-tape, and Jessica Pham and Heather Johnson for administrative support.

The planning, technology, and evaluation team at MSU consisted of (in alphabetical order) Inese Berzina-Pitcher, Rohit Mehta, and Christopher Seals. This book was the brain-child of Punya Mishra and the instructional team, which includes Missy Cosby, Akesha Horton, Candace Marcotte, Rohit Mehta, and Kyle Shack. Rohit Mehta took the lead in providing feedback and shepherding the writing process, cleaning up and organizing all the documents in consistent form. Thanks also to Jonah Magar, Expresso Book Machine coordinator at MSU Libraries, for helping with the printing process. The book was was designed by Punya

Mishra. We would also like to thank the leadership team at MSU: Dr. Punya Mishra, Dr. Sonya Gunnings-Moton and Dr. Leigh Graves Wolf. Their commitment to excellence in teaching in general, and to urban education in specific, can be felt in every aspect of the program.

Finally, a heartfelt thanks to the 25 teachers who are the first cohort of the 2014-15 MSU-Wipro Urban STEM Teaching and Leadership fellows. This project runs on their shoulders. The 25 reflections in this book are testimony to their creativity, passion, and concern for excellence in STEM learning. They often work in challenging contexts with multiple pressures on their time and energy. It has been our privilege to work with them and learn from them and we thank them for giving us this opportunity.

Sincerely

The MSU-Wipro Urban STEM Fellowship 2014 Teaching Team
(Punya Mishra, Missy Cosby, Akesha Horton, Candace Marcotte, Rohit Mehta & Kyle Shack)

June 2015, East Lansing MI

Additional resources related to this book
and the project can be found at
msuurbanstem.org


FAILURE
IS NOT AN
is the only...
OPTION

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This I Believe


DePAUL
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Manuel Acevedo

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As a technology teacher, tech coordinator, and former math teacher and coach, Manuel Acevedo values the time he spends with students, parents, and with teachers in their classrooms. He is passionate about providing a creative and active learning school environment that promotes the importance of a STEM education in everyone's lives. He supports teaching and learning that involves collaborating, planning and discussing best practices. This focal point has helped him create a school environment where every student can learn and enjoy STEM subjects

> You can discover more about a person in an hour of play than in a year of conversation - Plato

Recommended Reading

The Design of Everyday Things by *Don Norman.*

The Design of Everyday Things with its stages, processes, and human-centered design philosophy has accentuated the "E' in my STEM instruction. His book is engaging for all types of readers whether technical people, designers, non-designers or just everyone else. The author's goals are for everyone to become great observers of design, to find technology, which is usable and understandable and to fix those designs that do not work. His design principles are based on psychology, human cognition, emotion, action, and interaction with the world. He discusses the important characteristics of good design, leaving us with a greater understanding of what is happening in the design world.

The past, the present, the future

Throughout my 25-year educational career, at both the university, elementary and middle school level, I have promoted academic achievement, broadened students' interest, and supported students and their families with their educational goals. As a Northwest Middle School technology teacher, technology coordinator, and former math teacher and coach, I am passionate in providing instruction, which promotes, supports and enhances the science, technology, engineering, and math disciplines. This focal point enables me to create a school environment where every student can learn and enjoy STEM learning. It is vital my students are exposed to academic programs that have regular instruction, which promotes STEM connections and provides hands-on activities. Therefore, I strive to create and provide my students with well thought-out instructional opportunities with appropriate academic and digital resources.

Educational objectives should always be the focus of instruction. It is paramount and any resources utilized must not distract from that focus. Technology, along with other resources, ought to be viewed on how it can help enhance instruction and student learning and not be appropriated solely because it is available. Consequently, I am a missional thinker where academic plans are created to motivate students and teachers on how STEM instruction can assist in engaging and motivating student learning and how STEM activities can engage students so that they immerse themselves into academic disciplines and become problem solvers.

There are often moments when students and teachers alike have reflected on how certain devices are put together and how they work. My MSUrbanSTEM Dream IT Reverse Engineering project

with the Dyson vacuum and turbine heads has engaged students in discovering answers and expanding those questions. My project enabled students to be free to fail and allow their curiosity to be nurtured. Next school year, I look forward to expanding my Dream IT project to include activities such as reverse engineering alarm clocks, toasters, tablets and other everyday devices. Additionally, I will pursue STEM endeavors – such as wearable electronics, Squishy Circuits, Makers Lab and 3D printing – to engage students in creating and fostering their own curiosities. My long term goal is to promote school-wide STEM instruction.

Engaging my students in the reverse engineering process has emphasized that when they are able to work with their hands it helps them focus their natural curiosity and provides them a working knowledge on how devices are created, designed and function. Students build on their STEM knowledge when they can touch, take part and reassemble devices. It enables them to have fun, engaging, and meaningful academic discussions.

I am passionate about providing a creative and active learning school environment that promotes the importance of a STEM education. I support teaching and learning that involves collaborating, planning, and discussing best practices; and I will continue to create more opportunities in which every student, teacher and parent can grasp and appreciate STEM connections. I envision my school community going beyond any educational standards, being free to experiment, take risks, make mistakes, and not let a lack of confidence or know-how imperil their ability to learn and have fun in the core science, technology, engineering, or math disciplines. I strive to provide a wide-range of learning opportunities including taking devices apart and exploring what is inside and creating unique devices. As a result, the entire school community will identify with and appreciate STEM subjects throughout their academic years, occupations and lives.

This I believe...

... I am committed to the important mission of teaching and helping develop all students. A commitment that is best accomplished by creating a philosophy, strategy and course of action with students, teachers, parents that translates into the entire school community building on their learning that goes beyond academic standards in a creative, positive, and constructive academic environment.

Manuel Acevedo


Surface

Rosalind Ali

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Rosalind Ali is a middle-grades Math and Algebra teacher in the Chicago Public School system. She holds a B.S. degree in Computer Science from the University of Detroit-Mercy and an M.S. degree in Education from Indiana University-Indianapolis. Rosalind began her professional career in the IT industry. Seeking new and exciting challenges, she earned teaching credentials at the University of Illinois-Chicago and just completed her 13th year as an educator. She is passionate about presenting engaging STEM content to students and providing a foundation for students to pursue STEM careers.

> Every day, learn something new, and share it with those around you - Dr. Lorraine Monroe

Recommended Reading

Teach Like Your Hair's on Fire: The Methods and Madness Inside Room 56 by *Rafe Esquith.*

I remember being a new teacher and looking for help with classroom discipline, motivating activities and teaching life skills. Ms. Esquith presents all this and more in this book. This book is chock-full of ideas and strategies that will engage your students and enliven your classroom. It's full of useful tips that you can implement the next day and many of the examples presented and be modified to fit any discipline or content area.

The past, the present, the future

I began my professional career as a computer programmer and enjoyed working with technology and contributing to the inner workings of a corporate organization. As the years went on I began to look for new challenges and more opportunities to work with young people and stumbled upon an opportunity to earn education certification credentials for non-education majors. Although I never seriously considered a career in education, becoming an educator has been the most rewarding decision I've made.

Both of my parents worked in the public school system and my only sibling is a teacher, so my childhood memories and dinner table discussions usually circled back to classroom experiences. I spent many hours in schools with my Dad (a retired principal) and Mom (a retired nursing educator) so schools have always felt like home to me. I was probably always destined to be an educator because I enjoy learning and helping others, especially children.

When I first started the program, I was at my wits end, really struggling to reach and engage all of my students. It had been a tough year for me having to watch five of my brightest students go to summer school for grades, while their standardized test scores clearly demonstrated their ability to perform above grade level. I realized my instructional methods could not compete with the offerings of the inner-city streets and I was desperately looking for ways to make my classroom more engaging.

Participating in the MSUrbanSTEM Fellowship Program has given me a better understanding of how to use technology in the classroom. Before this program my students would use computers in the classroom mainly for online practice and research. Now, they're using technology for communicating, sharing, exploring,

creating, inventing—I've seen technology transform all aspects of my instruction. Student engagement has increased in the classroom and I'm committed to using technology to move students toward increased engagement outside of school and full-time learning.

After many years in the information technology, my teaching career allowed me to take a break from the ever-changing world of hardware and software. Being in this program has revitalized my love of technology and computer science and I feel lucky to be in a position to present digital learning activities to my students. I firmly believe that building students' capacity with digital tools will strengthen their confidence and lay the foundation for their interest and success in pursuing STEM careers.

Looking forward, I intend to continue serving in a teacher leadership capacity, serving on my school's Instructional Leadership Team and working as a mentor teacher for my network. I also applied to be a Consulting Teacher for Chicago Public Schools and am excited by the possibility of working with other teachers to have a greater impact closing the achievement gap and sharing with other teachers how technology can be used to transform education.

Next year, I intend to increase the use of technology in all phases of instruction and aim for every student to create a digital portfolio to showcase assignments and projects for all of their classes. This year, it became clear to me that the challenge for my school and others in impoverished communities is access. While we may have made progress in closing the "digital divide", there still exists a "digital access gap". This gap exists where schools are limited to the once-a-week computer lab schedule or hundreds of students share a single 30-unit iPad cart. My goal is to help my school achieve one-to-one technology access, securing funding through grants and applying for programs to acquire additional technology devices.

My ideal job would be one where I can teach STEM content, coach others around the use of technology, and plan and execute field experiences so students are exposed to real world implementation of the STEM content they're learning in the classroom. Imagine students studying ecosystem processes and then traveling to Arizona to visit the Biosphere 2 campus. Think of all the real-world connections and learning that could occur on a field experience like that! The possibilities for exposing students to people and places beyond their everyday surroundings are endless.

This I believe...

... students are more engaged through exploration, by doing not just hearing.

... being an educator is a commitment to being a lifelong learner.

Rosalind Ai


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Mahesh Alur

Mahesh has been a teacher for 11 years. He just completed his third year at Amundsen High School in Chicago's Bowmanville neighborhood (Go, Vikings!). He taught International Baccalaureate (IB) Biology, Chemistry, and Exploring Computer Science. Before coming to Amundsen, he taught for one year in Indianapolis, Indiana, and in two other public schools in Chicago, Illinois.

He studied Molecular and Cancer Biology at Northwestern University where he received his PhD in 2006. He also attended the University of California-Davis where he received a BS in Biochemistry in 1996.

Currently, he lives in Chicago's Uptown neighborhood with his wife, son, and two cats. In his free time, he enjoys spending time with his family and reading (currently, "Seveneves" and "Deep Down Dark"), among other pursuits.

Tell me and I forget, teach me and I may remember, involve me and I learn - Benjamin Franklin.

Recommended Reading

Flip Your Classroom: Reach Every Student in Every Class Every Day by *Jonathan Bergmann & Aaron Sams.*

This book is a practical "how to" guide to flipping one's classroom. It is a great place to start because the authors describe what to do and what not to do in clear prose. The book is a very quick and easy read. If you are like me, you will want to start "flipping" your class after you finish reading this.

The past, the present, the future

I became a teacher because I wanted a career where my skills and passion matched the daily requirements of the profession. While attending graduate school, I tutored with a program called HighSight, which provides scholarships and support for low-income students to go to private schools. Working with these young people gave me focus and helped me learn about the path that my life should take. After three years working with Highsight, I applied and was accepted to Teach for America.

This year, being an MSUrbanSTEM fellow has allowed me to explore new tools to teach and reach every student. Having students explore existing knowledge or create new knowledge using technology has been an eye-opening experience for me. I see how this could be a transformative experience for students, because they are learning technological skills, social skills, and science content simultaneously.

Both the learning material that is delivered to students and the method in which it is presented are critical in the classroom. Often, one can become lost in curricular content and forget appropriate strategies for the adolescent learner. After all, adolescents are relatively new to this learning business. As teachers, our minds are fully formed and our notions of how to learn are cast in stone, relatively speaking.

This summer, I look forward to reexamining the strategies and rationale behind activities and utilizing these new tools that heighten the intellectual and social components in my classes. Students will be learning how to manage their own intellectual and emotional behaviors, and I, as their teacher, will be guiding them as to how to make it possible. While building relationships, I gradually will be implementing structures that introduce higher order thinking so that the truly tough gains become possible.

This I believe...

... awakening excitement for learning is our mission, our purpose and our goal, not only for teacher and student, but also for the entire community seeking to reap the full benefits of education.

MAHESH ALLR

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RJ is an 8th Grade Middle School Science Educator at Marvin Camras Children's Engineering Elementary School. He has been with the Chicago Public Schools for 14 years in various grade-levels and coaching positions. When not in the classroom, RJ can be found at the gym, eating, learning, laughing, watching sports, at a museum, shopping, in New York City, and/or enjoying live theater. More likely than not, he is probably enjoying live theater since RJ has been to all the Broadway houses in New York City, multiple times! If you ever need a recommendation, tweet him.

Careful the things you say / Children will listen / Careful the things you do / Children will see and learn / Children will look to you / For which way to turn, / To learn what to be / Careful before you say, / "Listen to me" / Children will listen / Children Will Listen - Stephen Sondheim

Recommended Reading

Eureka! Discovering Your Inner Scientists by *Chad Orzel*

Eureka is a book that argues deep down we are all scientists, since we are naturally curious beings. Our curiosity begins at birth as we attempt to make sense of our world and hopefully it continues throughout our lives when we ask how and why. The world's greatest discoveries began with questions from curious people. This is an important lesson to impart on students that they should never stop asking questions and continue to explore their curiosity.

The past, the present, the future

The teaching bug bit me early, when I was in middle school, working at the Neighborhood Boys & Girls Club (NBGC), instructing children on playing sports like baseball, basketball, floor hockey, and football. I continued to work there throughout high school. I felt a comfort and an ease teaching these kids how to swing a bat, make a tackle, hit a slap shot, and shoot a free throw. As a result of my six years with NBGC, I knew I wanted to work with children. I also knew that I was not Mike Ditka or Phil Jackson so coaching was probably out of the question. I felt transitioning into an elementary education program would be a logical next step. My great work experience with the NBGC taught me patience, commitment, and responsibility, which are values that I hold closely today.

This has been a year of change for me not only professionally, but also physically (See HOT picture above…HA!!!) After teaching 6th grade for four years, I was moved to 8th grade. I finally felt in command and comfort with the 6th grade curriculum and content. I felt like a student again learning a lot of new material in a short amount of time. I stuck to this new curriculum and pacing guide as if it was the Holy Grail. In 6th grade, I modified a number of the activities to best meet the needs of our students. Since I was learning this new curriculum along with the students, I felt I did not modify as much because I did not know what worked and did not work. In the end, I thought the students and I persevered despite some bumps in the roads. It was very much a learning experience for all of us this year.

In terms of leadership, I believe I took a huge step forward this year. As a Next Generation Science Standards (NGSS) Collaborative Teacher Leader, I have been in-serviced on the Science and Engineering Practices (SEPs) and the Crosscutting Concepts. I have taken the knowledge gained from those experiences to lead a teach-

back session to our Science Priority Team on the SEPs. From that teach back session, it was the responsibility of other priority team members to take back the information that I presented to conduct their own teach-back to their grade-level band like I did for our middle school Science team. Through this teach back session, I was able to influence the course of action for our Science Priority Team along with providing our school with a school-wide Science focus.

As I gaze into the future, I foresee myself incorporating more Engineering and Technology into the curriculum. For Engineering, we have Project Lead the Way, which is an engaging and hands-on curriculum for middle school students. This summer I intend to review each kit and align it to one of our curriculum's unit. In terms of Technology, I will be participating in the second cohort of Code.org, which is a Computer Science programming curriculum for middle school students, which is aligned to our current curriculum. Professionally, I intend to begin my National Board Certification renewal process since I have only two years remaining. In the leadership domain, I will continue to attend the NGSS Collaborative professional development sessions, and lead teach-back sessions to our Science Priority Team on the Crosscutting Concepts, and then the Disciplinary Core Ideas.

This I believe...

... children will listen.

... educating the entire child.

... encouraging and exploring our curiosities.

Rolando Argumedo, JR.

Leslie Armstrong

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he last day of the summer of Urban STEM was the first day Leslie began to speak with a new message and started to believe that she truly is Leslie Armstrong. She has become more than just the19 years of service as an educator. She believes that she can now confidently represent the title of STEM coach at Laura S. Ward. An integral part of this difference of thought and habits, according to her, was fuelled by reading the books she recommends below. Artifacts of her Urban STEM transformation can be found at her webiste (www.chiwest11.com).

> You must be the change you wish to see in the world - Mahatma Gandhi

Recommended Reading

Rocking the boat by *Debra Meyerson*; Seven Characteristics of Highly Effective People by *Steven Covey*; and Rhythm of Math by *Crosspulse Media*

Rocking the Boat is an incredible text to immerse individuals that wish to make metered or radical change. The inclusion of the stories about people that endeavor to lead paints streaks of realism that complement the palate of revolution.

The past the present the future

I am at the end of the road, but standing at the initial point of reconstruction of a demolished highway. Highways are composed of layers and are laid out in stages. Careful planning and forethought is needed in the undertaking of joining arteries and capillaries that connect to the heart of our country. This heart is represented by our children; the 21st century acolytes that must be ultimately prepared to sing a song of innovation. Spiraling back to the point at which I stand, the Wipro Urban STEM experience has been an architect of change. The process represents layers of mandated self-reliance, the compulsory push to collaborate, the obligation to infuse self, the requirement of persistent reflection and finally required focused revision. These layers make up what I am now and what I temperedly express to anyone I encounter professionally and personally. The building of highways enabled freedom of movement and the ability to explore. I too share in this freedom to utilize tempered radicalism to cause metered and abrupt change. Syntactical STEMulation is the mind-altering set of procedures that I have begun to institute modular transformation in self and teaching pedagogy. Independent exploration of the tools of technology, precise surveying to identify windows of opportunity, building collaborative networks and intensive preparation before action are the surgical instruments of this process.

The following quote exemplifies and summarizes my experience as a participant in the WIPRO Urban STEM Experience.

This I believe...

... The only way that we can live, is if we grow. The only way that we can grow is if we change. The only way that we can change is if we learn. The only way we can learn is if we are exposed. And the only way that we can become exposed is if we throw ourselves out into the open. Do it. Throw yourself- C. JoyBell C

Leslie Armstrong

Bellasanta O. Belen-Ferrer

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A native of the Philippines, Bellasanta Ferrer, was a former geologist turned full-time homemaker, then teacher and research coordinator at the Ateneo de Manila University (ADMU) Grade School Department, before coming to the U.S. for graduate studies in 2001. She became a Chicago Public Schools teacher through the AUSL program in 2003 and served as a school-based mathematics and/or science lead teacher from 2003 to 2012. Currently, Bellasanta is a middle school mathematics and science teacher at Haines School in Chinatown, Chicago.

Bellasanta has been privileged to receive scholarships and grants to complete degrees, certificates, and programs that provided her with content and pedagogical skills. She combines her life-long passion for learning, the arts, and her Ph.D. in research methodology training to lead Haines School's transition to the NGSS through STEM, supported by research and enhanced by the Arts (STrEaM).

> Who dares to teach must never cease to learn - John Cotton Dana

Recommended Reading

Math Girls by *Hiroshi Yuki*

Read Math Girls if you want to know how students could have fun as they talk about new and old solutions to math problems outside the prescribed math curriculum. To hook students in mathematics, it is important to find fun ways to learn, basic or advanced mathematical concepts and skills from calculus to abstract algebra and beyond. Math Girls' short vignettes format and its manga version will appeal to a wide variety of readers.

The past, the present, the future

I started working as a geologist in the Philippines after graduating college in 1977 and passing the board exams, at age 19. From 1980-1990 I became a fulltime homemaker until our two sons were of school age. The need to understand the challenges that my older son was experiencing in school compelled me to make a shift from being a scientist, to becoming an educator of young minds. In 1991, I was hired as a 5th-grade Science, Reading, and Filipino teacher. I then requested to be a full time mathematics teacher so I could better address the observed needs of my students in basic mathematical concepts and skills. From 1995-2001, I also taught 5th- and 6th-graders in the Mathematically Advanced Group Instructional Scheme (MAGIS) program. I collaborated with mathematics educators from Auckland University and ADMU in my action research on how 5th-graders estimate area of irregularly-shaped figures and facilitated a "Technology in the mathematics classroom" workshop at the 1999 Southeast Asian Conference on Mathematics Education. This collaborative action research was published in the NCTM's 2001 Teaching Mathematics in the Middle School journal. I was the head of our school's Research and Program Development and Evaluation Center before coming to the U.S. for graduate studies in 2001.

The past year as an MSUrbanSTEM fellow supported my life-long passion for learning and gave me the confidence to be flexible in order to modify how I teach, to engage more students and to meet their needs. This fellowship showed me why and how technology should be leveraged to realize STEM education transformation. Aside from technology, this fellowship also inspired me to explore ways on how to integrate art, media, social media, and research in STEM. Instead of the usual end of the unit test, my 8th-graders wrote and recorded a rap on what they learned about matter and created

their own CD jacket. To show understanding of energy transfers and transformations, students in teams designed, built, tested, and raced a solar-powered car. To show their understanding of force and motion concepts and safety features of cars, each student designed and built the safest paper car that will protect a raw egg passenger during a simulated head-on collision. My colleague was impressed about how my students would talk about researching authentic questions they want answered as part of our daily World of Wonder presentations.

"Preparing students for successful and sustainable career...is central to my work as a teacher in general and as a STEM...educator in particular."

Thus, I plan to find and use all available and known resources about STEM content, ideas, misconceptions, pedagogy, and strategies including use of technology. The what, why, and how of problem-based and blended learning would be among the topics that I need to work on as part of our school's academic program.

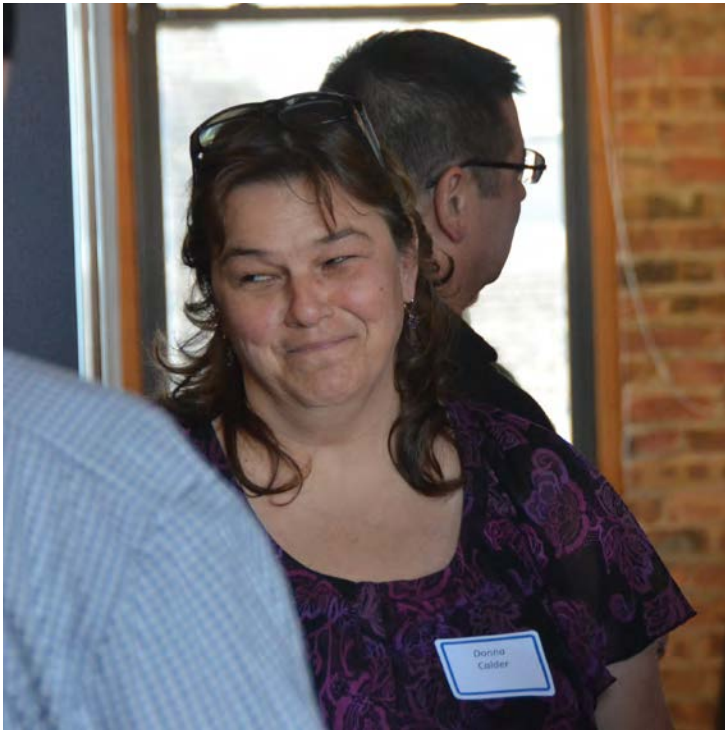
Networking and collaborating with colleagues, attending and presenting at national conferences, within and outside our school and the U.S. is also part of the plan of building my capacity as a STEM/STrEaM educator and leader. Engaging in discussion and collaboration is also necessary to acquire and implement new ideas and learning.

To ensure that STEM is given prominence and status, the level of STEM literacy in our school and community could be increased through fun and engaging activities and projects. I am likewise committed to strengthening and building the STEM pipeline of learners from PK into higher education for the benefit of a more sustainable global world.

This I believe...

...that STEM, enhanced by the Arts and multimedia, mediated by social media, and supported by Research (STrEaM), can help inspire the youth to become informed and scientifically literate citizens to lead world-changing initiatives.

Bellasanta Ferrer


Dorina
Calder

Donna Calder

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As an educator at Wadsworth STEM for the last two years, Donna has been teaching Pre-K through eighth grade science laboratory. Here, students experience inquiry-based hands-on exploration that encourages high-order thinking skills and problem solving opportunities. The new information obtained allows students to make connections to real world experiences. This year as a welcoming STEM school, Wadsworth has opened up an innovation Lab for grades 5-8. This new way of learning is in its transitioning stage. Students are more in control of their own learning with facilitators that guide the instruction. Here, Donna also teaches technology to the kindergarten and first grade, and science laboratory to the 2-4 grade students. She has been teaching for the last 10 years in urban schools as a second career in her years of work.

Education is for improving the lives of others and for leaving your community and the world better than you found it - Marian Wright Edelman

Recommended Reading

Big Questions from Little People: And Simple Answers from Great Minds, Compiled by *Gemma Elwin Harris*

Big Questions from Little People: And Simple Answers from Great Minds is naturally real. In so many aspects it enlightens the adult to enter a child's mind. It is written in such a fun whimsical way that it makes you want to keep on reading. Questioning is something so natural for little people. As adults we sometimes lose sight of that innate innocence that we all once had. This informative collection of children's questions is a must read for all ages.

The past, the present, the future

Since I started officially teaching late in life I was extremely excited to jump in to my new profession. I landed a job on the far south side of the city as a science laboratory teacher for grades K-4. This position was entirely unexpected but very interesting. Students were scoring in the low 20 percentile in science at the fourth grade. I had a lot of work to do. The teacher I was replacing mid-year wrote her own curriculum. I had been studying for a math position. I had taken science classes, but it was not my strongest.

Well, I loved it. My excitement exploded on to my students. It was a very good thing that the laboratory was located in an underutilized wing of the school because the room was loud with instruction and learning as students were using hands-on materials to problem-solve. The greatest obstacle was classroom management. I devised a schedule for all students to have certain jobs for the month and then rotated based off of the animal at their seat. Each table had four different animals; for example: every group had a reptile, amphibian, mammal, and a bird, so students were also learning animal classification.

I sought out all the science professional development available. I did not realize how amazing the leadership was at the school. She was harsh at times and had very high expectations. I did not mind because she never bothered me. I did not fall into the trap of teacher gossip. I did all of what was expected and more. Primary/Intermediate science fairs flourished. Scores began to rise within two years students were at the 54 percentile in science.

After participating in the MSU Wipro Urban STEM Leadership program, I have explored many technology tools that I use in the classroom. I was not very confident in using new technology. Now,

I have no problem exploring different technologies, creating lessons and sharing with my colleagues.

Students were able to explore Google products during the creation of their science fair projects. The students created Word documents, PowerPoint presentations, data graphs in Excel, and saved their work in their Google Drive accounts. Students were excited to learn these tools and be able to access them anywhere they could retrieve using the internet. However, I would have liked more continuity in this process to keep the students motivated.

Mid-year, the new innovation lab opened which is a whole new way of learning and teaching. As a facilitator, I have developed many skills throughout the year participating in the MSU Wipro STEM fellowship required to be prepared to guide students as they take ownership in their learning through creative processes.

The network of teachers that participated in the MSU program have varied expertise from all over the city. This experience has been incredibly inspiring and has worked as a foundation of support to develop what STEM looks like in the classroom and schools. When we gather during the year we share our experiences, whether they are successes or failures.

I am looking forward to continue my education with MSU in the MAET program so that I learn and produce more great resources to share with my students and colleagues. The underlying spark I had for science has now evolved into STEM education. Let's change the look of a classroom and guide students to a new way of thinking. Through creativity, disciplines will be intertwined with depth providing students with opportunities to problem-solving with successes and failures that can shift to other situations.

I will encourage the importance of teamwork at all levels in the school. We are in this together to produce a generation of students that can solve problems, make connections, and transfer concepts from different disciplines. With this missional goal we can make a difference in these lower performing schools.

I believe that a well-rounded education involves not only the school of great leaders and educators, but the community and the local businesses. It is proven that the triangle is the strongest shape. Just as anything, for example a business needs to change and adjust to the current times. School officials and the stakeholders need to be flexible to the current demands of the times.

Through my experiences, in the urban environment the need for basic family morals and values are overlooked. We have created a generation of people that receive without earnest hard work. Nor do our families and students take ownership for the services received. Parents are not educated in the civil responsibility that it takes not only to be a parent but a citizen of the USA.

This I believe...

... let's stop looking for excuses for who to blame for these low performing schools. Through leadership and partnership, let's be creative in our approach to educate our society.

Donna Calder

William Campillo

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As a high school student, William's goal was to graduate and get a ten dollar per hour factory job. After some unexpected life events and chance encounters, he enrolled as a student at the University of Illinois in the school of art and design. After fifteen years working at various jobs in visual and graphic arts, among a host of other experiences, life events opened up an opportunity for him to work in Chicago Public Schools. Eventually, William became a teacher and has not looked back since.

"Education is not preparation for life; education is life itself - John Dewey

Recommended Reading

A Certain Ambiguity by *Gaurav Suri & Hartosh Singh Bal.*

After reading this book you will have a greater appreciation for mathematics as an academic discipline, as an art form, and as the elusive object of many quests for truth and meaning in life. The fact that this book is able to make parallels to religion and philosophy drives home this point even further. For those who love mathematics and those who can appreciate a good story with a rewarding outcome A Certain Ambiguity is a book that will satisfy at both levels.

The past, the present, the future

I spent the last year working as Mathematics coach in a Chicago Public School. The year before, I was coordinator of an IB program and before that a teacher in an IB program. Every three or four years I have tried to work in a different capacity within Chicago Public Schools mostly out of curiosity about how things work. I followed my curiosity in exploring science themes and before that it was trying to understand mathematical ideas. For a while I immersed myself in children's and adolescent literature.

I have always been curious but never really felt that my school experience nurtured that curiosity. When reflecting on my years as an elementary school student, I can't recall ever being excited to learn about anything. I don't remember wondering about the world. I never had an attachment to school and could not name a favorite or influential teacher. In every school I've been in I see so many students that are in that same state. I wish I could find a way to unlock the curiosity in those minds.

Teaching has been a continuous learning experience, although a very challenging one. The best thing about being a teacher is that you are constantly being presented with opportunities to learn. I have taken advantage of these offers, trying to stay involved with some kind of learning experience over the years. Last year I had the great fortune of being selected for the Michigan State University Urban STEM and leadership program (MSUrbanSTEM).

The collegiality I felt during the summer session inspired the idea of creating a professional learning community to study the tasks involved in teaching and learning. I envisioned teachers creating units of instruction focused on core concepts and connected to real world events. This did not happen as planned but it made me check

my own understanding of these concepts. The big take away here is that I am still undergoing a development of these concepts along with pretty much everything else I think I know. A year ago, I could not have fully accepted this idea. This learning experience focused on the relationship between me as learner and as teacher more than any other I have ever had. From this point on I will always think of myself as a learner first, allowing myself to make mistakes and grow from them.

At the end of the year I was introduced to the idea of the personal MBA - the idea that you can create your own advanced degree program through a process of deciding what you want to learn and identifying the books and resources you need to reach that goal. It was fitting because I felt that my learning was just beginning even though the program was coming to an end.

As I see what my MSUrbanSTEM colleagues are accomplishing I feel inspired to learn more about mathematics, the sciences, and engineering, I've been affected by this whole experience and I want to share this inspiration with my co-workers. I want to preach the importance of seeing oneself primarily as a learner and the school as a community of learners. Students, parents, teachers, and administrators with the same hunger for knowledge. I would like to bring important, relevant topics into classrooms as problems for students to ponder and act on. I want students to see themselves as problem solvers who address real world issues in their environment and understand that they are vital to the growth and development of their own community.

This I believe...

... when we discuss what the purpose of education should be, we must think about how it will serve each student, how it will help to empower the underprivileged, and how it will contribute to the creation of a fair and just society that values the welfare and development of every human being.

William Campillo


(SUCCESS)
Amnes
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nking

Kevin Cram

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Kevin has taught Chemistry in Chicago Public Schools for seven years. He earned a B.A. in Chemistry from Michigan State University, an M.S. in Chemistry from Purdue University, an M.A. in Teaching from Dominican University, and is a 2008 alumni of the Chicago Teaching Fellows alternative certification program. Kevin was a part of the 2012-2013 cohort of Teach Plus teaching policy fellows from Chicago, focusing on teacher evaluation and professional development. He has received grants and awards from NASA, Apple, and the American Chemical Society to help improve the educational experiences of his science students. He currently teaches honors and AP chemistry at Lake View High school in Chicago.

Experience is simply the name we give our mistakes - Oscar Wilde

Recommended Reading

The Disappearing Spoon by *Sam Kean*.

Sam Kean's book The Disappearing Spoon is written for scientists, non-scientists, and everyone in between who wants to experience the history and lore behind the main characters of the periodic table: the elements. Kean's writing style draws readers into the mysterious, dangerous, or hidden backstory of all 118 elements by using short but impactful tales of discovery, disaster, or applications of a specific element.

The past, the present, the future

I vividly remember feeling like a failure in graduate school. My research project was not well defined and produced erratic, inconsistent data that made me question my lab skills. I often felt alone and did not receive the necessary guidance and feedback on how to improve my results. The only time I felt confident and truly happy with my science practice was for three hours, one day each week as a teaching assistant for general chemistry students. These three hours in the lab let me share my experience with chemistry tools and concepts, demonstrate how to collect data, and coach students to succeed when they initially failed. I did not recognize it then, but now I realize that I have become what I did not have then: a chemistry coach. Today I bring this mindset with me to work every day as a high school chemistry teacher. I coach my students to confront their struggles and persevere when they feel like failures.

I just completed my seventh year teaching in CPS and fourth year teaching at Lake View High School. Since arriving at Lake View, I have actively demonstrated the need for constant improvement with my teaching practice. Majority of my efforts in past years did not involve me sharing ideas with peers; and when I did, they were often met with resistance. I fell into a modality of what author Debra Meyerson describes in her book Rocking The Boat as "resisting quietly and staying true to one's self"; until this year. This year I was selected as a member of my school's Instructional Leadership Team and now I have a defined voice at my school. With this team, I have worked on building a culture of collaboration with the entire staff, analyzed school data to find academic areas for student improvement, and facilitated multiple professional development meetings for staff. For next several years we will work towards improving student outcome

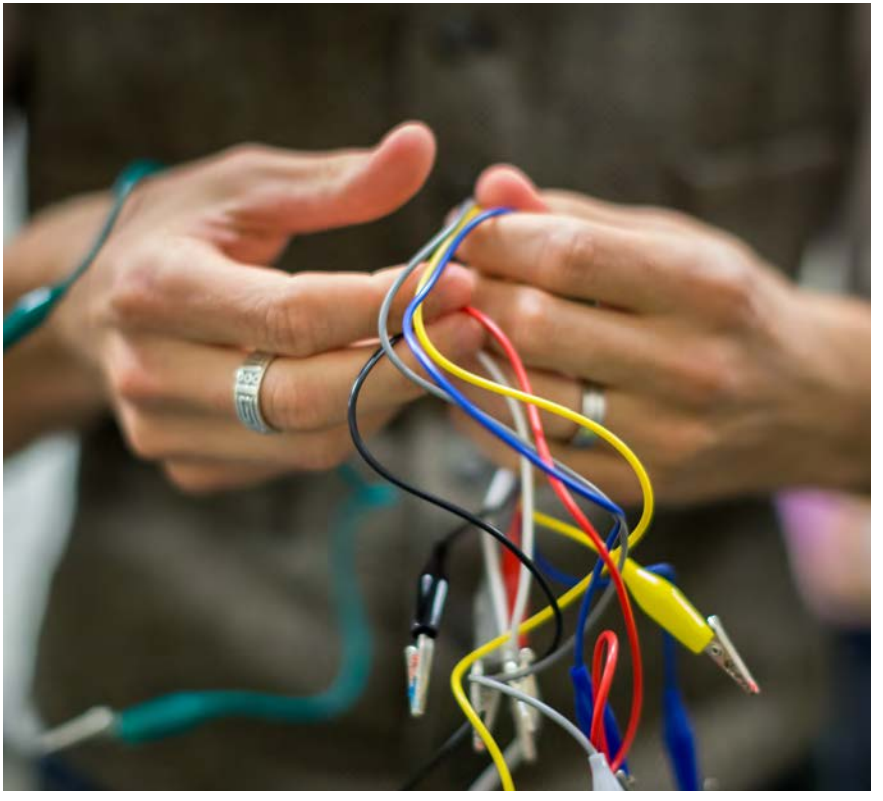
to ultimately select a Targeted Instructional Area. This leadership experience has expanded my role as an educator and taught me how to positively impact my students on a broader scale than just my day-to-day classroom practice.

The next phase of my educational practice involves both instrumental and missional goals. With regard to instrumental thinking, I plan to increase student motivation by adding gamification elements into my practice. To achieve these goals, I plan to use tools such as Camtasia studio to make video tutorials, my YouTube channel to share the videos with students, and Schoology course management software to create and manage my gamified courses. My missional goals include expanding my educational impact to include my current and future high school staff with instructional leadership efforts on issues around science curriculum, grading, and gamification efforts in the classroom. Ideally, I would love an opportunity to have a hybrid role of chemistry teacher and science coach at the high school level.

This I believe...

... the fulfillment of an education; is constantly improving your practice and expanding your impact to positively affect learning for all.

Kevin Cram



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Joanna Doyle

Joanna is passionate about helping students and teachers become technology creators, not just consumers. To this end, she is always on the lookout for new opportunities to play with technology and is learning alongside students in the makerspace she created at her school. Currently, she is geeking out on designing a K-8 Computer Science and STEM curriculum that individual students can customize based on their interests. She thrives on professional collaboration, so catch her presenting at a conference or get in touch with her through twitter: @joannafdoyle or the Google+ community: plus.google.com/+JoannaDoyle. She would love to hear your edtech ideas!

To achieve great things, two things are needed: a plan and not quite enough time - Leonard Bernstein.

Recommended Reading

Invent to Learn by *Sylvia Libow Martinez & Gary Stager.*

Invent to Learn is a must read for anyone interested in making, engineering, or STEM education. Sylvia Libow Martinez and Gary Stager provide a comprehensible historical background and theoretical framework that leaves the reader feeling confident that this approach is, in fact, in the best interest of our children. They also provide enough practical advice and resources to ensure that anyone can set up an engaging maker-centered learning environment.

The past, the present, the future

My goal as an educator is to bring hope to my students. I want every child to know that no matter how crazy their life seems, they have the ability to follow their passions. Teaching is about facilitation and mentorship. It is about opening doors to opportunities students never knew existed. It is about providing rich experiences and modeling the joy that can come from perseverance in the midst of risk-taking. It is about empowering kids to follow their curiosity where it leads -- to build a culture of Wonder.

Initially, when I joined the MSUrbanSTEM program and began to design my curriculum, I was thinking about what I was going to have kids do. My curricular theme was "Making and Unmaking." The students were going to be makers and tinkerers; making and unmaking things to understand how they worked.

As I continued to design the learning experiences in my classroom, my thinking started to shift. Making and unmaking came to mean iteration. I focused on helping students develop a design process, moving from my idea of reverse engineering to showing students how to improve their designs based on testing. While that was important, I soon realized that wasn't really the true meaning of my theme, either.

My students finally helped me to understand that my take-away from MSUrbanSTEM is not directly about the kids and what they do. It is about me and what I do. Even though I considered myself a good teacher before, through radically making and unmaking myself, I can become a GREAT teacher. My actions, attitude, and worldview are the biggest determiners of success in my classroom.

The kids already know how to learn. It isn't about changing them, it is about changing me. It is all about me. That selfish statement may be the most student-centered epiphany I have ever had.

This past year, I had the honor of interviewing Sylvia Libow Martinez, an advocate for making in the classroom. She shared a piece of advice that has stuck with me: practice the art of being unreasonable. She challenged me to dream big and stop compromising before I even ask for what our kids need.

Sylvia's call to "unreasonableness…from a place of righteous power and promoting student welfare" inspired me to reimagine what curriculum should look like. As a result, I am developing a student-centered K-8 STEM/Computer Science curriculum framework that allows students to piece together their own curriculum path based on their individual interests and talents. One component of the curriculum will give students the chance to write individual learning grants that are funded by their school. My goal is to publish the curriculum digitally under a creative commons license by September 2020.

This I believe...

... change is a leap, not a step.
... I will never be the limiting factor in my classroom.

Joanna F. Doyle

Kenneth B Freeman

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Kenneth Freeman is an educator with a Bachelor of Science degree in Electrical Engineering, as well as a Master of Education degree in Instructional Leadership. Throughout his career, he has operated under the belief that creating sustainable success is best achieved through setting goals, executing action plans, and swiftly correcting problems in order to remain on target. During his 15-year career in the Information Technology field at AT&T and Motorola, he utilized this approach to establish and maintain some of the most sophisticated technology environments within those companies. As a Middle School Math and Technology educator within the Chicago Public Schools (CPS) System, he's continued using a process-management approach toward building academic excellence among adolescents in predominantly low-income areas. He has also provided instructional leadership and change control management training to adults and teams throughout CPS.

There's an old Wayne Gretzky quote that I love. 'I skate to where the puck is going to be, not where it has been' - Steve Jobs.

Recommended Reading

Managing Transitions: Making the Most of Change by *William Bridges.*

Understanding the pressure, stresses, and human responses to situational change was a very critical component of my becoming a professional. Whether I was leading people in my first career as technology supervisor/director or leading groups of students in my current career, this book illuminated ideas surrounding comfort zone and change capacity of humans.

The past, the present, the future

Tempered Radicals like myself have faced struggles conforming with and rebelling against the status quo. I have particularly had difficulties with ambivalence, cooptation, and career burnout. After obtaining my engineering degree from UIC, being pretty much the only black student in the majority of my classes for 5 straight years, I had a strong desire to help insure that others like me had opportunities to pursue advanced technical degrees. I understood that this meant kids like me needed to be better prepared coming out of High School. After I began my career with Motorola, I convinced their Human Resources personnel to fund an after school College Prep outreach program that I spearheaded. Due to the pressures to work later hours, travel opportunities, and bonuses tied to performance, I ended up dropping the program after a couple of years. After 12 years of corporate advancement via making similar compromises in the changes I wanted to bring about vs. the material success I also sought, frustration and burnout set in.

Professionally as well as personally, the key drivers of any success that I've had begun with establishing clear and achievable goals – first. This has been followed by a deliberate set of actions, with milestones, that I have undertaken to help insure successful completion of these goals. Unless ones goals are frivolously defined, I don't agree with the notion that goals are to be changed based upon progress (or lack thereof) of the execution of ones plan to achieve them. Of all the activities that I've undertaken in the STEM-Wipro program since its inception, I hope it has been clear that my goals have been unwavering. Instead, what has changed based upon my experiences in this program is my approach, as well as various aspects of the implementation plans that I've pursued.

The overarching goal that I established for myself at the beginning of this program remains intact. This goal has been to use the knowledge and skills that I've obtained from this fellowship to "Foster Interest in STEM Educational Disciplines Within Young African Americans to Help Close the Gap in Workforce Diversity Among Blacks and Others Working in STEM Careers." One of the major changes in my approach toward achieving this goal has been to divide my efforts into short-term and long-term milestones. The major short-term milestone that I've focused on in this regard has been to expand the current grass-roots middle school STEM program at my school, Spencer Technology Academy, from Math-only to include Science and/or Computer Science at the beginning of the next school year. The long-term milestone that I will be working towards over the next three to five years will be to make a career transition from an elementary to a higher education Instructor position. In that role, my hope is to move beyond fostering STEM interest in minority students and instead focus on helping them to build their skills and expertise in Math and Technology in preparation for jobs in STEM career fields.

This I believe...

... creating sustainable success is best achieved through setting goals, executing detailed action plans, and swiftly implementing corrective actions when goal completion milestones are not being met.

Kenneth B. Freeman


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Chrissy Garcia

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Chrissy Garcia is a middle school English language arts teacher, former science teacher, at Orville T. Bright Elementary. She is committed to providing all students with a quality education through engaging student centered instructional activities, opportunities to create and collaborate with peers, and through an integrated curriculum. As a result of coursework from the MSU Urban STEM program, Chrissy plans to develop scientific literacy in her building through the analysis of local environmental issues, current events, and the implementation of a STEM infused literacy curriculum. Chrissy is a proud alumna of Chicago Public Schools, the University of Illinois Urbana-Champaign, and the Golden Apple Scholars Program.

Education is the most powerful weapon which you can use to change the world - Nelson Mandela

Recommended Reading

Science Matters: Achieving Scientific Literacy by *Robert Hazen & James Trefil.*

This book provides readers with a comprehensive overview of fundamental scientific concepts in efforts to promote scientific literacy, essential knowledge needed to understand public issues. The concept of science literacy aligns with the Common Core instructional shifts, which include regular practice with complex texts and academic language; reading, writing, and speaking grounded in evidence, and building knowledge through content- rich non-fiction.

The past, the present, the future

Creating and implementing my Dream IT project, analyzing environmental issues in the South Deering community, was a transformative teaching and learning experience for my students and me. Through a relevant curriculum, collaborative planning, and student driven instruction, students were able to critically examine how industrialization has affected the ecology of our community. Students identified their wonders, researched answers to their questions, actively sought out community experts to learn more about the issues, proposed project ideas, and publicly shared their learning with friends and family. When students asked a local activist to explain his rationale behind his argument against KCBX's extension proposal, I realized something awesome was happening. Students had the background knowledge to engage in a scientific argumentative conversation about real issues affecting their community. This experience has sparked me to redefine what a literacy classroom looks like, specifically integrating inquiry and STEM disciplines into my instruction.

Through the development of a STEM infused language arts curriculum, my goal is to develop scientific literacy to promote critical thinking, global citizenship, and allow students to transfer skills and strategies across content areas. This goal will be accomplished by using local, national, and global issues to develop a relevant and authentic curriculum. The Dream It curriculum will be enhanced and expanded over four quarters for the 8th grade curriculum. I will continue to build local partnerships with the Southeast Environmental Task Force and UIC professor Dr. Erdal. After five years in the classroom, I feel confident in my ability to explore other realms of education beyond the role of a classroom teacher. In the future, I hope to transition from a classroom teacher to a coach or curriculum writer in efforts to build STEM capacity in schools.

This I believe...

... students deserve opportunities to drive instruction.

... scientific literacy fosters student engagement and a deep understanding of local and global issues.

... activism can transform communities.

Christine Garcia

Tasha D. Henderson

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Tasha is a STEM (Science, Technology, Engineering, and Mathematics) Coordinator for Chicago Public Schools. Currently, she teaches grades K-4 Engineering and has been an educator for eleven years. Tasha is a lifelong learner. She has a deep passion for mathematics, science and technology. She is a Chicago native and enjoys the downtown scenery. Previously, Tasha served as a Senior Database Administrator for the Chicago Board of Trade. In her spare time, she enjoys the arts such as theater, dance, and music.

My future starts when I wake up every morning. Every day I find something creative to do with my life - Miles Davis

Recommended Reading

Rocking the Boat by *Debra E. Meyerson*

Rocking the Boat inspired me at various levels in STEM leadership. This book gives a fuel and focus to the responsibilities needed to explore areas in STEM leadership. It explains the complexities of leadership in any organizational setting. Being a tempered radical ignites a new meaning to be an agent of change. Tempered Radical is someone is can make simple and subtle positive changes from the inside out in any organizational structure.

The past, the present, the future

The teaching profession has always captured my attention starting back when I was an elementary student myself. I have always had a love for learning in any capacity. This love for learning has never stopped as I continued through high school, college, and the present. I equate education to a tiny mustard seed. It starts from a very small beginning, but can grow to a full size tree that provides for many others. The teaching profession opens the door to an entire world and provides just as a mustard seed, resources for millions. I am passionate about everyone receiving a good and solid education no matter whom they are and where they live. I have an obligation to use my gifts and talents in the field of education and I believe that children can enrich my life as well. There is no other way more rewarding than to give the gift of education to another individual. As an old proverb goes you can give a man a fish and he will eat for a day, but you can teach a man how to fish and he will eat for a lifetime.

I believe strong passionate leaders must have a missional thinking mindset because an effective leader should always look at their leadership skills as a service to help others. As an educator I see my leadership skills as a service to my students, their families and the community in which I work. I use my skills to help those who are in a need of service, whether that be educationally and/or even socially. Missional thinking supports my personal and professional beliefs in the system in which I work and serve my students and families.

In my DreamIT project, my students explored the world around us through an engineering lens. We looked at various items in our everyday life that had engineering embedded as it foundation. The guiding question for the Unit was "Engineering is all around us in our world. How can engineering be explored in everyday materials?" This question drove the teaching and learning for the unit as whole.

Children are born engineers! They are always fascinated with the world they are born into. To understand the world we live in, it is vital that we foster a foundation for engineering and technological literacy in people and especially our children. My goals for the project were to expose my students to the field of engineering; and to help them realize that nearly everything in the human world has been touched by enginering. I want them to understnad that profession of engineering is easily attainable through proper education and that engineers come from all races, ethnicities, and genders.

Content. The transformation I saw in my students' understanding was actually knowing what is engineering? My students learned engineering is not just a process but can be concrete items that are composed or decomposed. Communicating the designs and process to a boarder audience is a means to help others understand your ideas.

The concept that my students found challenging was envisioning themselves as future engineers based on the environment they live in on a daily bases. Some students may not know an engineer and even heard of what an engineer does for an occupation. The Engineering Design Process was explained as a process they may already do and take part in without even realizing it; such as fixing their bike or a flat tire on a bike; or making plans to fix it and testing it to see if it actually works! This will tie into failures and troubleshooting. Showing my students that failures do not always have to be tied to a negative platform, but are natural progression to product development. Technology is often used as a means of communication.

Pedagogy. The pedagogy practices that worked best for my content were:

Questioning instructional strategies at the core of the lessons, which cause students to think deeper about what they already know and what they would like to explore.

Guided Discovery allowing the students to manipulate the everyday items we use.

Exploratory instruction open learning environment in which the students was provided a rich, networked database of information, examples, demonstrations, and exercises from which the student selected whatever was appropriate to their current needs and mental models.

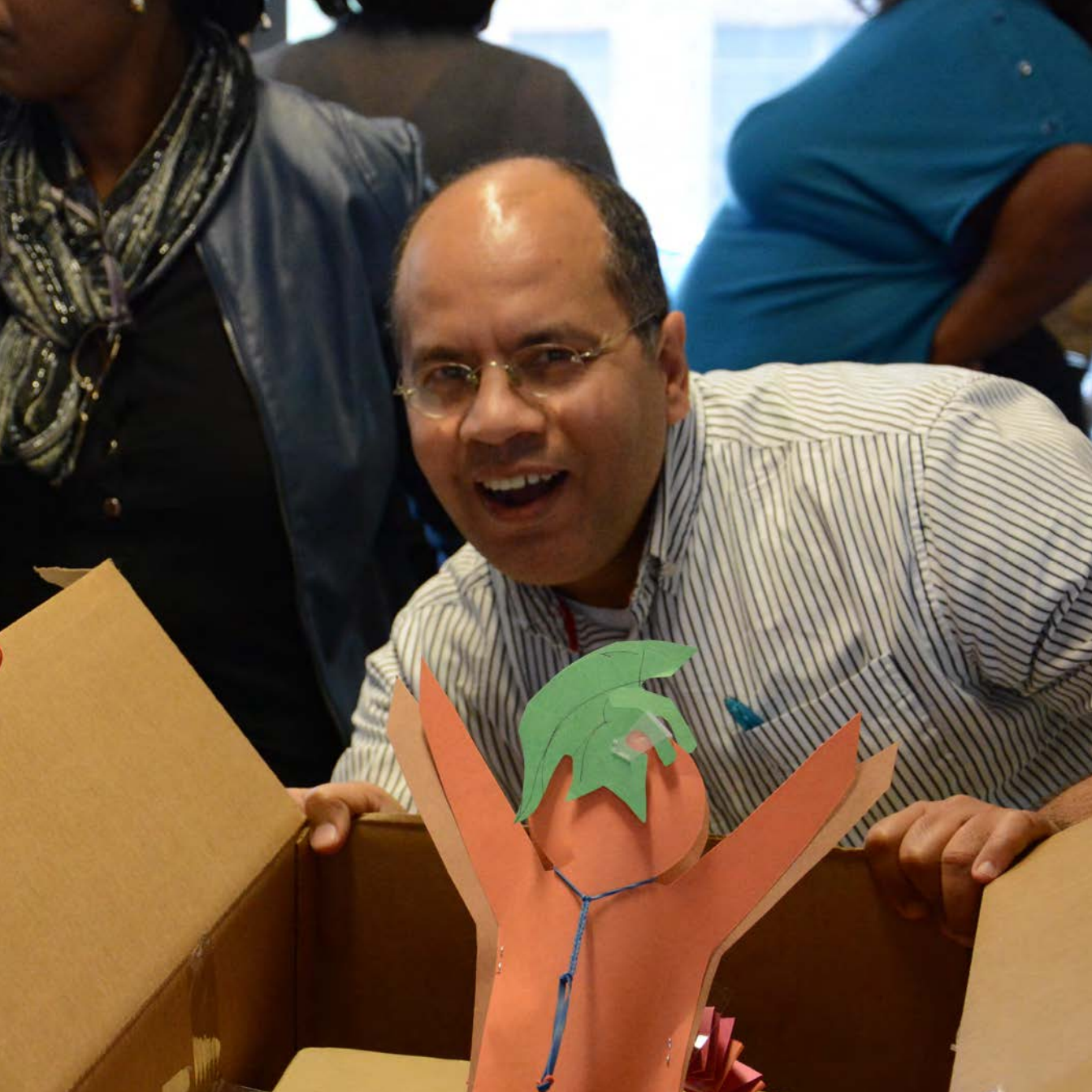
Technology. Technology integration was used throughout the unit using various activities. As a result of technology integration, my students became skilled in assembling and dissembling objects. They were able to design, construct, test and improve their own prototypes.

My long-term goals are to possibly start a STEM school or STEM Enrichment program that can support schools in any area. The lack of STEM programs for all students no matter where they live must to be addressed. I know if and when students are exposed at an early age to hands-on STEM focused programs, their interest in the field will increase tremendously. Hopefully, I plan to accomplish these goals within the next 5-10 years.

This I believe...

... I enjoy the everyday challenge of teaching my students new and interesting aspects of education. I also find it more fulfilling getting to know my students for who they are and what they can contribute to our society. I encourage each student to see their self-value and their strengths because everyone has a strength and contribution to make to the world around them!

TASHA HENDERSON



Ajay Kalra

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Ajay has been involved in the field of Math education continuously for 16 years as a Math Educator. He has been teaching/facilitating math courses ranging from pre-algebra level to advanced calculus level at High schools, community colleges, and universities. He has also had an opportunity to teach college algebra to US Marines stationed in the US embassy In New Delhi, India. Ajay earned his Master's degree in Mathematics from the University of Delhi. He did his math teaching certification program from National Louis University in Chicago and completed Master of Online Teaching (MOT) from University of Illinois (Urbana-Champaign). Ajay was one of the 37 teachers selected by Chicago Board of Education from all over the world under Global Educator Outreach (GEO) program. His experience has led him to a stronger understanding of all of the different learning styles and needs of students, and his job is "to help you identify and use your particular style in developing your math skills."

I cannot teach anybody anything; I can only make them think-Socrates.

Recommended Reading

How to Win Friends and Influence People by *Dale Carnegie*.

I found this book has very easy advice to avoid arguments as I believe nobody wins in an argument and people get stressed. Also, it's human nature to get defensive and react badly to criticism. This books provides lot of good advice how to make people listen to you and show interest in you. This book also stresses the importance of actively researching other people's interests, which helps to sway their thinking and win them in your favor, which is very important for educators.

The past, the present, the future

I have been teaching and facilitating math courses ranging from Pre-Algebra to Advanced calculus for last 20 years. In last 20 years, I have learned many different effective instructional strategies and methods to enhance learning process. Last year was particularly very important for me as MSU-WIPRO Urban STEM program helped me and provided different ways of incorporating STEM (Science, Technology, Engineering, and Math) in my lesson and unit plans, and also showed how different educational technologies (like Blended space, Learn Zillion, Better Lesson, etc.) can be used in classrooms to make learning of concepts interactive and interesting.

I believe MSU-WIPRO Urban STEM program helped me to improve and develop new leadership qualities. This program encouraged me to take leadership roles in my school and reflect on them. Due to this program, I was motivated and encouraged to embark on the DreamIT project and run focus groups in my school, both with students and teachers, which helped to enhance my leadership qualities.

I have set up many goals for myself. It is my responsibility to be ready and prepare for challenges after rollout of common core standards, and changes in benchmark, summative assessments. I have already started designing and creating plans, activities, questioning/ discussion techniques, tasks (with rubrics), incorporating appropriate educational technologies to enhance my instruction methods, and share with my colleagues. I have already started to organize math department teachers to take collective actions and rise up to challenges of changes in standards, assessments and evaluation process of both teachers and students.

This I believe...

... we are lifelong learners and a teacher has to appeal to different learning styles, to offer a variety of instructional experiences, and needs to keep an open mind to new teaching techniques to give every student the opportunity to participate fully and actively in the learning process.

Ajay Kalra

Beverly Keane

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Beverly Keane is an elementary science lab and an upper grade health teacher at Mark Sheridan Math and Science Academy. She has been in the field of education for over twenty years, holds licenses in elementary education, and has an administrative teaching license. She enjoys learning and hopes to inspire her students to engage in and enjoy learning too. In her current teaching position at Mark Sheridan Academy, she has the privilege to work with students from kindergarten to grade eight. She considers herself very fortunate to share her love of science with these students. Students will often tell her: "I love science!" And she enjoys the surprised and happy look on their faces when she responds enthusiastically: "Me too!"

The mind is not a vessel to be filled, but a fire to be kindled - Plutarch.

Recommended Reading

The Martian by *Andy Weir.*

This fictional account of a mission to Mars is jam packed with accurate, high level science yet is completely relatable. The detailed descriptions of the problem solving processes utilized by main character, Astronaut Mark Watney make this book a truly enjoyable page turner. This work is important as it exemplifies that science is an engaging process for all not a dry topic for a limited few.

The past, the present, the future

I am a teacher today because of the outstanding educators I encountered as a student. I was privileged to have many caring and exemplary teachers who ignited my desire for knowledge and inspired me to become a life-long learner. Teaching is full of challenges too numerous to describe here. Fortunately for me, my teachers modeled a respect for learning coupled with a calm reserve, flexibility, and flawless manners. Whenever I encounter challenges, I draw on these memories as resources and they have helped me face whatever the school day brings. My hope is that I, like my teachers, can inspire my students to engage in and enjoy learning.

As an MSUrbanSTEM fellow, I have been revitalized as an educator. My skill set has been expanded and refreshed. Through this program, I have gained technology skills and pedagogical strategies that have rejuvenated my approach for addressing content and reaching students. My students and I have delighted in this year of inquiry and discovery. Through the use of Skype, my students have had the opportunity to discuss chemistry with the author of a chemistry book they read. This discussion with Author Larry Gonick resulted in my lessons being featured on the American Association of Chemistry Teachers web page this past March. I also started an after school engineering club and recruited two engineering students from the Illinois Institute of Technology to join our club. These engineering majors and our students truly enjoyed utilizing the various technology tools and strategies I acquired through MSU to address various engineering topics.

As I go forth with my newly gained skills and refreshed approach to education, my goal is to share what I have learned with others. My missional goal is to model being a life-long learner for my students and for my colleagues. I will search out worthwhile, engaging, and

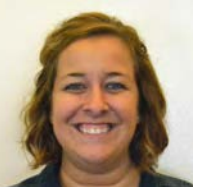
challenging activities to reach all of my students. I will do my very best to ignite a passion for STEM in students and kindle their joy of learning. To do this, I will improve my leadership skills so that I can influence other teachers by my actions. I will share what I have learned through the program and the resources I have collected over the years with my colleagues.

This I believe...

... students learn through experience and when teachers craft meaningful, engaging, and active lessons, we evidence to students that we value them and their learning experience. Teachers inspire students by modeling respect for all and reverence for learning.

Beverly Keane


#MSU



Ashley Keine

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@KeineKash

Ashley is a second grade teacher working in Chicago Public Schools. She has been teaching second grade for five years on the south side of Chicago in the Hyde Park neighborhood. She is also the technology coordinator and works on the Instructional Leadership Team for her school. Ashley graduated from Michigan State University in 2009 and is currently working on completing her Masters in Educational Technology through Michigan State by the end of Summer 2015.

Ashley has a great passion for education and helping children reach that "ah-ha" moment. She want my students to have a rich, truly integrated, learning experience where meaningful connections are made and curiosity is ignited. She wants her students to be able to answer the question, "Why do I need to know this?" by genuine application to their daily lives. She is looking forward to continuing to bring innovative teaching and learning to her classroom from all that she has learned this year in the MSU-WIPRO STEM fellowship cohort.

Each one, teach one - Nelson Mandela

Recommended Reading

Big Questions from Little People: And Simple Answers from Great Minds by *Gemma Elwin Harris*.

During this year, I came across a great resource for my students and myself. Big Questions from Little People, is a collection of questions about daily phenomena from students and simplistic answers from the experts themselves. When speaking to Ms. Elwin Harris I learned two important lessons. First, one should never stop questioning and learning. And second, the world we live in is our greatest classroom.

The past, the present, the future

I graduated from Michigan State's Elementary Education undergraduate program in 2009. I spent the summer after graduation teaching in South Africa through MSU's pre-internship study abroad program. With my internship already lined up in Chicago for the following semester, I spent the summer abroad learning a new culture, helping where it was most needed in the most impoverished communities, and understanding and appreciating how fortunate our schools are in the United States. The experience in South Africa was life changing and has been crucial in shaping me into the educator and person I am today.

After returning to the States, I started within Chicago Public Schools with a hugely ambitious heart to affect change and grow myself as an educator. Six years later, I still find myself in the school I completed my internship with. It has become my home within Chicago. Along with my colleagues and wonderful leadership, we have been making great strides to continue the growth for our students, our school, and our community. I believe that every child is worth great value to our society and that we should teach the whole child, both socially and academically. As I continue through my career, I strive to be a better person than I was yesterday and learn from every blessing that is given to me. This thrilling year was jam-packed with endless growth and opportunities. From being a part of an inspiring cohort of educators, to implementing new and exciting strategies within my classroom, this year has been nothing short of amazing. I appreciate the support I received from my fellow colleagues within the fellowship.

We grew into a group of educators with a common goal; to explore, create and share. My teaching will forever be changed by this program. The transformations I have seen within myself and my students have been significant. Inquiry through technology is not just a rare

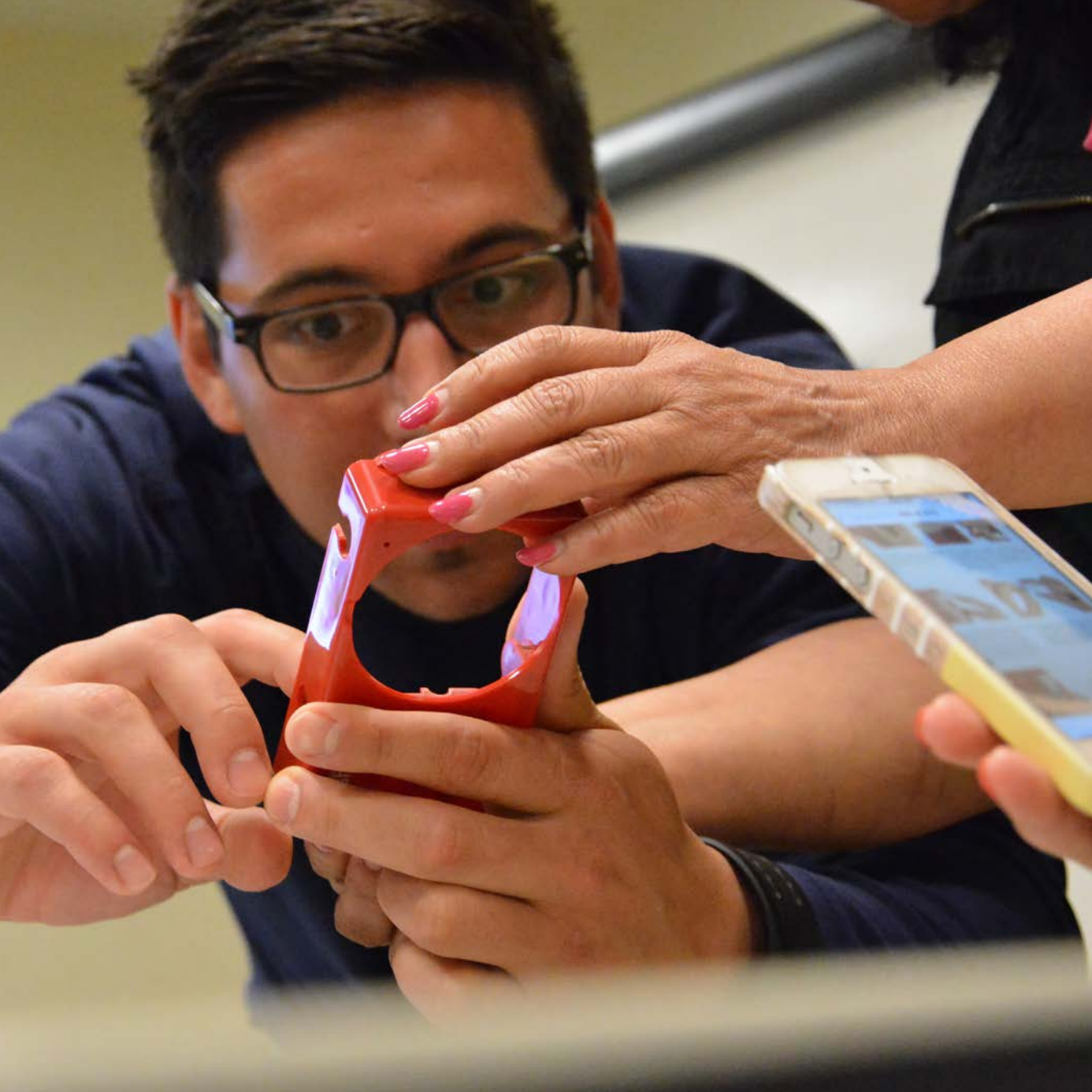
occurrence in my classroom anymore; it is what drives the teaching and learning for my second graders. The MSUrbanSTEM Fellowship has given me the confidence to explore new avenues of instruction and allow my students to feel comfortable with that exploration. Through these developments, we have created a classroom where my small yet mighty second graders are exploring new ways of learning, creating remarkable showcases of understanding, and sharing their work with such pride. This end result for my students and me is invaluable and I am forever grateful for this opportunity.

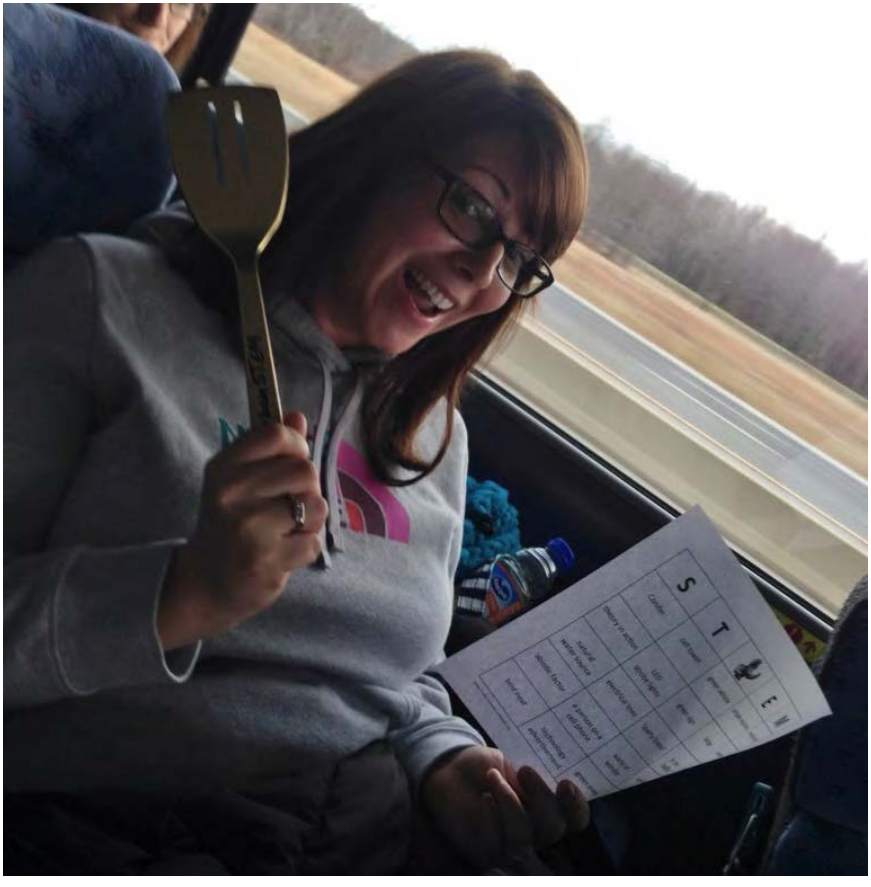
This fellowship has given me the confidence to know that with any new and great initiative, there needs to be a level or patience, persistence and passion and I look forward to continuing to implement them with my classroom. Yet, it doesn't stop at my classroom door. I have instilled curiosity within other educators in my building to follow me on this journey of STEM development. As I grow into an educator who is committed to exploration, I look forward to becoming a leader and a catalyst for change within my school, my district and my profession. I understand that is a bold statement, however that is exactly what this fellowship has done for me. I feel well equipped to pursue opportunities that will ultimately change the way teaching and learning happens within a classroom.

This I believe...

... this has been a year of growth around exploring new strategies for teaching and learning, creating authentic, meaningful work, and sharing the excitement and advantages to STEM learning.

Ashley Keine

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Dinner in Antibes
LED spotlights
Natural water heaters
Wooden barrel
Wind-to-heat
Solar light
Solar heat
A wooden plate and plates
Solar/wind/gas refrigerator
Wind-to-water
Wind-to-electricity

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@mrskeiner #keinermath

Adrienne Marie Keiner

Adrienne is a current Chicago Public Schools teacher at Peirce International Baccalaureate Elementary School, where she has been teaching 6th grade mathematics for the past 3 years. Before she moved to 6th grade, she taught 8th grade math and science for 7 years and 4th and 5th grade science and reading for 1 year. Adrienne did not plan on becoming a teacher; she actually didn't know what she wanted to do with herself, until 2001. After the tragedy of 9/11, Adrienne knew she had to be a force for change. How do you get people to change? You teach them! Apparently, she was born to teach, because she loves her job. She can't imagine doing anything else in the world. Adrienne completed her undergraduate degree at Loyola University and Masters in Leadership from Concordia University. She also has endorsements in Science and Mathematics from University of Chicago. She considers herself a learner forever.

"Education is the most powerful weapon we can use to change the world - Nelson Mandela

Recommended Reading

Do the Math: Secrets, Lies, and Algebra by *Wendy Lichtman.*

The book, Secrets, Lies, and Algebra, is for those who hate math and love reading, and for those that hate reading and love math. It covers all middle schoolers. Students who struggled with reading and students who excel in reading will both enjoy this novel, because it hits home on every level. It has plenty of middle school drama while teaching reading, language arts, and math skills. Plus, the author loves to speak with classrooms and will Skype anytime you're available. Students loved meeting the author and asking her questions about her writing. I highly recommend this novel.

The past, the present, the future

I was your average "bad" kid. I loved school because that's where my friends were, but I hated school because they made me work and think. How dare they? I played, I talked, I couldn't stop moving. Nowadays teachers probably would've medicated me and labeled me ADD or ADHD. But in the 1980's they didn't know what to do with me. "She's a puzzle," my teachers and doctors said. One day I would score ridiculously high on a test and the next week horribly low on the same exact test. Thankfully my mother wouldn't give up and fought for an individual tutor that stayed with me through high school. If I had not gotten such fantastic help I would not be where I am today. I believe the teacher I am today is a direct result of the struggles I had with my own learning in grade school and high school.

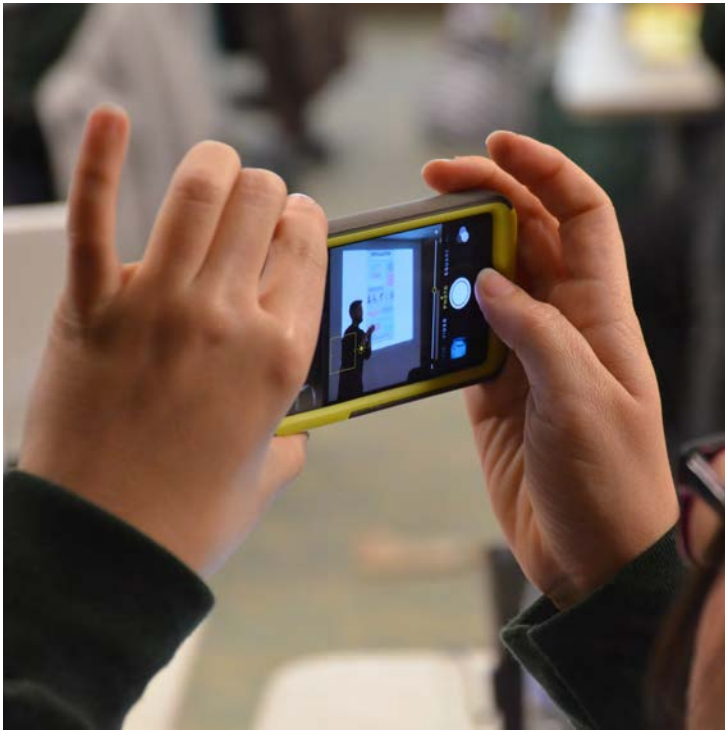
There are so many educational options for teachers these days, professional developments, masters programs, and a multitude of endorsement programs that make many promises to further one's teaching practices and career. I have been a part of such programs and I was bored through every single one. When I made the decision to apply for the MSU-WIPRO fellowship my expectations were extremely high. The program sounded almost too good to be true, it was everything I wanted to bring into my classroom and more. After the two week "quick-fire" indoctrination I was hooked. Everything I was taught during the year within this fellowship I use daily. I am shocked at how much I use them personally and professionally. My students were enthralled with every lesson, activity, and project. I, of course, took on way too much but learned to filter for the needs of my current students. Every year I improve and modify my lessons and units of study. While I did this, I looked at them through a different lens, a STEM lens. I would never have had such a great year without going through such an interesting, challenging, and fulfilling program.

My mission for this upcoming school year will encompass students using technology daily, either in school or out, to communicate mathematical thinking and understanding across multiple subject areas. Such daily technologies include but will not be limited to: student Weebly accounts, Google, Twitter, Prezi, Blendspace, Piktochart, stop motion video creation, meme generation, hand held flip cameras, Chromebooks, and tablets. To differentiate learning, while all students are using said technology to express thinking, the content or objective may differ according to individual students. Weekly updates to students' websites, using taught or provided technologies, will show levels of mathematical thinking. Students will be using at least two stated technologies in the first two to four weeks of school while learning the safety and security procedures of using technology professionally vs. personally. After the initial technology lessons are established new programs and uses will be added to monthly units. By the fourth quarter students should be communicating through their choice of technology mediums.

This I believe...

... I believe the teacher I am today is a direct result of the struggles I had with my own learning in grade school and high school. Today, I am forever a learner. When I think I know everything, I will probably retire.

Adrienne Reiner



Jen Lewin

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Jen Lewin is a middle school science teacher at John C. Coonley Elementary. She teaches 6th-8th grade science which spans earth/space science, life science, and physical science. As a former research scientist, she has a passion for the pursuit of knowledge. Starting her second career in museum science, she worked at the Peggy Notebaert Nature Museum as an educator in teacher programs, student programs, and outreach education. She then transitioned into the Chicago Public Schools as a science coach working with K-8 students. After transitioning into the classroom she started refining her skills and working on best practices that can only come working one-on-one with students. She believes that learning through experience is best practice not only for students, but for educators too. Jen has a Bachelor of Science in Biology from Loyola University Chicago and a Masters of Education from DePaul University.

> Look deep into nature, and then you will understand everything better - Albert Einstein.

Recommended Reading

The Devil's Teeth by *Susan Casey*

Imagine yourself seeing Jaws for the first time. Growing up with summers in Florida, I developed a deep respect for our Earth's oceans. I had a different take on Jaws in that I sided with the cartilaginous fish. This creature that has biology so deeply rooted in the history of the Earth was mistaken for a human hunting machine. I was too practical of a child to enjoy the Hollywood factor of Steven Spielberg's masterpiece. I wanted justice for the shark. I wanted

people to know they were misrepresented. In The Devil's Teeth, Susan Casey follows a research team studying white sharks near the Farallon Islands. She witnesses their behavior and lives amongst the harsh conditions of the area. She gains a humble perspective experiencing the dedication of the field researchers for the majestic fish with biology deeply rooted in time.

The past, the present, the future

When I worked in research, it was something I had dreamed about since I was little. My dream was always to work in field research, but my first job was lab research and I was excited nonetheless. I had a very dreamy vision of what the job would be like, but over time I started to see some of the common problems you see in research. Funding was running out, the department was dominated by men (only one female researcher in the group), and I was working in a basement office with no windows. I enjoyed the job, but quickly realized that the career I had always dreamed of didn't fit with other dreams I had. I decided to pursue a degree in education with the goal of teaching science. I could still research. I could stay current on scientific advancements. I could have windows.

This past year has showed me that even though I have a strong interest in technology, I am not as versed in educational technology as I thought I was. It was very exciting to see that I did not have as much knowledge as I thought I did. I was learning new techniques that were not only fun for me in planning instruction, but were engaging in the classroom. The students soak up whatever you can share with them and to watch them embrace the technology and make it their own was exciting! As the program comes to a close, I realize I don't want this to stop here. I want to stay current with

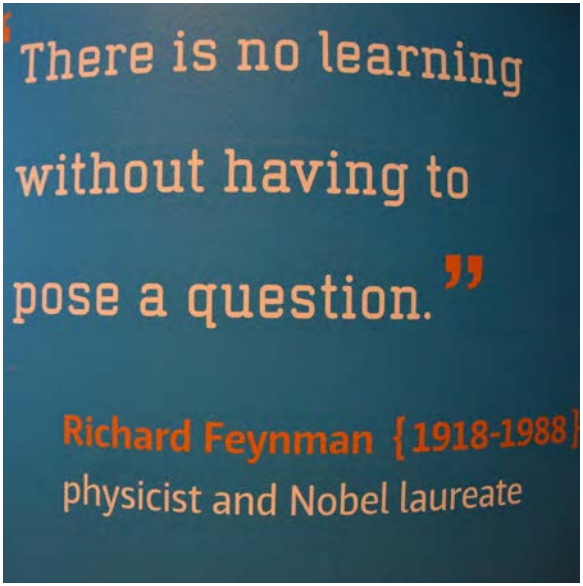
technology and incorporate it even more into my instruction. As a STEM educator, I can recognize areas in my pedagogy that still need professional development. It fulfills the need I have to constantly learn and adapt to new science and technology. Unlike other professional development, Michigan State has given us the tools to continue the learning in a new way.

One of my main goals is to work on streamlining the accepted science scope and sequence for the Chicago Public Schools. I want to create a solid STEM program K-8 in our school. If we provide the tools that teachers need to teach, then I know they will implement an effective program. We have identified a lack of supplemental resources and a lack of quality professional development. I see this as an investment to our school and I know it will increase student capacity over time. Connected to this is my desire to step out of science more and pursue professional development in technology, engineering, and mathematics. In order for me to see the bigger picture, I need to understand the needs of STEM while maintaining a thorough understanding of each discipline.

This I believe...

... I try not to regret the past. If I have not learned from my previous experiences, then I am missing part of the bigger picture from which I am only a small piece.

Jennifer Lewin


"There is no learning
without having to
pose a question."
Richard Feynman {1918-1988}
physicist and Nobel laureate

Roberto Lituma

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Roberto was born in the mountains of Gualaceo, Ecuador, and graduated from the Salesian's high school of Cuenca. He worked as a teacher at a technical school as well as in the field of industrial mechanics. He came to the United States in 1982. In 1992, he moved to Silicon Valley, California, to work as an Electronic Testing Engineer. In 1993, he came to Chicago, and has been working as an elementary school teacher since then, because ultimately his passion is teaching mathematics. Through teaching, he has also found a way to continue his other passion, which is coaching soccer.

Roberto received his Bachelors of Electronic Engineering from DeVry University, and two Master's degrees from Chicago State University in Bilingual Education and Mathematics. He also holds a range of certifications and endorsements to teach math, ESL, and Computer Seience and Spanish at various levels. He is a STEM teacher. He is married and has five children.

> Education is not preparation for life, education is life itself - John Dewey

Recommended Reading

Rethinking Mathematics by *Dr. Gutstein & Bob Peterson*

Rethinking Mathematics contains an assortment of ideas which connects mathematics with many social issues. I am certain it will empower students with the appropriate tools and will give them inspiration to explore the field of mathematics. I have been personally inspired by this book.

The past, the present, the future

My journey in teaching began with the desire to have a better life and an opportunity to become educated. I began to walk the road of an educator through the industrial implementation taken place at that time in the country where I lived. As a child, I walked for an hour down the mountains to go to school every day, until I began going to a prestigious Salesian's high school. I treasured every moment of my education because I was the only child in my family to be able to go to school. When I began teaching, I was inspired to share the beauty of knowledge to all my high school students and at the Ecuadorian National Institute (SECAP). Welding, Miller and Lathe machines, along with technical design and blue-prints were my favorite subjects.

At that point in my life, I felt the necessity of including more modern methods and expand my knowledge towards the field of computers. After a few attempts, I came to the United States which I called my new home. I had the curiosity of connecting the mechanical skills with electronics, and in 1992 I became an electronic engineer. After a short time in the field, I decided to go back to school to update my teaching credentials which certified me to teach kindergarten to high school in mathematics.

While working at an elementary school, I received an invitation from Michigan State University in conjunction with WIPRO and CPS. In the classroom I have witnessed the challenges that the students were having, such as the lack of basic mathematical concepts from year to year, and with that, I had the desire to continue to encourage all my students to visualize mathematics unlike any other subject that is mandated to study, I looked at the DreamIT project as a symbol of my proposal. My goal was to ratify the concepts that they have learned in the classroom by means of activities that happen in real life and nature. These activities would help students develop

and expand concepts, investigation, and prepare them for the next level. I am including current events and presenting to my students mathematical concepts with examples of daily life with images, short videos, I-images, differentiated instructions, performance, and ongoing assessments. I also use games and exercises to increase interest of math in young students.

My plan in the following years is to continue teaching at the elementary level because a child's foundation in math leads to preparation for their future in this mathematical world. I will use the activities learned during these STEM classes, social media, and TPACK practices promoted from our professor Dr. Punya, Mishra. The STEM curriculum and the practices implemented during this year with MSURBANSTEM professors have helped to keep present goals in place.

The MSURBANSTEM project was an oasis in a stormy time of my teaching career; I regained confidence, equipped myself with more tools, and also helped revive my teaching philosophies and rejuvenated my compromise of staying on the path of education. I am grateful to all the institutions and to our leaders from Michigan State University who guided and supported me this past year. I am given special thanks and adding to my golden list the names of 24 smart, happy and awesome colleagues that were part of the FIRST URBANSTEM LEADERSHIP program.

This I believe...

... it is my belief that now is the time to bring the big idea and have the goals in the horizon to anchor the principles that will direct the path in this journey. My idea is to emphasize understanding and how to transfer math topics to real life situations and natural world scenarios, which will encourage stude nts to discuss by asking questions, and doing activities which will help to find solutions, and retain concepts much longer as well to activate their thinking process to make correct decisions and apply them to other subjects.

Roberto Litumo


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Anna Puleo McGowan

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(Sauganash STEM Lab)

@sauganashteach

Teaching was not Anna's first career exploration but it is now her true passion. Anna began her career as a healthcare marketing executive, working for hospitals, managing care organizations and advertising agencies. She chose to switch careers after she realized that she wanted to give back to the public educational system, which had been formative in her life. To that end, Anna received her M.A.T. from Dominican University and has been teaching in the Chicago Public Schools for the last six years. Prior to this year, she taught middle grades science at schools in the South Side and North Side. Currently, Anna holds an exciting new position as the K-8 STEM teacher at Sauganash Elementary School. Here, she teaches students the fundamentals of scientific exploration in the younger grades, incorporating the STEM disciplines and use the Engineering Design Process to "Make Science Visible" to students in the upper grades.

> There is no substitute for hard work - Thomas Edison

Recommended Reading

Good Will Hunting and Dead Poet's Society.

I could cite many useful and educational books I have read over the years on my journey to becoming a better teacher. However, when I need course-correction and a dose of inspiration, I watch a Robin Williams' double feature of Good Will Hunting and Dead Poet's Society. These movies explore the diverse paths students and teachers take in their quest for knowledge.

The past, the present, the future

Education is my lifeblood. It is what connected me to a strange culture as a child of immigrant Italian parents. I vividly remember going to Kindergarten and not knowing what anyone was talking about. It's like the feeling to being underwater; you hear muffled voices and see shadows but comprehend nothing. Had it not been for my wonderful teachers and parents, I would have been lost in a maze of words. As a result, I can now empathize with my students who are struggling in class; whether it be with learning disabilities or dual language challenges. These experiences also stirred a fire of determination within me. I tell students about my background and academic struggles to illustrate that anyone, including a child of immigrant parents, can receive a full scholarship to Harvard College. I fundamentally believe that students from ANY socioeconomic or ethnic background should have access to high quality education, and they can achieve whatever goals they set for themselves using grit and perseverance.

As an MSUrbanSTEM fellow, I now believe that students are the architects of their own learning, and that teachers and parents are instrumental in providing the blueprints, tools, and raw materials for them to acquire knowledge. Teachers must be the facilitators of knowledge, and students must process that knowledge using a variety of instructional modalities. The MSU instructors modeled this facilitative approach and allowed the fellows to construct their own knowledge. I have since tried to model this approach in my own STEM Lab, and it was certainly a struggle to operationalize for all grade levels. However, one of my greatest achievements as a teacher was watching students struggle, persevere, and find joy in achievement during my STEM classes. At the end of the year, I see students who are confident, resilient, and more determined to succeed amidst their "epic fails."

In reflecting on the past year, I am very proud of having built an elementary school STEM program from scratch using limited resources. I successfully executed my DreamIT vision of "Making Science Visible Through Engineering." I was able to create the beginnings of a Makerspace environment for my students. In Year 2 of the Sauganash STEM Lab, I intend to incorporate more math and technology components into my instruction. In addition to the robotics unit, I will also be rolling out a Biotech unit for students in grades 6-8. I am also planning to incorporate iPad learning centers with my K-2 students so they can use the technology to further construct meaning and demonstrate their thinking. Another goal I have is to enhance the Makerspace environment in my classroom and continually create dynamic and engaging learning opportunities for my students. Through this environment, I want to spark interest in the STEM professions and demystify them for students who feel they are not "good" in a particular subject. In essence, I want students to love learning about STEM.

This I believe...

... the past year as an MSUrban STEM fellow was one of the most rewarding and invigorating educational experiences of my life. It has renewed my love of teaching and provided me with tangible and intangible skills to utilize in my new position. I am excited for the future of this program, and I can't wait to have more colleagues in this amazing professional network.

Ana McGowan

- Understanding
- Teaching that sticks (SUCCESS)
- Amnesia, fantasia, inertia, nostalgia
- Disciplinary Thinking
  (purposes, Knowledge, Methods, form
- Preconceived notions
- conceptual misunderstandings
- vernacular misconceptions
- factual misconceptions
- aesthetic understanding
- Differentiation
- Performance Assessments (Assessing U
- Conceptual Chang
- Big ideas
- Wonder
- Inquiry
- Creativity
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- TPACK
- public & communal learni
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Steven Mijajlovic

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@smijaj

Steven spent first three years teaching mathematics at Kenwood Academy. He is currently starting his third year at Disney II Magnet High School teaching Algebra I. He has taught a range of mathematics classes from seventh grade mathematics up through Honors Pre-Calculus. He earned a Bachelor of Arts in Accounting and Finance from Augustana College (Rock Island, IL). After his undergraduate degree, Steven went through an alternative teacher certification program partnered between Northwestern's NU-Teach and the Chicago Teaching Fellows. Through this program, he obtained his teaching certification at Northwestern University. Steven also earned his Master of Science in Education with a focus in Secondary Mathematics Education at Northwestern University. His research project focused on mental math and pushing student thinking.

> Practice does not make perfect. Only perfect practice makes perfect - Vince Lombardi

Recommended Reading

Quiet: The Power of Introverts in a World That Can't Stop Talking by *Susan Cain*

In Susan Cain's Quiet, she digs deep to help the reader understand the positive differences between an introvert and an extrovert. The author focuses on the positive of both personality types with a focus on developing a deeper understanding for an introvert's thinking process and cycle of social interaction. "Our schools should teach

children the skills to work with others – cooperative learning can be effective when practiced well and in moderation – but also the time and training they need to deliberately practice on their own." One of the most notable issues the author discusses in the book is about the subtle leadership skills of introverts – introverted leaders focus on building the institutions they run, not their own ego and thus produce better outcomes than their extroverted counterparts.

The past, the present, the future

I have been a classroom mathematics teacher at all levels for the past five years. No matter how hard the work can be, the satisfaction one can receive from positively impacting the lives of students in need cannot be put into words. The students in our city deserve the opportunity to be in classrooms with other students and educators who uphold the highest standards and expect an unmatched effort one-hundred percent of the time.

Our focus at Disney II Magnet is integration and helping students understand the world around them, all the while pushing students to become lifelong learners. If I can help students make those meaningful connections with the world around them and understand mathematics at the same time, I firmly believe that connection to be a great success. Having an integrated project for each unit or related units is a goal of mine – through my experiences working with urban students over the last five years, I have realized the importance and impact of project based learning.

Over the course of this school year, my main focus started with integrating my Algebra I class with our Physics first course. As my process of creating and developing integrated assignments and projects for my Algebra I class, I started to develop an interest in

problem based learning. Which essentially brought me to my current state of mind and areas of interest, trying to implement problem based curricula and incorporating real world phenomena or problems to introduce math concepts.

I would like to start thinking about leveraging my STEM learning & leadership and performance analysis expertise to transition into a role as an educational advisor, assessment creator, or curriculum developer.

This transition would allow for a new challenge with an opportunity for personal growth and development. As much as starting a new endeavor such as this excites me, I must continue to focus on being successful in the classroom and continuing to develop myself as an educator and educational leader within my current school and district.

This I believe...

... real learning occurs through the experimentation and failures which are not often enough acknowledged and appreciated. The struggle to wrap one's ideas around the problem and potential solutions is where the authentic learning takes place.

Steven Mijajlovic


World of Wonder
re more life forms living on your skin than t
by
adrienne keiner


#1for20
EDUCATION

Sussan Oladipo

Sussan Oladipo is an Assistant Principal with Chicago Public Schools with 15 years of service with CPS and 10 years of service with overseas in two African countries. As a teacher she taught chemistry and freshman math as well as environmental and Earth space science.

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He who learns the most leads the most - Anonymous

Recommended Reading

Leverage Leadership by *Bambrick Santoyo*.

I value this book because it provides a guide to effective school leadership. It spells out some details of what the day-to-day structure and system of a school should look like. It has been very helpful for me as an administrator.

The past, the present, the future

My high school principal and teachers have been my strongest inspirations. They cared tremendously about us and our education, and showed us the best way to get along with others. I grew and developed from their nurture and teaching/principles. Even back then I thought that teaching must be one of the most important professions there are. Since I have always been a shy and quiet person, when I decided that I will be a teacher, I had to face my worst nightmare of public speaking. I worried how to navigate the challenges in overcoming the fear of public speaking. However, at the same time, I knew that I was meant to serve in urban education so had to find ways to overcome my challenges.

I value self-discipline, integrity, respect and hard work. I believe in being kind to others including one's "enemies". I see all people as one and believe all people can dwell together. With reference to schools, I believe that diversity is extremely important in schools and that schools should not have to be segregated.

This past year as an MSUrbanSTEM fellow and as an educator brought new experiences to me. I came into it with the idea of diving deeper into the content areas of the STEM. I have learned much more than I thought.

Although I do not have students that I teach, my experience through the STEM program has had effect in my role as an administrator. My technology usage has improved quite a bit. I have used various technology applications including Google-Drive applications in my work. Videotaping and photos have new meaning for me in terms of work. Also in terms of ability to lead, when the principal I worked with transitioned to another position, I developed the boldness to lead. Amidst the challenges that I faced, I persevered to mobilize

others to accomplish the task before us. When an administrator in charge was brought in after one month, I built up the partnership that helped us work together till the end of the school year. My ability to unify people and work with others was very evident.

This program has given me a me a new way of thinking and seeing the world. My mindset, which has been that of a growth mentality, has developed to one that thinks inclusively. By this I mean that STEM may not just be limited to science, technology, engineering and mathematics, but also include the humanities, aesthetics, and others. I aspire to be more independent, to lead an independent cause for unheard urban students, for unheard minorities like myself. I will write, I will put experiences out there to enlighten, to motivate, to guide. I bring a broad varieties of experiences that need to benefit a wider diverse audience.

This I believe...

... that everyone matters; all people are one; that urban schools are meant to be very diverse in population, inclusive and integra ted in content areas; and that leaders should bridge the gap between the different constituents that make up school.

Susan Oladipo


Nikon

Zarina A Qadir

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Zarina is a teacher at Joyce Kilmer Elementary School, Chicago, Illinois. She has been in the teaching profession for the last 21 years. She was one of the recipient from Kilmer School selected to be a part of the NASA Science Cohort Program from Loyola University. The program was sponsored by Boeing. Through this program, she was invited to attend a one week retreat integrating Math, Science, and technology training from NASA at the Huntsville Alabama facility. The one week training was related to learning about Space science. She has also been a part of CPS Consulting Teachers Program mentoring and coaching teachers. Zarina was also selected by Project Exploration to learn about archeological science and visited Montana to dig Dinosaurs. She believes that every child is a unique individual, who needs a secure, caring, and stimulating atmosphere in which the child could become mature academically, socially, emotionally, and intellectually. She firmly believes that teachers should have high expectations from their students and motivate them to become life-long learners.

If you have knowledge, let others light their candles with it - Margaret Fuller

Recommended Reading

The Planets by *Dave Sobel*.

This is an eye-opening book for everyone to read and understand about the space. Her writing style is very unique that enlivens reader's curiosity. Dave Sobel has incorporated mythology, folklore, history, astronomy, story-telling, culture, and poetry in her chapters. The chapters are managed beautifully and are very engaging, bringing

the heavenly bodies close to one's own backyard. The chapters are organized by planets, and they include discussions on history, mythology, geology, and the scientific community that has discovered and explored the planets and their neighboring objects. Her prose is lyrical and her passion for science and space is very apparent from her book. The book is written in view to the non-science major and she managed it very well. I strongly recommend reading this book.

The past, the present, the future

I was inspired to become a teacher when I was asked, by one of my Math teachers, to coach a number of students in math and prepare them for a state test. I worked very hard with these students for a month, with phenomenal results. This inspired me to become a teacher. There have been many struggles along the way but nothing can stop you if you have the passion to teach and the courage to face the challenges. It is very rewarding when I meet my former students who have successful careers.

Being a recipient of the MSU Wipro Fellowship was a very exciting experience. It has been a rewarding year of learning by integrating STEM into the curriculum. It was challenging and fun not only for me, but for my students. My students are thrilled of getting involved into various science projects. Most of my students were not exposed to such hands-on projects and experiments. It was so easy to apply the knowledge I gained during the year into my classroom.

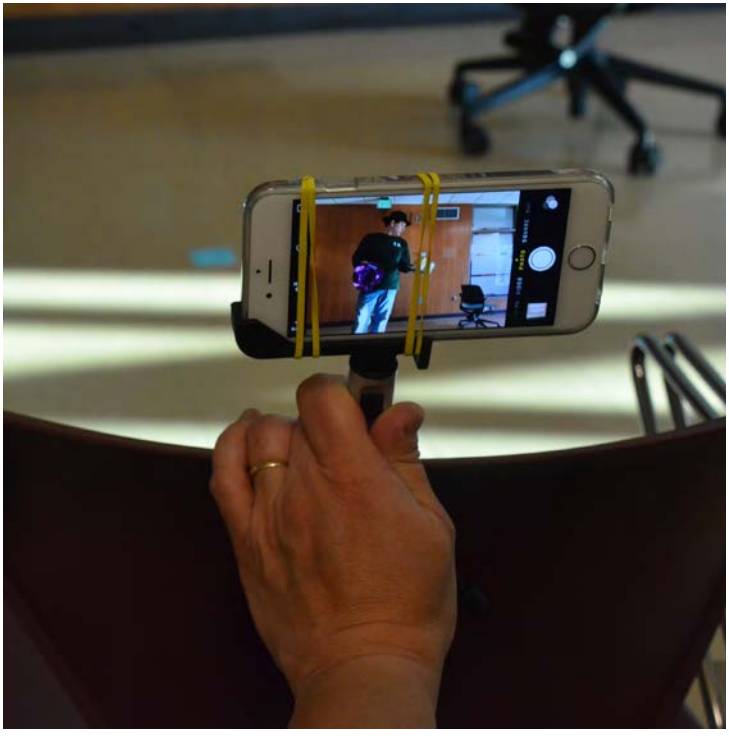
My plan is to continue focusing on implementing and integrating math, science, and technology in my future lesson units. I wrote a few grants to purchase Kindle and Nook books for my students. I have planned to present these ideas to the school administration to have the eBooks and laptops for all students. I do share my missional thinking with my colleagues and the school administration. I have

assumed the leadership role in working with my colleagues in order to implement various STEM Projects school-wide to enhance our students' learning. I have planned to involve three or four teachers of my school and facilitate them to integrate STEM activities in my school during the forthcoming school year. I am planning to keep networking with the STEM team and facilitators to keep abreast of new ideas, activities, and programs, especially related to math, science, and technology.

This I believe...

... that teaching is a dynamic process of ongoing learning, embarrassing new ideas, and incorporating them into our curriculum if we want to keep the learning candle lit for our students.

ZARINA - A. QADIR



Alicia Song

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Alicia came to the United States 35 years ago, shortly after which she began her career in teaching. Her first job consisted of tutoring mathematics to 4th grade students, when she was only fifteen years old; an experience she has never forgotten. That feeling of teaching is still very much alive in her 35 years later. In her professional career of 20 years, nothing feels more exciting to her than seeing her students reach understandings and wonder about new knowledge. Alicia has a bachelor's degree from University of Illinois at Chicago and a Master's Degree in School Leadership from Concordia University. Currently, she is a bilingual teacher in Chicago Public schools and teaches science with STEM (Science, Technology, Engineering and Math) integration in the Life Science curriculum, where she also oversees the school garden as an extension of her classroom.

> Live as if you were to die tomorrow. Learn as if you were to live forever - Mahatma Gandhi.

Recommended Reading

A Planet of the Viruses by *Carl Zimmer*.

Just this year, I recommended this book to a fellow science teacher after reading it and placed it in his hands. A couple of days later, I wondered what he thought about it. His reply was surprising yet expected: "I did not sleep last night I just couldn't put it down." Thinking back to my own experience, I also was not able to stop reading it after the first chapter. I recall writing an e-mail to the author Carl Zimmer as soon as I finish reading it. This later led to an interview experience that I will never forget. A Planet of the Viruses is truly a captivating way for educators and students to gain an understanding of the fascinating world of viruses. In short essays, Zimmer paints vivid pictures of the unknown. This is a powerful book that

can influence learning in students for years to come. Carl Zimmer also implants the idea that viruses are not just everywhere but that humans and viruses have commonalities as far back as when life began. Viruses are not only the invaders and threat to our existence, but also a part of us.

The past, the present, the future

I never back out of a challenge. This program was one of the best professional experiences I have ever had. I see this experience as a beginning that will define the next half of my career. I feel blessed that I was able to join a group of wonderful mentors and educators that have challenged me in every way possible. I was terrified of technology before this program, today I say, "Bring any challenge, I don't fear it. I will embrace it." The knowledge that I have gained completes me as a teacher professional, and as a leader. The most satisfying aspect of it would be to share it with other teachers.

Some of the most important experiences this year were the challenges that I encountered throughout this program, which shaped me as a leader. I believe now that these challenges – that often seem like obstacles – are only ways in which you can grow as an individual. They are necessary to create change and growth. Especially the QuickFires; they were very challenging for me (Thanks Candace for your creativity). Most importantly, a leader needs to be defined by values that are at the core of the teaching profession. One of our reading selection, Rocking the Boat book, taught me how to identify ways in which I can lead my life to make positive change. Looking back to this experience, I cannot understand how I stand here. The important thing for me is that I have learned to stand against all adversity. I need to remind myself that I have come a long way, and that is really what matters.

I hope to be a more relaxed and creative teacher, especially with technology. To do so, it is important to learn from the best and that's what I have experienced in this program. In the next five years, I see myself working as an assistant principal in a school where I can motivate others by sharing what I have learned, especially to reassure others that they can change and improve, while integrating STEM in teaching. The resources that I have gathered from colleagues and my own are providing me with tools that will facilitate this vision: the goal that I have set to integrate STEM in the Life Science curriculum and school gardens.

This I believe...

... building capacity in teaching in this time and age can no longer be done in isolation. It requires that you surround yourself and connect with a network of experts that are driven, creative, and knowledgeable in the field. It also requires that you have courage to try something new and embrace challenges.

Alicia Song

IN BROKEN IMAGES

He is quick, thinking in clear images;
I am slow, thinking in broken images.
He becomes dull, trusting to his clear images;
I become sharp, mistrusting my broken images,

Trusting his images, he assumes their relevance;
Mistrusting my images, I question their relevance.

Assuming their relevance, he assumes the fact,
Questioning their relevance, I question the fact.

When the fact fails him, he questions his senses;
When the fact fails me, I approve my senses.

He continues quick and dull in his clear images;
I continue slow and sharp in my broken images.

He in a new confusion of his understanding;
I in a new understanding of my confusion.

Robert Graves


WIPRO
LEADERSHIP

Angelica Tobias

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Angelica considers herself a lifelong learner who just happens to be an educator. She has been an educator for five years in the Chicago Public Schools. She is currently the Instructional Science and Engineering Coach for Marvin Camras Children's Engineering school and is excited to support their amazing and hard-working teachers. Angelica's passion is STEM education, specifically in engineering since in her "previous career life" she was an electrical engineer. She literally sees engineering everywhere. She even collects plastic bottles, toilet paper tubes, broken electronics, and anything recyclable for future engineering projects. Her goal is for teachers to learn how to incorporate STEM literacy in their classrooms and for all students (especially urban underserved and underrepresented students) to have access to quality STEM education programs.

Education is not the learning of facts, but the training of the mind to think - Albert Einstein

Recommended Reading

You Can If You Think You Can by *Dr. Norman Vincent Peale*.

This book was inspirational to me when I was at UIC working towards my electrical engineering degree. Anyone who has studied engineering knows how difficult it is. It was especially hard for me since I was lacking in my background skills (science and math). I was especially lacking in confidence as I was one of only a handful of Hispanic women in my engineering classes. I must have read this book over 20 times until it became a part of me.

The past, the present, the future

I was an electrical engineer before I became a teacher. I absolutely loved engineering! However, after my fourth child was born, I decided to stay at home to raise my children. I stayed home for 9 years and then looked into going back into engineering. While working as a stay-at-home mom, I had been volunteering at my children's school and as a Sunday school teacher, where I found I really loved teaching children. I decided to follow my passion and applied for the Bilingual Transition to Teaching program to become a bilingual teacher at a high needs district. Teaching has been harder than engineering – it is an underappreciated profession and I am constantly going to classes to be a better teacher. However, teachers know that it's all about the kids. That's why we teach. That's our passion.

Being a part of the MSUrbanSTEM fellowship has been a great experience. It has been tough juggling my duties as teacher, an MSU student, and my personal life as a mother and wife. However, I am so glad to have experienced this fellowship. This fellowship has helped me tremendously with my professional growth as a STEM educator. I had the content knowledge in science, technology, engineering and math, but what this fellowship taught me was how to take the content and make it accessible to students, and to get them excited about learning. I have learned how to incorporate technology in a meaningful way in my teaching, especially social media. I have seen my growth as a STEM leader blossom. I no longer just see the present, but see how I can influence STEM education, and be a STEM leader by working towards incremental change.

What has changed for me being an MSUrbanSTEM fellow are my goals. Earlier, I had more short term goals. I am now thinking and planning for long term visions and goals. I can now see myself as a change agent for my school, CPS, and beyond, as I work to help teachers integrate STEM literacy in classrooms. The other goal is to have all students (especially underrepresented students) have access to quality STEM education programs.

This I believe...

... that to FAIL
is just one's first
attempt in learning
and that's OK. I
believe that We Can
if We Think We Can.

Angelica Tobias


SCIENCE

Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning - Winston Churchill

This I Believe

The Struggles, Joys & Motivations of 25 STEM Educators

In this book, 25 STEM educators in Chicago Public Schools reflect on a year-long experience with the MSU-Wipro STEM & Leadership Fellowship program. As they look back at their year of transition, they share the experiences that led them to become educators; their present struggles, joys, and motivations; and the journeys that lie ahead. This book is a collection of what they deeply, truly believe, and as such can serve as a resource as well as a source of inspiration to other educators.

STEM & LEADERSHIP
TEACHING FELLOWSHIP PROGRAM