

A person wearing a white lab coat, safety goggles, and a face mask with a colorful geometric pattern. They are giving a thumbs up gesture with both hands. The background is a textured surface with a green-to-purple gradient.

ANNUAL REPORT 2021

acera
The Massachusetts School of
Science, Creativity and Leadership



Acera is, without any doubt, the best school our kids have been in. This is not just a function of the individual teachers, but also the whole – the totality of experience – that you have architected for the children. It is a remarkable achievement."

— Anthony, Acera parent

LETTER FROM DIRECTOR & FOUNDER COURTNEY DICKINSON

Dear Community,

Times of crisis test us. Leading a school through this pandemic, a recession, and eruption of racial injustice re-awakening nationwide have all required intense focus and commitment.

In challenging times, it might be tempting to lean on regulations and policies to define solutions. I believe that it is most important, though, to situate oneself back into a space of innovation and humanity. When in doubt, seek to understand. When a challenge erupts, think creatively to pivot into a new opportunity. Galvanize the team to remember our mission and make decisions true to our purpose and philosophy.

What do we see that shows our responsiveness and strength? We adapted rapidly in March 2020, pivoting to all-remote overnight. That spring, we shared free all-remote learning resources with public educators, and we launched a Pop Up school. Through the summer, we dramatically adapted our summer program to all virtual learning experiences – often with hands-on kits – rather than merely canceling things wholesale, which would have been far simpler. And we worked meticulously to redesign our entire core school program for the 2020-21 Covid school year.

We gave all families and all staff choices about their school experience – whether they felt a need to be all-remote or preferred to be at school. We consulted experts to make thoughtful decisions to reduce density, establishing cohort class groups, improving filtration, and creating norms around distancing, masks, Covid testing and more. Through all this, we also stayed true to our mission of giving students choices and keeping learning built around high interest, project-based, hands-on, relevant learning.

We trusted our teachers to invent and adapt in ways that truly fit the needs of their students, and once again they proved to be tireless heroes, inventing, adapting and responding. They invented methods to make Zoom discussions and remote curricula engaging. They embraced the safety and opportunity of the

outdoors, redefining learning experiences which kept alive students' curiosity and offered opportunities for all-remote students to join hybrid students in person outdoors, during electives and creativity stations, and on hikes. I am profoundly grateful for their dedication, innovation, and creativity in shepherding their students through these unprecedented times.

We responded to the call for action around equity and racism by engaging in a year-long diversity, equity, and inclusion (DEI) professional development priority, leveraging external facilitators and experts. Thanks to a generous anonymous Acera family, we have launched a diversity scholarship fund to include more Black students at Acera. We have expanded elective and curricula offerings that focus on equity and justice topics, and supported student initiative to take action in these areas. While this work is never done, we reinfused intention and focus in this key area.

And now? Enrollment and new applications are up. In June of 2021, we celebrated our largest graduating class in Acera history, and in September we will welcome the school's largest student body to date. Our program offers more support than ever for our students, with expanded counseling and literacy/writing teams.

Using our mission and core values as guideposts, we weathered this storm, and all signposts indicate that we are emerging out on other side of this intense time a stronger organization than ever!

All the best,



A handwritten signature in black ink that reads "Courtney Dickinson".

Courtney Dickinson, Founder and Director

CURIOSITY & INNOVATION

Discover, innovate & learn with a voracious mind. Maintain a sense of wonder in our world. Enable freedom and joy in learning, with choices, control & sense of purpose in learning. Encourage others to think, engage, and come up with their own ideas. See challenges as opportunities. Uncover possibilities and pilot new approaches with courage. Encourage risk taking. See struggle and failure as part of learning. Iterate.

BEFORE**COVID**

This land is your land; this land is my land: Acera's youngest students build collaborative communities.

How do you make clothing without machines? Do you use a fishing rod or a fishing spear? What games do you play? What do you use for transportation and how do you build it?

Students of Ms. Jen's lower elementary class asked Native Americans these and other questions during a field trip to Plimoth Plantation in the fall of 2019. The trip – which tied to the year's schoolwide theme of Human Needs – was the launch of a thematic study unit on collaborative communities. In addition to the trip to Plymouth, Ms. Jen integrated books like Elizabeth George Speare's *The Sign of the Beaver*, a visit from Wampanoag tribe member and storyteller Annawon Weedon, and even the lyrics to Arlo Guthrie's "This Land is Your Land" to deepen the kids' understanding.

They viewed a time-lapse film about North America revealing all the civilizations that have existed over time, as well as how boundaries were drawn from 600 AD to the present day. With the concept of shared land now emerging, the students took on the challenge of creating collaborative communities of their own.

Beginning by designing and making individual structures out of classroom materials – and creating their own stories about them – the students then engaged in groups of two or three to bring their structures together in harmony on the “shared land” of a large piece of paper. The practice connected kids back to the experience of the Indigenous Peoples of North America during colonization, and forward to the activity of creating a giant wooden map for their classroom, on which they labeled the names of the states and found homes for their structures.

Along the way, friendships and relationships developed in this young classroom. As they settled into classroom norms, the kids learned from experience that making is easy, but re-sorting and re-organizing materials can be hard. Building is fun, but taking turns with ideas and collaborating is challenging. These are lessons that are really important for life!



Acera has allowed me to grow in ways I never thought possible. It's given me the ability to explore my passions, to innovate, and to see creativity as a doorway and not a distraction.

— Kira, graduating Acera student



Our Climate, Our Future

Room 2 is synonymous with Acera students on the brink of high school. As this group is thinking deeply about the work that ties to their classroom theme, they are also keenly aware of their future. So it's not surprising that – when presented with the theme of Human Needs in the 2019-2020 school year – they took the concept a step further by delving into potential responses to these needs in a unit on Climate Change.

They began with an overview of the scientific evidence on the causes and effects of climate change, the details of the Paris agreement, and the rate of compliance among the 32 countries with the highest levels of greenhouse gas emissions. The students then focused on what people at all levels of society – countries, corporations, cities, and individuals – can do.

Following the interests of the students themselves, core classroom teachers Bob Defandorf and Ruma Dutta facilitated their investigations into governmental and corporate responses to climate change, reduction and

adaptation strategies, renewable energy sources, and climate change denial. Using the En-ROADS climate simulator to analyze what effects could be created by policy changes, they worked in groups to create presentations on the climate action plans of numerous cities of varying sizes in the United States, and wrote individual research papers on topics like afforestation, electric cars, and hydrokinetic energy.

The unit tapped students' critical thinking and problem solving skills, tasking them with finding place-based solutions to a global issue, and motivating them to weigh the benefits and drawbacks of a particular strategy not just as they relate to climate change but also to other environmental and social concerns, allowing them to make a reasoned argument on its effectiveness. This, in turn, cultivates them as leaders and thinkers with the tools and skills needed to help shape the climate of their future.



For my project, I am exploring a potential solution to climate change. I'm researching releasing sulfuric acid into the atmosphere to create sulfate aerosols by combining with the water vapor in the sky. This would stop the greenhouse effect. I've read scientific papers on the matter, and plan to start writing a research paper of my own."

— Lillian, graduating Acera student



Interest Driven Learning and Intrinsic Motivation

A hallmark of Acera's middle school program, Passion Projects are critical drivers of intrinsic motivation. Students can propose any project they are passionate about, researching and writing a literature review, building a computer, organizing a service project, conducting a lab experiment, developing a video game or app, or creating a piece of electronic art. Every week, middle school students have blocks of time to design, create, problem solve, and iterate on a project of their choosing, while concurrently learning project management skills.

In December of 2019, more than 60 Acera students showcased their Inquiry, Maker and Passion Projects at the school's bi-annual IMPposium. There were maker projects with a community element, such as a student-made bike rack for schoolwide use. There were science based cooking experiments in homemade cheeses and yogurt. Students created apps to assist in meal planning and grocery shopping, programmed games in virtual reality, and wrote original fiction.

Passion projects are a way for kids to get excited about something, work with a mentor who can help them learn in an area they choose, and create something that makes them feel proud. This fosters a sense of purpose that motivates them to want to improve in areas of weakness, because they are bringing alive something that's important to them.



I wanted to do my Thor's Hammer project because I'm really interested in making magical objects from movies real."

— Lachlan, Acera High School student



Science, Perspective, and the Study of Why

Why are adults so irrational?

The arguably loaded question was posed to Lab Sciences Specialist Michael Hirsch in the midst of anti-mask protests in the early months of Covid 19. Rather than dismiss the question, Hirsch went to great lengths to help students answer it, creating a new elective called “The Study of Why.”

The unit focused on questions like: how does an external stimulus elicit a response? What does it mean to regulate an action? If something changes, is there a decision to change course? If so, when does one become aware of that impulse to change? Over the course of the elective, the students studied a broad variety of behaviors – in insects, plants, animals, and humans – to learn about the intricate series of steps that lead a living organism from stimulus all the way up to its consequence in ecosystems. In doing so, they learned not only some of the reasons why organisms behave the way they do, but also what signals those behaviors on a genetic level. They danced like spiders, moved like

plants, played like cats, turned on and off genes, and uncovered the unwritten rules that guide the many decisions and regulations of living organisms.

“Ultimately, when we circle back to the original question on why humans behave irrationally, what we found is that it all comes down to how humans process information differently,” said Hirsch. “I look at that class as an example of teaching something that I want students to then take out into the world. Because what it really was was a huge exercise in perspective taking, and science does have a place in this. You can use knowledge of science and how humanity operates and fits into the larger scale of nature to understand the role of self and how you fit into a community or ecosystem or the world as a whole.”

For Acera students, it was also a lesson on asking questions and following their curiosity. When we show students that their voices matter, we give them a powerful motivation to have agency in their education and their future.

Heroes, Villains, and the Roman Empire

Kids need a safe context to discuss ideas around governance, power, hierarchy, conquest and colonialism, culture, and identity – themes that regularly surface in novel ways in modern social and political discourse, but have always been central to the shaping of human society. In Ms. Vered's class, students used role play to simulate events of 44 BC in Rome.

In keeping with the class theme of Heroes and Villains, students asked questions like: is Julius Caesar a hero or villain? Who saw him as a hero and why? Why was he viewed as a villain to others? Why did his assassination mark the end of Rome as a republic?

Students are discovering the answers to these questions through perspective taking and role playing. After being randomly assigned roles – such as senator, soldier, plebeian, or patrician – students then created their own individual history and motivation. For example, one student invented the persona of a blacksmith who is trying to sustain her business and pass it on to her children. With this perspective in mind, the student became aware that war would be good for her business, while changes to the status quo would not be.

As their respective characters, students met in groups – which were specific to their roles and structured as the Roman republic was initially structured – to vote on certain actions, like proposing and enacting laws. The simulation has engaged kids in a political process which, while not identical to our own, is similar in many ways. And they have managed to, on their own, make a lot of the same policies and military tactical decisions that Rome made over a span of 500 years.

Ms. Vered's class went on to read Shakespeare's Julius Caesar. From their experiences in the simulation, as well as in their guided research into other aspects of ancient Roman society and history, students will be able to more deeply engage with the play and better understand the motivations of its characters. This inquiry-driven and student-led unit is building core capacities, empowering students to take on a challenging piece of literature, and providing opportunities for students to explore the universality of some human experiences and the importance of culture and context for many others.



From the Mystic to Michigan: Acera students explore scientific and societal impacts on water

The students cheerfully donned chest waders and stepped into the Aberjona River where it flows through Davidson Park. In pairs or groups of three, they measured temperature, clarity, salinity, pH, phosphates, and nitrates. At the same time, they experienced the water; feeling the strength of the current, the changes in depth, and the varying texture under their feet.

"It's really fun! You feel the water crushing you, but it's also really fun!"

The Watershed Investigations elective began with the pedagogy of place, collecting data on the river just steps from Acera. "At first, the kids got into their waders and took data over multiple weeks and then came back together to really analyze that data and talk about what it tells us about the river," said

Environmental Science and Ecology Specialist Kelly Wilson. "Now, we have adapted it to include more systems thinking elements."

The broader scope includes technical and visual activities like mapping the Mystic River Watershed, as well as delving into national and global issues around water that encourage students to think about ways in which water is an environmental justice issue as well as a scientific one.

"We're looking at case studies in Flint, Michigan and the Gulf of Mexico as ways of tying together our understanding of water on a granular, more scientific level with the larger systemic issues of access to water that are more social issues than technical issues," said Engineering and Maker Space Specialist Tim Bilodeau, who co-taught the elective alongside Wilson. "Then we combine our scientific understanding with social advocacy and activism as two complementary tools to solve large issues."

It's an evolution that gives equal weight to both the scientific aspect of water quality and human relationships to water, which in environmental studies, is exactly how it should be.



Thank you from the bottom of our hearts for creating a one of a kind school. At Acera, children get to fall in love with learning and find a community of unique thinkers."

— Acera Parent



A photograph of four students in a forest, all wearing face masks. One student is standing on the left with arms crossed, another is leaning over a rock in the center, a third is standing on the right, and a fourth is sitting on a large rock in the background. The image has a green tint.

OPENNESS

Have a humble heart and an open mind. Communicate with truth and compassion. Accept yourself and others. Communicate to share information, not just on a need to know basis. Have awareness about and tolerance of different styles.

The Science of Me: Metacognition & Mindfulness

How can we empower students to understand their own personal learning profiles, celebrate their uniqueness, and recognize, tolerate, and respect differences in themselves and others?

For the past three years, Ms. Anastasia's classroom has been exploring the intersection of neurobiology and identity using Mass General Hospital's ASPIRE "Science of Me" curriculum. Students learn the anatomy and physiology (A&P) of the nervous system and delve into specific topics such as attention, memory, and emotions. As they begin to understand the brain science behind these topics, they gain the problem solving skills necessary to improve and regulate them.

As the students build metacognitive skills in these "Brain Study" lessons, they also use what they're learning to practice mindfulness. For example, students learn the neuroscience behind which neurochemicals are released when we smile and how this can "trick" our brains into feeling happier. Then, if they catch themselves in a negative thought pattern, they have the tools to turn it around. They also learn that the brain's white matter can grow, especially

when we push through a difficult task. This, in turn, supports the concept of growth mindset.

These neurobiology lessons are also leveraged when students work on mindful breathing. Students learn that when we are worried, our frontal lobe – which plays a big role in executive functioning – isn't very effective, and our amygdala takes over. By taking deliberate, calming breaths, we can send a message of safety and calm to the brain. This helps us both feel better and think more effectively!

To complement this learning, students made individualized calming jars filled with glittering liquid; they practiced flipping the jars over and simply "being" while they watched the glitter fall. These jars then became part of students' personal toolkit for self-regulation. This tactile experience, they learn, helps them to grow connections in their brain, build more positive thinking, and practice strategies for self-awareness and self regulation skills, grounded in a scientific context.



Acera has been so open and such an accepting community; it has allowed me to be who I want to be and grow as a person."

— Leo, graduating Acera student



AFTER

COVID

Parent Community Meetings address uncertainty, questions and hopes

With unclear guidance, muddled data sets, and extreme anxiety wrought by the pandemic, transparent communication was paramount in summer 2020. At Acera, our doors are always open for questions, feedback, requests and ideas... but this was a whole new realm.

Early on, we decided that we would offer families and staff a choice about whether to be in person or fully remote. We also intended to – through ingenuity and copious outdoors learning where transmission risk was low – to stay true to our pedagogical philosophies about giving students choices, engaging them in the whole school community (not ‘just’ their core classroom group pod), and offering ability-based math classes.

In June, we conducted in-depth parent and staff surveys, gaining insight on their desire for in-person, hybrid, or fully remote schooling, as well as the reasons behind their preferences, such as an at-risk family member.



After taking direction from our MD/PhD consult team (Rich Colvin and Dave Grayzel), we enacted a plan that leveraged all the advised precautions for in-person schooling, including cohorting for indoors instruction, reducing building density of people by half, utilizing upgraded filtration and copious open doors and windows (even through the winter), and of course masks, distancing, increased cleaning protocols, hands-sanitizing and washing stations, and dramatically reduced use of shared supplies and group projects that require sustained interactions of a closer distance than six feet.

Via all-community Zoom sessions held in June, July, and August, we shared the basic outline of a hybrid in person model, with the intent that careful plans for re-opening would enable us to stay open all winter, even with

expected increased case levels. We outlined Covid protection strategies, and took questions in real time, and had one-on-one follow up meetings after each session. Concurrently, we had an all volunteer staff group meeting weekly to think about what was doable for adapting our program with all these new constraints, and three all-staff check ins during the summer months.

Engaging in often-conflicting opinions and needs – after operating in a state of emergency all spring – was, in a real sense, a continuation of operating in a state of emergency all summer. However, addressing fears and feedback head-on enabled us to keep adapting our plans to truly integrate and offer all-remote students robust inclusion in all-outdoors cross-cohort electives and creativity stations and recess.



COMMUNITY

Respect others. Support others to become the best version of themselves. Use talents to make a positive difference. See and leverage strength in diverse skills and varied ways of seeing the world. Understand where others are coming from and respect alternative points of view.

BEFORE

COVID

Acera students participate in day of community service

Throughout the 2019-2020 school year, students considered questions like “what are human needs?” and “why do they matter?” Having learned about Maslow’s Hierarchy of Needs, the kids took action to address some needs within local communities. On December 5, 2019, rather than a traditional field trip, students engaged in a day of community service.

In the morning, kids made scarves to donate to a charity, organized hundreds of personal care bags for a homeless shelter, created greeting cards to give to kids undergoing treatment at Boston Children’s Hospital, and made lasagnas to serve at a local women’s shelter.

In the afternoon, the students divided into groups to offer hands-on services to area nonprofits, giving them valuable insight into mission-driven organizations, including the En Ka Society, Aberjona Nursing Center, Food Link, Cambridge Women’s Center, and Bread of Life. They were able to engage with leaders and volunteers at these local organizations, learn more about their mission and the real world issues they address, and tackle some of the day-to-day tasks that help the communities they serve.

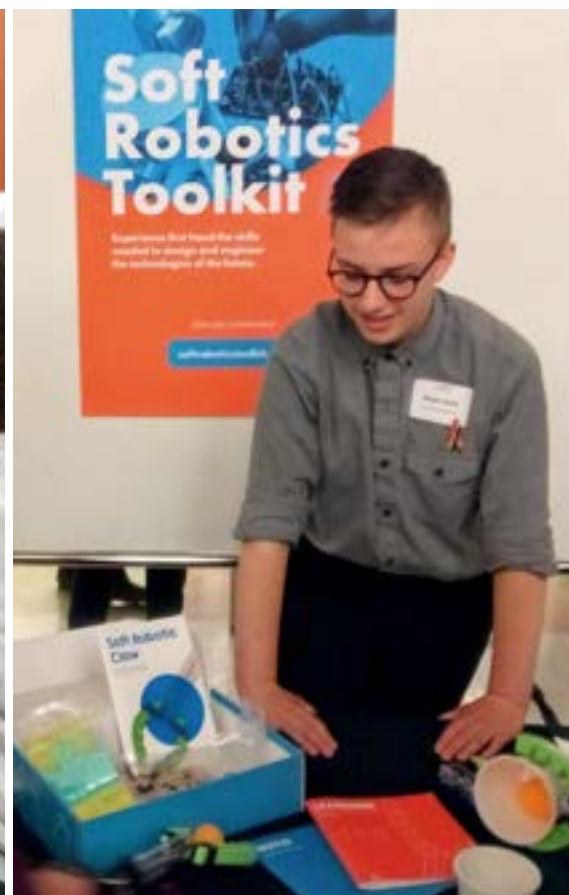


I’m making these hand warmers out of lavender for people in nursing homes. It’s pretty fun, and I feel really good about helping people. I’ve been doing it the whole day; making scarves, making cards, making backpacks for homeless people. It really feels good.”

— Josie, Acera student

Acera's Innovator Symposium

On October 24, 2019 Acera School buzzed with activity. In the Commons, parents and kids interacted with computers, explored soft robotics, and watched self-driving cars in action. In the Innovation Hub, they dissected flowers, took on design challenges, and made lamps inspired by nature. And in classrooms around the school, scientists, inventors, and tech leaders discussed an array of innovations happening in our backyard, from the use of satellite technology in agriculture to cutting edge discoveries within our skin microbiome. It was an evening of fascinating learning and engaging hands-on activities.





SPEAKERS AND PRESENTERS, OCTOBER 2019

Alia Atlas, Tech Lead/Manager, Google

Jacob Baker, Ph.D. candidate, Lieberman Lab at MIT

Bill Bing, Senior Vice President, Humatics

Peter Blake, Ed.D., Assistant Professor of Psychology and Director of the Social Development and Learning Lab at Boston University

Adrienne Card, Merrimack Valley Apiaries

Eamon Carrig, Founder & Chief Technology Officer, Autonomous Marine Systems

Subit Chakrabarti, Ph.D., Lead Data Scientist, Indigo Ag

RJ He, Vice President of Engineering, Optimus Ride

Nia Johnson, Harvard University, Mazingira Bioethics Group

Ned Kirkpatrick, Head of Microscopy, Novartis Institutes for BioMedical Research

Aimee and Noel Poirier, Collective Healing Center

David Potere, Ph.D., Head of Geolnnovation, Indigo Ag

Molly Scannell, multimedia artist

Orit Shaer, Ph.D., Human-Computer Interaction Researcher

Stanley Shaw, M.D., Ph.D., Chief Science Officer, One Brave Idea

Sankaran Ramakrishnan, Ph.D., Trancik Lab at MIT

Mithil Raut, Application Engineer, Silicon Labs

Conor Walsh, Ph.D., Gordon McKay Professor of Engineering and Applied Sciences, Harvard School of Engineering

Davide Zaccagnini, M.D., The Dalai Lama Center for Ethics at MIT

Snejina Zacharia, Founder and CEO, Insurify.com

Outdoor meetups: Building an authentic community during Covid

Students built shelters in the woods near Horn Pond. They investigated the nooks and crannies between the boulders of Panther Cave. They discovered a half buried treasure chest on a tiny island in the Fells. They scaled trees, played games, identified animal prints in the snow and tracked the progression of the seasons.

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During a time when students across the country are experiencing isolation and anxiety, Acera faculty and staff launched and led weekly outdoor “meetups” to give elementary and upper school students – be they hybrid or fully remote – the opportunity to see and connect with their peers safely, all while getting exercise and exploring nature.

These outings have been critically important for adults and students alike, intentionally becoming student wellbeing check-ins; teachers and counselors gained valuable insight into their students in person instead of through a computer screen. Kids savored being with each other in nature and getting out of breath on a hike!

From the start, the students had ownership over their meetups. They took turns deciding which places to explore and what games and activities to try. In a difficult year, these outings catalyzed authentic connections and a sense of belonging in each classroom community.





Acera staff use school's 3D printers to make PPE for health care workers

As Covid-19 shut down the Commonwealth in March, another issue came to the forefront: a drastic shortage of masks, face shields, and other equipment. Boston-area medical leaders made a plea to the public for more personal protective equipment (PPE).

Taking to heart the theme of Human Needs, and modeling our core value of Community, Acera's Josh Briggs and David Olson put their creativity and engineering skills to work making protective face shields through the school's 3D printers. Seeing the importance of rising to meet the moment, Acera contributed not only its printers but also the cost of the supplemental materials.

Three dimensional printers work by extruding molten plastic in layers, directed by computer control, over and over until a model is created. Following a medically-approved design, Briggs and Olson used the printer to build a visor and strap lock for each shield. An early challenge arose in sourcing the necessary parts. Normally found in hardware, fabric and office supply stores, the materials needed for the PPE was scarce.

"I spent significant time sourcing material from dozens of different online and in-person vendors so I could keep enough on hand to deliver roughly 50 face shields every three days," said Briggs. "I delivered every single one of those boxes to very thankful healthcare providers, on time and with the promised quantities!"

In all, nearly 400 shields were donated to Boston Health Care for the Homeless, Codman Square Health Center, Fenway Health, and St. Francis House.

"Social distancing isn't always possible due to the nature of our work," said a representative from Saint Francis House. "So the shields are the ultimate protection for everyone involved. Thank you!"

Pop-Up School brings hands-on, project based learning to public school students during pandemic

"It is Lord of the Flies, over here. I have a job, and I am not an educator."

"The assignments being sent by school do not engage my child. They don't fit him, and they are not interesting."

More than a month into remote learning, parents were expressing frustration and fear. Their primary concerns radiated around their kids' need for connection with other students, and a general malaise and lack of engagement.

An Arlington parent reached out to Acera to see if the school's start-up mentality and adaptive mindset could be applied, right away, to create a new remote schooling opportunity for kids not currently enrolled in its day program. The team at Acera thought that it could, and a Pop-Up School consisting of two cohorts of students in grades 5-9 began.

Pop Up School was anchored by daily, synchronous Zoom video discussions that focused on high-engagement interdisciplinary ideas and real world needs. Its goal wasn't to convey specific facts, but rather develop students'

capacities in critical thinking, problem solving, creativity and initiative. These daily meet-ups each morning created a norm of connection with a group of peers, and an opportunity to talk about things that mattered to the students. Afterwards, a daily schedule unfolded; a mix of individual work time, one-on-one teacher appointments for coaching, and time for online math tutorials, exercise, and video chats where students could connect, socialize, and play games.

Within weeks, we were hearing from parents and kids alike that our Pop Up students were engaged, motivated to learn, and – perhaps most important of all – happy.

Conventional wisdom kept insisting that remote learning would be abysmal. Pop-Up School showed that when it is well-designed – and led by teachers who focus on facilitating students' dialogue and growth in thinking – students engage and discover their capabilities. Remote learning can be highly successful.



I am thinking creatively in new ways because of the way the teacher prompts me, and I am doing assignments with approaches I would not have imagined!"

— Grade 6 Pop-Up School student



“

Our daughter has an energy and focus she has not had in weeks.”

— Pop-Up School parent.



BEFORE

COVID

INTEGRITY

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Be accountable: do what you say you will do, and do the right thing. Make decisions based upon your values. Honor yourself and your own personal potential by challenging yourself to do your best. Use your judgment and do what is right. Develop self-awareness and knowledge of boundaries.

Elective on Apartheid and social justice inspires student-led activism coalition

It is often assumed that events taking place on two different continents involving two different people are entirely unrelated – that each should be viewed strictly within its own specific context. At Acera, however, such events are viewed as opportunities to build systems thinking and critical thinking capacities. Having grown up in apartheid South Africa – and then witnessing the prevailing segregation in the United States – Acera's Esteé Hill created a curriculum that allowed students to view both systems through the lens of education inequality.



These four words perfectly encapsulate my time at Acera: You will be found."

— Ash, graduating Acera student



The students compared the events in South Africa and the U.S. through a critical analysis of the context and beliefs of social justice leaders Nelson Mandela, Martin Luther King Jr., Malcolm X, and Steve Biko. They examined the development of the 'truth commission' in the aftermath of World War II and the 1948 Universal Declaration of Human Rights, followed later by South Africa's Truth and Reconciliation Committee after the abolishment of apartheid in 1994. Students also delved into the U.S.'s efforts to use busing to achieve school desegregation in the decades after the Brown v. Board of Education Supreme Court decision. They analyzed how and why busing became one of

the nation's most controversial civil rights issues, and why racial inequality still thrives in schools today. As a culminating project, students recorded and produced a podcast for NPR's student podcast competition.

As the elective came to a close, a group of middle school students were inspired to continue to meet to discuss social justice issues. As the Acera Activist Coalition, students created their own newsletter, wrote opinion pieces, produced podcasts, and planned and implemented a march and rally to recognize the one year anniversary of the murder of George Floyd.

Necessity as the Mother of Invention

We invented many strategies to stay true to our philosophy of student choice, high engagement projects, and robust invention of timely curricula; concurrently, we implemented 11 different layers of Covid safety precautions. We leveraged reduced building density, masks, distancing, cohorting, hygiene and cleaning, ventilation, Covid testing and more. With dogged determination, our teachers innovated to embrace outdoor classrooms and other new needs into opportunities for invention.

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We adapted our staffing model and interdisciplinary projects to a “pentamester” model of five different sections, over the year, in which we could cohort specialist teachers with different classrooms, hence offering diverse learning experiences and hands-on opportunities in spite of our decision to limit in person instruction in rigid ways around class groups. This approach enabled a plan for conversion to all remote if needed, based on risks of covid cases. With each new pentamester, a new set of student choices were offered, prompting a whole new model for and reorganization of staffing. This was the only way to keep alive our choice-driven and hands-on rich approach in spite of the safety protocols we took on this year.

We maintained a series of interwoven programs through the 2020/21 school year, which evolved to allow responsiveness to mental health needs, concerns of increasing Covid cases in winter, and vaccine rollout success in the spring.





- An outdoor, full day experience four days per week for our youngest students at the start of the school year shifted to an indoor classroom five days per week in November.
- Hybrid classrooms, with in-person learning three days per week, for students in grades 2-5.
- Hybrid classrooms, with in-person learning two days a week, for upper school students grades 6-9. A third in-person day was added in October.
- All-remote elementary and upper school classroom options –grouped into age appropriate cohorts – with optional weekly in-person meetups for outdoor games or a hike.
- Options for all elementary and upper school remote students to merge into outdoors recess, hands-on electives, and creativity stations.

We added three additional core classrooms and teachers to accommodate all the specialized requests in ways that had integrity across age bands. We also added three math teachers to make ability-based math classes even smaller – with an average size of six students – and two literacy and executive function specialists to account for all remote and hybrid learning needs.

For most of the year, in-person students spent nearly half their school time outdoors. Two new carport structures were erected on our playground, with a series of pop up tents to offer additional shade and shelter when needed. Electives leveraged a nearby waterway, parks, and the Fells Reservation, enabling us to pivot to outdoors for safety, but in ways that expanded our ecology and environmental sciences offerings, and engaged nature-based learning in new ways.

As the school year began, we had to reimagine group projects due to distancing needs and risks of shared materials. How did we handle that? In one class – in which kids typically build a boat together – it was led in such a way that design/ redesign prototype testings occurred on an individual basis, and each student built their own smaller boat in an outdoors carport-covered classroom. redesign prototype testings occurred on an individual basis, and each student built their own smaller boat in an outdoors carport-covered classroom.

LEADERSHIP

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Model our beliefs within our actions. Allow others to take ownership; empower others to become their best selves. Inspire a shared vision about what is possible. Listen to others. Find your inner tenacity; be flexible and resilient. Face difficult situations and make tough decisions with integrity. Earn the trust of others.

BEFORE

COVID

Pyne Arts and AceraEI

AceraEI, the nonprofit public school outreach program of Acera School, supports public school teachers to grow their practice, to engage teachers as change agents, and to catalyze education innovation within public school districts. AceraEI is certified by the Massachusetts Department of Elementary and Secondary Education (DESE) to offer Professional Development Points (PDPs).

The Pyne Arts first grader wasn't satisfied with the results of her first experiment.

"I added a big water and a big glue the first time, and I did three small Borax," she noted, having written her first "recipe" down on her clipboard. "But it was slippery and hard and too bouncy. I realized that I added too much water and I needed a little bit more Borax. So the second time I did a big Borax, three small glues, and three small waters. I like the second slime better than the first slime."

The hands-on STEAM activity "The Choreography of Matter" was a half-day, whole-school event held at the Pyne Arts K-8 public school in Lowell. During the activity, students experimented with different recipes of their own making, in search of what they considered the "ideal homemade slime."

As part of AceraEI's three-year partnership with Pyne Arts, the school is implementing a curriculum – created and pilot tested at Acera's lab school – that promotes scientific thinking, inquiry, and creative problem solving. The partnership is built around AceraEI's commitment to free professional development and support to Pyne, with the intent to spread successful efforts throughout the district.

In building to events such as the half-day “Choreography of Matter,” AceraEI provides training in the lesson plan and activities with Pyne Arts’ STEAM Team, a cohort of teacher mentors who then train the rest of the faculty. As the teachers learn the new hands-on content, they collaborate on ways to weave the activity into the current curriculum.

For the half-day activity “Enchanted Electronics,” for example, Pyne Arts’ kindergarten and first grade incorporation the circuitry into their unit on animals, guiding the kids in creating their own backpack keychain in the shape of their favorite animal that lit up via circuits they made themselves. Students in sixth grade biology designed and brought to life their own insect “superbug,” complete with electronic eyes or stingers.

“What I saw today when I walked around was a different level of enthusiasm,” said Crocker-Roberge following the Enchanted Electronics all-school activity. “I saw kids who were hyper focused, who were as engaged in their circuitry as they were in their art. They were taking learning that they had done previously and they were amplifying it. Teachers are taking their current lesson plans, which were already great, and intertwining them with STEAM education in much more organic ways that result in student work products that they have ownership over and that they are extremely proud of. The kids are holding themselves and their work to higher standards, and that is really exciting to see.”



My time at Acera has allowed me to do many different things. From creating a color-sorting gumball machine to starting a free tutoring program, I have been supported and cheered along the way.”

—Maria, graduating Acera student

A study of the Great Depression inspires one student to tackle inequality in education

The economics elective began with the fundamentals of microeconomics, including supply and demand, market structure, and pricing/profits. As the pandemic closed schools and restaurants and the country restructured around working and learning remotely, math curriculum coordinator and social sciences elective teacher Debbie Seidel chose to do some restructuring of her own.

“I knew that I couldn’t talk to the kids about economics without talking about how the pandemic is affecting the economy,” she said. “But I couldn’t address it head-on, because there was so much uncertainty; I felt like it would be too much.”

Instead, Seidell looked for a parallel in history, settling on the Great Depression. They discussed the causes, the differences between the actions taken by Presidents Hoover and Roosevelt, and – through the lens of history – analyzed what kinds of governmental responses were helpful when the economy is struggling.

In one activity, students worked collaboratively to balance a 1930 budget. Acting as President Hoover's staff, students were given actual numbers on revenue and spending, as well as details regarding which programs were supported by federal dollars and which were supported by the state. It was during this project that student Maria Zacharia made a discovery about public education.

"The big spark moment for me was when we were discussing how property values are used to determine how much funding schools receive, and I don't think that's how it should work," Zacharia said. "But since I'm a kid and can't go to the government to say 'fix this now,' I did some research on what I could do to help."

Her research led her to the organization KodeConnect, which offers free science classes to students in Brockton, Mass. Inspired by the concept of tutoring kids who needed help, Zacharia galvanized her classmates to volunteer as math tutors and began reaching out to area school superintendents. In Woburn, assistant superintendent Michael Baldassarre responded.

"That was a very happy moment," Zacharia said. "He asked for a flyer to share, and my fellow tutors and I created one. Pretty soon we were tutoring kids on Zoom."

Today, through her leadership, 10 Acera students are virtually tutoring 15 kids in grades three through six. And the program is one she is committed to continuing as she makes the transition into high school.

"Maria was always looking at the causes and effects and always thinking big," said Seidell.

When students are empowered to see needs and step forward to make a difference, they can realize a vision for change and combine the contributions of others to bring it to life.

AFTER

COVID

Acera's Michael Hirsch named educator fellow for National Public Radio's Science Friday

On a Friday in October of 2020, there was a buzz of excitement at the school. Acera Lab Sciences Specialist Michael Hirsch had joined National Public Radio's Science Friday to discuss – along with a cohort of fellow teachers from across the country – what it was like to teach during a pandemic. Hirsch was participating in the conversation as one of Science Friday's new Educator Fellows.

Hirsch is one of seven science teachers selected from hundreds of applicants, and he is the only teacher from Massachusetts chosen to participate. The cohort of educator fellows work with each other and with other scientists to conceptualize and create educational resources that are free for teachers and aligned with Next Generation Science Standards.

"It's been great to meet and collaborate with teachers from around the country in a wide variety of settings; it really shows what is possible for science education and all the different ways that it can be done," said Hirsch. "Plus, when science teachers work directly with scientists, they come up with amazing ways to take that experience and curate it for kids in the classroom."



This program synergizes with work he and others have done as part of AceraEI's Life Sciences Change Agent Teachers workshop series. As an educator fellow, Hirsch will take some of the curricula he has developed and taught at Acera – including labs on fermentation, gene editing with CRISPR, and the skin microbiome – and build them into a series of science units that teachers everywhere can access and implement in their own schools that will live on Science Friday's website under the Educate tab.

Also as part of his fellowship, Hirsch led a virtual panel discussion featuring polar research scientist Prem Gill at the most recent Science Friday Summer Institute. The goals of the Institute were to introduce science educators to scientists and their work, as well as amplify underrepresented voices in science in order to increase diversity in the science community. As Hirsch's involvement with Science Friday deepens, his role will evolve from educator fellow to educator mentor, where he will guide new cohorts of fellows and take part in additional Science Friday educator initiatives.

"Ever since I was in single digits, I wanted to be a writer," Hirsch recalled. "I love expressing myself through the written word, and the fact that I get to do it for Science Friday beautifully marries my passion for it with my never ending devotion to science."

Acera School Launches New Diversity Scholarship Program

According to the National Science Foundation, underrepresented minority students received 22% of all science and engineering bachelor's degrees and 9% of all science and engineering doctorate degrees in 2016. Last year, nearly 70% of all STEM professionals in the U.S. were white.

Acera is working to bring more BIPOC students into its hands-on, STEM community through a new diversity scholarship program. Through Acera pedagogy, students are able to draw connections between classroom learning and real-world innovations and issues. This early and deep exposure to STEM concepts makes science meaningful and enables students to see a pathway for themselves as future scientists and innovators.

The scholarship fund is the most recent program in Acera's efforts to increase diversity in STEM. Acera's public outreach division, AceraEI, leads free professional development workshops for public school science teachers – with an emphasis on teachers in communities with high student diversity. Teachers learn to implement new, cutting-edge lab experiences, including gene editing with CRISPR. The goal is for workshop participants to weave these hands-on lab activities into their existing public school science curriculum. To date, more than 30 public school districts – including Boston, Lowell, Salem, Lawrence, and Lynn – have participated in AceraEI's free trainings, and teachers have used the curriculum in their own classrooms with students.



In August of 2020, AceraEI facilitated a free workshop for public school teachers on best practices to make remote learning substantive, hands-on, and engaging for students during the pandemic.

Acera School also manages the Reed Hollett Enrichment Scholarship Fund. Acera established the Fund in 2016 to ensure that lower-income students can participate in Acera's after school and summer STEAM enrichment programs. Reed Hollett, a beloved Acera teacher who passed away unexpectedly in 2015, believed passionately in the importance of getting children outdoors to experience nature.

Promoting health – and 21st-century skills – in schools

While most people wouldn't connect kids with cardiovascular research, a Boston-based partnership is working to change that.

One Brave Idea™(OBI) is an \$85M research and innovation initiative co-founded by the American Heart Association and Verily, with significant support from AstraZeneca and Quest Diagnostics. OBI was established to pursue unconventional scientific approaches in order to make major advances in the fight against coronary heart disease. Dr. Calum MacRae, MD, PhD – Vice Chair for Scientific Innovation and Associate Professor at Brigham and Women's Hospital and Harvard Medical School – recognized that learning more about cardiovascular health and wellness in youth was important to OBI and sought out a partnership with the Acera School to facilitate K-12 involvement at scale.

In Fall 2020, Acera piloted the Measures for Health in Schools (MHS) study at both its lab school and at Salem Academy Charter (SAC) in Salem, Mass. The study involved cutting-edge, standards-aligned science, technology, engineering and math (STEM) curricula and positioned youth both as researchers of and contributors to real, impactful research. Through OBI's funding, Acera developed activity guides for remote or hybrid classrooms, provided remote instructional training, and Fitbits to students and parents who consented to participate. The study explored the associations between activity, heart rate, sleep, emotional states, and student experiences of pandemic-era schooling. Data was collected through app-based surveys triggered by time of day.

Both study participants and non-participants engaged in curricular activities on cardiovascular health, wearable technology, and data analysis. Students learned about heart anatomy, standard measurements from a physical exam (e.g.: BP, BMI, LDL, HDL), common cardiovascular diseases, and understood the relationship between heart rate and activity.

The wearable technologies session introduced students to the growing field of wearable technology in and beyond health applications. Students were asked to consider questions about what wearable technology is and how it impacts people, and how it can benefit our own health and help us build our quantified-self — a data-driven self-portrait of one's own health data. Students demonstrated their knowledge of wearable technology by generating ideas of devices that can help people.

Finally, students explored key ideas for thinking statistically and visualizing data. Using de-identified data sets, students learned how to bring interesting, meaningful features out of data. Students developed insight into the relationship between body and mind, while developing 21st century skills and awareness of health-promoting behaviors. The intent? Students become more scientifically capable and recognize how to manage their emotional states and overall wellbeing.



Thank you for creating a place kids can't wait to go back to! Thank you for giving our kids an unparalleled advantage – the ability to question, create, reflect, wonder, share, inspire, care, lead, and so much more!

— Acera Parent

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*Full-time Acera Staff for the 2019-2020 and/or 2020-21 school year. Additional part-time staff not listed here include math, computer science, and creativity morning teachers.



BOARD OF DIRECTORS

Acera's Board of Directors has as its foremost charter to safeguard the fiscal stability and sustainability of the school. Its approach is modeled more after the for-profit sector than the typical non-profit board approach, enabling the rapid and flexible growth of a start-up school.

Courtney Dickinson, B.A., CHAIR
Founder & Director, Acera School

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Under Jane's guidance, the CSW has emerged as a true leader in progressive 9-12 education

— Courtney Dickinson

Jane Moulding joins Acera Board of Directors

In the 2019-2020 school year, Acera welcomed Jane Moulding to its Board of Directors. Moulding is a principal at SmarterWisdom Consulting, and served as Head of School at The Cambridge School of Weston (CSW) from 2002 to 2019.

At SmarterWisdom, Moulding partners with leaders, especially emerging leaders, to help them tap into their own wisdom, and the combined wisdom of their teams. During her time at CSW, a leading progressive high school located in the Boston area, Moulding lived and modeled effective team building, strong mentorship systems, and sustainable leadership. She was instrumental in transforming and expanding the school's academic programs while developing and deepening interdisciplinary curriculum within a learning environment devoted to the arts and creative problem-solving.

"Under Jane's guidance, the CSW has emerged as a true leader in progressive 9-12 education," said Courtney Dickinson, founder and director of Acera School. "We are honored and thrilled that she is bringing her depth and breadth of educational leadership to Acera."

Moulding grew up and attended university and graduate school in the UK, and she completed a masters' degree at Harvard University Extension School. Her teaching career brought her to the UK, The Netherlands, Tripoli, Libya, and, finally, Boston. She transitioned from teaching to school administration and leadership as a dean of faculty at a Boston area independent school, and later as the director of the middle school at Buckingham Browne and Nichols School in Cambridge.

According to Moulding, Acera School's progressive mission and emphasis on science, creativity and leadership made participation on its board appealing.

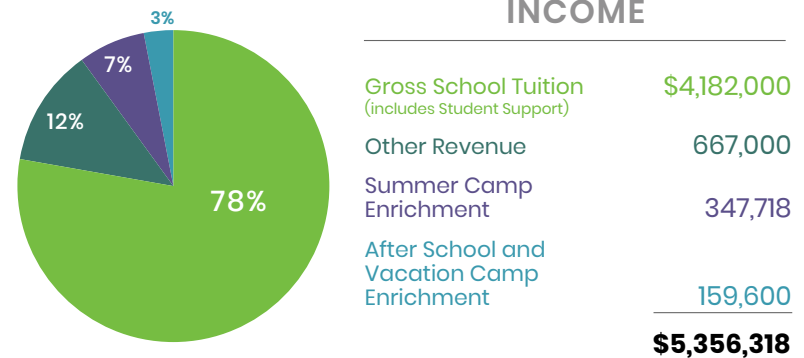
"Having an opportunity to sit in on a faculty discussion meeting was a fantastic experience, what an impressive group!" Moulding said. "I am hoping to use my deep experience in schools to be a partner to the school's leadership and ensure that people in the Greater Boston area know of this gem of a school. Courtney Dickinson is dynamic and inspirational. She has an authentic desire to create partnerships that not only further the mission of the school but also advance her hopes and dreams for student learning in public schools."

ACERA SCHOOL FINANCIALS 2020-2021

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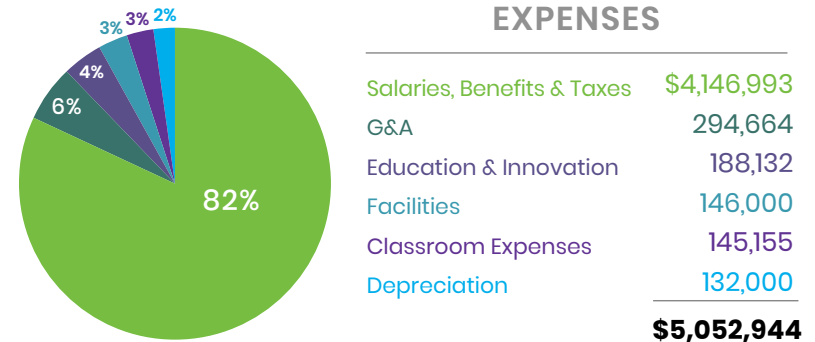
Since its beginnings in 2010, Acera has been a bootstrap start-up that provides an exceptional educational experience for all students. Tuition accounts for approximately 80% of the targeted budget; the remainder of the operating budget is raised each year through generous donations from our families, friends, and funders and through our STEAM Learning Lab enrichment programs throughout the year. We are actively building our network of academic institutes, corporations, collaborators, and foundations, enabling expansion of our Innovation in Education mission.

INCOME



*AceraEI's public school partnerships are not funded through Gross School Tuition

EXPENSES







As I look back over the last six years, what stands out to me most is that I was able to fail without fear. I was able to learn to take risks because I didn't feel that perfection was the only option. The supportive core values at Acera have created a unique environment that I was able to thrive in."

— Skylar, graduating Acera student

If you are interested in becoming a curriculum collaborator or would like more information on investing in Acera's work in education, please contact:

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