

**Increasing Access to Math Learning for ALL: NEC's Flagway Math Literacy Initiative**

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**Abstract**

This participatory action research study describes the Flagway program at New England College. The purpose of the study is to share the historical origins of the Flagway program that is rooted in the youth leadership of the civil rights movement, discuss how Flagway is being implemented with college students at New England College, and describe the program's initial effects on middle school students who score in the bottom quartile on mathematics achievement tests. The study focuses on one small New Hampshire college's role as one of many "little springs" sprouting up as part of a larger national youth voice movement to expand access to math education and literacy, which has historically been denied to students of color across the United States. In this article, we describe the development, implementation, and initial impacts of the program using a participatory action research design. The study also demonstrates how this college, with an enrollment of predominantly White students, is collaborating with several nonprofit, social justice-based organizations to provide college students with opportunities to develop critical and antiracist thinking, cultural competence, and skills as math literacy workers. Through the use of qualitative data collection methods (i.e., storytelling, interviews, photographs, and observations), data are shared to provide evidence that the program is helping college, elementary, and middle school students build their competence and confidence as math learners and antiracist leaders.

*Keywords:* Flagway program, systemic racism, eugenics movement, math literacy, generational wealth

**INCREASING ACCESS TO MATH LEARNING FOR ALL: NEC'S FLAGWAY MATH  
LITERACY INITIATIVE**

This participatory action research (PAR) study focuses on New England College's (NEC) effort to develop culturally responsive programs (Ladson-Billings, 1994) and pedagogical practices to meet the needs of our college students. Participatory approaches to research engage those people or groups who are most affected by an inquiry as partners in a process of research and action. By adding youth into the PAR process, research is done in partnership to inform solutions to problems that young people care about.

Teachers in this study invited their students to “own a piece of the problem” of working to ensure educational equity and access to effective mathematics instruction for ALL students. Results from this study describe how a student-led, community-based, math outreach program called Flagway is providing learning and leadership opportunities for NEC's increasingly diverse student population. The PAR study demonstrates the ways in which our college, which enrolls students who are predominantly White, is looking inward and reaching out to help local schools address the needs of diverse students, especially those groups of students who historically have struggled to learn math. As NEC helps others to become more culturally responsive and proficient, we are learning and growing as a college community.

The Flagway program at NEC focuses on the question, “Is quality education, and math literacy for ALL students, a civil right?” The inspiring leader whose work is at the center of NEC's program, is Robert “Bob” Parris Moses. Moses began his work as a civil rights leader when he traveled south from New York City in the 1960s to get involved in the civil rights struggle. Initially, he began working in the offices of the Southern Christian Leadership Conference (SCLC) led by Dr. Martin Luther King, Jr., but he soon met Ella Baker and other young activists who had joined together to form a youth-led organization called the Student Nonviolent Coordinating Committee (SNCC).

In the book, *Radical Equations* (Moses and Cobb, 1981; 2001), Moses wrote:

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Although I'd come to Atlanta with the intention of working for SCLC, I had little to do and found myself gradually moving in a direction I couldn't have anticipated—toward SNCC. There'd been no mention of SNCC in the New York SCLC office. The students may have been uncertain about their long-range plans then, but at least I could involve myself in their process. (p. 35)

SNCC's approach to leadership was fundamentally different than that of SCLC and Dr. King. Moses and his fellow organizers in SNCC learned from another important civil rights leader, Ella Baker, in the way in which she created the space for young people to bring SNCC into being, they passed it on and replicated it in their work with Mississippi sharecroppers around the right to vote. The belief that enacting leadership by creating space for, processes for, and organizing others to be leaders is embedded in the DNA of the leadership model that grew out of SNCC and that became the guiding principle of Moses's civil rights work and his organization, the Algebra Project. This legacy of youth voice and creating space for young people to dream and work together, to organize and lead themselves, is also the story of the founding of the Young People's Project (YPP) and at the heart and soul of the creation of Flagway.

Since his early work as a voting rights activist, in the 1960s, Moses has taken the lessons he learned from Ella Baker, SNCC, and their voting rights organizing work in Mississippi about amplifying youth voices, grassroots leadership, and activism for social justice into schools and communities across the United States. With an emphasis on providing access to math literacy for students who have historically been denied access to quality mathematics education, Moses created the Algebra Project (2020) in 1982 with the money he received when he was awarded the MacArthur Genius Award for his efforts to link his civil rights activism to the critical need to ensure all students have access to math literacy. The Algebra Project develops curricular materials and trains teachers and teacher-trainers to provide ongoing professional development and community involvement activities to schools.

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Moses went on to create the Flagway Game in 1992, which we will discuss in detail later, and he wanted to apply the principles of youth voice and leadership that he had learned with SNCC to create a space for Flagway to take hold, grow, and flourish. This is how his daughter Maisha Moses (personal communication, Feb. 3, 2021), the current Director of YPP, described how YPP was formed in 1996:

Bob did not form or found YPP. He challenged the young people, his children included, to "get their act together," and he created the space for it to happen. He left it up to the young people to decide IF they wanted to do it, if they WOULD do it, IF they could figure out how to make it work. He resisted the push and pull from adults in the Algebra Project to form a youth arm of the Algebra Project, and to do it for the young people, or to make it happen faster, or different, or better. In doing so he was channeling Ella Baker, who fought Dr. King and the SCLC leadership to create the space for SNCC to grow itself as an independent organization and not as an arm of, or extension of, or subgroup of SCLC. So, in 1996, YPP was formed and founded by nine 8th graders, Algebra Project students, from Brinkley middle school in Jackson, MS and 3 Black men in their early twenties, from Cambridge, MA.

Bill, one of the authors of this article, was fortunate to be invited by Bob Moses to participate in the early development of the Alliance in 2016 and 2017, because they shared a mutual commitment to amplifying youth voice and leadership, as a key strategy for promoting social justice through transformative educational reform. Since then, NEC faculty and students, have been privileged to have worked closely as learners and partners with Maisha Moses and her staff at YPP to try to provide space and encourage NEC students to develop a student-led organization at New England College. This group will learn how to co-design, create, and lead to help all students gain access to effective math education and the opportunities that math literacy will open up for young people who have typically been marginalized by their schools.

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The central premise behind this work is that math literacy is fundamental to getting a quality education and a decent job. We are living in the Digital and Information Age of the 21st century. Just as the literacies of reading and writing were essential for getting a good job in the Industrial Age of the 20th century, Moses has taught us that math is a new “basic literacy,” (1981) which every child will need to develop to have a real shot at gaining access to a good education and a well-paying job. Math literacy, especially for children of color, will open up vast new educational and career opportunities, and thereby allow each child to gain access to living a happy, healthy, life, and equitably engage in the pursuit of happiness in the 21st century.

*“We hold these truths to be self-evident, that all men [people] are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.”* **United States Declaration of Independence (1776)**

### **Flagway: A Gateway to Math Literacy**

This study documents the development and implementation of YPP’s Flagway program and NEC’s role in expanding the program in New England. Flagway is a game-based, hands-on, highly competitive, physical math learning game designed to be led by young, near-peer student coaches or mentors who take on the roles of math literacy workers (MLWs).

Those of us who believe in the power of Flagway reject the biases and mindset of “adulthood”—the idea that adults know it all, should always be in charge, and have the right to exert their powers to dominate, tokenize, and manipulate young people (Fletcher, 2015). Maisha Moses (personal communication, Feb. 1, 2021) described the essential role that young people of color have played in the historical and current work of YPP and Flagway:

After thinking about the Möbius Function for two years Bob Moses realized that it could be physicalized and turned into a game that young people could play to learn and practice their numbers. He worked with YPP, which was still in its infancy, and with

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students in The Algebra Project, to further develop and bring the game to life. From the beginning, Flagway was popular. After receiving a patent on the game, he gave exclusive rights to YPP to develop and disseminate Flagway. He said that he wanted Flagway to go out into the world through the culture of the black and brown kids Flagway was intended to reach, with their handprints and footprints all over it, and not to become something that the dominant culture takes ownership of, then returns back to black and brown kids, in the process becoming something they consume rather than something they have an integral part in developing and creating. Since then, YPP has worked to stay true to this vision through a 25-year R&D effort to develop Flagway with young people: how it's played, what games are played, how it's sequenced, how it's taught, all in the context of YPPs near peer instructional model with YPP MLWs and students. I think this is very important, perhaps one of the most important parts of the story. Flagway is designed to be something that young people do with each other, through a near peer learning model, as a tool to help young people whose educational and economic prospects have been confined and restricted to the lowest level of America's democratic caste system to work together to struggle and build demand for quality and equitable education for themselves and for all children.

Since those first meetings of the Alliance, our NEC students and Bill, an education professor at NEC, have received several years of training from YPP. YPP trains young people from middle schools, high schools, and colleges to become MLPs and has shared the values and philosophy of Moses and SNCC with our students and Bill. The organization has taught us ways to help elementary and middle school students learn how to play and ultimately lead a set of math and team building games needed to play and compete in the Flagway Game.

NEC is one of dozens of colleges and universities, nonprofits, educational leaders, and student voice and advocacy groups that came together as Moses and many others formed the

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We the People – Math Literacy For All Alliance. Through this work, we hope to address the failure of our schools and our nation to serve the needs of so many of our young people.

In this article we will critically examine the historical problem of educational inequity in the United States by sharing important stories from the past that have shaped the field of education today in ways that contribute to educational inequality. We explore the ways in which science and math have been used to institutionalize racism and classism in our nation's policies and institutions. This exploration will lead to a deeper understanding of and discussion about the philosophical and theoretical roots of the Flagway program, through an examination of the critical role of youth in this work, and how youth leadership and student voice (Mitra & Gross, 2009) serve as key components of the program. The first section of this article further describes the "Arc of Flagway," which summarizes the mathematical skills and concepts the program helps students to learn by playing the Flagway game. Finally, the first section examines how NEC became one of dozens of "little springs" that have popped up across the country, as Bob Moses, the Algebra Project, YPP and The We the People Math Literacy for All Alliance taught us to take ownership of the problem of educational inequity.

The second portion of this PAR study discusses the ways in which the values, key concepts, and challenging ideas about youth voice, antiracism and cultural competence were presented to NEC students as part of an NEC undergraduate, service-learning course called, *Is Math Literacy a Civil Right?* We discuss the Flagway training NEC students received from YPP to prepare them to take on their roles as MLWs and how these youth voice- and service-learning-based pedagogies fit within a philosophical and pedagogical framework that aligns with culturally responsive pedagogy.

In the final section, participants share stories and qualitative evidence demonstrating some of the visible effects of the Flagway program on NEC students and the elementary and middle school students with whom the NEC students and their YPP partners worked in 2019 and 2020. From this work, and the results of this program, we have developed a set of

recommendations for continuing to expand and influence the educational policies, practices, and priorities that must change if educators expect to reduce the gaps in educational, economic, and quality of life opportunities for marginalized students. We also propose several key steps that can refocus our nation's commitment to ensure educators more fully address the human needs and rights of all children.

### **Background of the Problem**

The problems Flagway has been designed to address are deep and wide. This article cannot do justice to or offer a full discussion of the problems that have led to the need for this program. Rather than attempting to list or show evidence of the many factors that have contributed to the problems of racism and social and educational inequality in the United States today, we have chosen to share a crucial story that captures the essence of problems that began more than a century ago, which still impacts the lives of American children, schools, and society.

### **The American Eugenics Movement and the Mismeasurement of Intelligence**

According to Buche and Rivard (2014), the United States has an imperfect history. They have stated that some of our darker chapters include slavery, the decimation of Native American populations, and atrocities committed during our various wars. They have found that most Americans have learned about or at least heard of these events. However, when they surveyed people about their knowledge of our nation's history, they found that most people have no knowledge or understanding of the American Eugenics Movement and how it has shaped our nation.

The problems Flagway seeks to address can be boiled down to a problem with numbers: the meaning, uses, and power of numbers to change people's lives, for better or for worse. There is one specific number that has been reified, or made so important, that it has taken on an especially powerful role in U.S. society and people's lives over the last century. That number is the IQ, or intelligence quotient. But it is not so much that the IQ itself is at the heart of the

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problem. It is just as important to understand how the creation of the IQ score is intertwined with the problem of social and educational inequality, and how a social movement vaguely familiar to most of us, the American Eugenics Movement, made a lasting imprint on the thinking, school practices, and lives of many Americans (Gould, 1981, 1996).

The term eugenics stems from the Greek word meaning “good” or “origin” or “good birth.” The term was coined by Francis Galton, cousin to Charles Darwin. During the early 1900s, the Eugenics Movement took hold in communities across the United States and Europe. These ideas about improving the natural, physical, mental, and temperamental qualities of the human family (Norrgard, 2008) became viewed as wholesome, sensible, and socially desirable.

These ideas, which were refined, spread, and nurtured in the United States during the early years of the 20th century, also became the underbelly of the White supremacy movement and eventually spread to the National Socialist, or Nazi, Party, which rose to power in Germany. We are all familiar with the principal ideas of the Eugenics Movement, ideas like genetic superiority, selective breeding, the elimination of undesirable genetic traits, etc. (Fendley, 2020). The implications and effects of these ideas were revealed to the world, in all their horror, toward the end of WWII, but these ideas have been commonly associated with Hitler, not the United States.

No wonder the American Eugenics Movement and the ideas of genetically based racial supremacy lost face and dissolved from U.S. history after WWII, once the world saw their power to destroy common decency and rationalize the killing and marginalization of entire peoples. We wish to share another story that preceded the rise of Hitler and the Nazis in Germany, the story of the history and growth of the standardized testing and intelligence testing industry in the United States. This story will, we hope, offer some important links between this faded history of the American Eugenics Movement and the power prejudice and mathematics have had to shape people's lives.

***The Story of the IQ***

For more than a century, predominantly white American educational and psychological researchers have used “science” and “data” to develop an immensely powerful and profitable “intellectual and psychological testing” industry (Benson, 2003). Ask any American student about their experience with testing, and you will get an earful!

Tests are used for everything. Academic testing is pervasive in schools for nearly all subjects and skills. Personality tests are used in business and industry to choose the right workers. Dating sites use tests to help people find their soulmates. People must pass tests to become teachers, doctors, lawyers, massage therapists, nurses, police officers, or citizens. Taking tests to prove one’s mettle has become a normal, natural, and inevitable expectation in our culture. What most people do not know is that the historical roots of psychological, intellectual, or cognitive testing in the United States was one of the foundational pillars and tools of building a “meritocracy” in the country (Appiah, 2018). This notion of U.S. meritocracy promised every person would have an equal chance to an education and positive life chances based on their personal merit rather than family ties and influence, but the notion of merit never strayed far from deeply engrained beliefs and practices associated with systemic racism (Appiah, 2018).

Many of the most influential scientists who created these tests were motivated by explicit and implicit biases and beliefs about “heredity and race” that stood at the center of the American Eugenics Movement. Tests and mathematics were used to “empirically demonstrate” the “innate” superiority and inferiority of specific racial and ethnic groups, immigrants, and children (Gould, 1981).

The first standardized tests were developed by Alfred Binet in France. A small but powerful group of intelligence scientists brought Binet’s standardized tests to the United States at the dawn of the 20th century. H. H. Goddard, L. M. Termin, R. M. Yerkes, and others took

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these new tools of psychological and intellectual “testing” and “misapplied” them, according to their original inventor (Gould, 1981, 1996).

Binet (1911) had devised his cognitive assessment tools and procedures for “formative” educational purposes: to identify individual student’s cognitive strengths and deficits, at a given time, for the purpose of diagnosis and remediation by schools and teachers. These same assessment tools, in the hands of these American scientists, were used from the very beginning to “scientifically” evaluate, judge, sort, label, and discriminate against people of color based on what they viewed as fixed—or genetically predetermined—levels of intellectual capability. These practices dramatically betrayed Binet’s intentions for the use of his original tests, which were to evaluate, intervene, and improve student intellectual abilities through education. Binet’s (1911) own words clearly make this point:

Some recent philosophers seem to have given their moral approval to these deplorable verdicts that affirm that the intelligence of an individual is a fixed quantity, a quantity that cannot be augmented. We must protest and react against this brutal pessimism; we will try to demonstrate that it is founded on nothing. (p. 141)

According to Gould (1981, 1996), after learning of Binet’s breakthroughs in cognitive testing in France in 1908, Henry Goddard translated the Binet-Simon Intelligence Scale into English, so he could use the test on his own psychiatric patients, as director of research at the Vinland School, a training school for “feeble-minded” girls and boys. Goddard’s use of these tests was shaped by the fact that he was a devout Eugenicist. He used these new tests to determine the levels of “feeble mindedness” or mental defectiveness of his patients. These scientific data could then guide and inform his decisions to place patients who scored in the lowest range of the test into asylums, or residential schools for the feebleminded, thereby permanently isolating them from society (Gould, 1981, 1996).

Many American cities and towns adopted Goddard’s approach. Eugenics-driven laws were passed in states and local communities across the United States to implement forced

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sterilization programs. Once-hidden lists of U.S. citizens, who were forcibly sterilized based on this logic, have been surfacing routinely in cities and towns across the United States over the last several decades. The promise and undeveloped talent of generations of children were exterminated under these forced sterilization policies and laws (Gould, 1981, 1996).

Another important breakthrough in the field of cognitive and intellectual testing came about in 1912. William Stern, a German psychologist, calculated the results of these cognitive tests to fit within a clear, concise, and easily understood mathematical paradigm. Stern took the scores of previous intelligence scales, then divided the subject's "mental age score" on the test by their "chronological age" and multiplied the resulting fraction by 100. Voila! The IQ score was born (Stern, 1914).

Once a person's total intellectual capacity could be captured and summed up with one simple, single number, it became easy to use this score to show which Americans were born "intelligent" and which were "unintelligent" human beings. This simple calculation, using the IQ score, combined with the ideology of eugenics, provided "scientific" fuel to stoke the fires of the Eugenics Movement and their beliefs about hereditarian roots of innate human inequality.

Goddard and his colleagues (Gould, 1981, 1996) had previously used the general term "mental defective" to describe mental disability or dysfunction in people; but, with the new IQ score paradigm, he introduced a clearer, more specific set of descriptive labels to describe those who fell along the intelligence continuum. "Idiots" were those poor souls who scored between 0 and 25 on the IQ tests; "imbeciles" scored between 26 and 50; and "morons" scored between 51 and 70. One surviving remnant of this era and the eugenicists are these three words: idiot, imbecile, and moron. Most kids today fully understand that these terms mean "stupid", and unfortunately, they still use these terms liberally, to attack and diminish those whom they view as intellectually inferior to them.

Lewis Termin (1923) further developed Binet's tests at Stanford and created the highly popular and still-used Stanford-Binet Intelligence Scale. Termin was a respected pioneer in the

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field of educational psychology and a well-known eugenicist. According to Appiah (2018), he was known for his studies of highly gifted students with “extreme talent.” Termin advocated for his intelligence tests to be universally administered to all children across the nation, to identify the “geniuses” among the population, and to develop plans to “socially manage” society using these data on the intelligence of U.S. citizens. Testing would assess “intellectual merit” and provide a rational way of screening young people for admission to higher education, whereas, previously, these decisions were made based primarily of family connections and ability to pay (Appiah, 2018).

Termin (1923) proposed dramatically different educational settings and opportunities for those with high and lower levels of intelligence and intellectual promise. Termin was responsible for the adoption of social and educational policies to control access to educational, vocational, and life-changing opportunities based on IQ testing. The higher one’s IQ score, the wider the doors of opportunity would be open. With access came the economic, social, and political rewards associated with those positions of merit, all made available by having the right test scores (Appiah, 2018).

But it was our final eugenicist, Robert Yerkes, who took the science of IQ testing and the ideologies of the Eugenics Movement to a national, systemic level. Yerkes began his college education at the turn of the 20th century in biology at Harvard. After graduating, he taught at Radcliff in the field of comparative psychology. Yerkes went on to take on influential roles as director of psychological research at Boston Psychopathic Hospital and served as president of the American Psychological Association (APA).

Using his influence as president of the APA, Yerkes and the APA were enlisted to develop several programs for the U.S. Army during WWI. They conducted the first large-scale psychological intelligence studies of more than 1 million soldiers in the U.S. military using their new Army intelligence tests. Yerkes and his coresearcher, Carl Brigham, reported their important findings back to the military brass, the U.S. Congress, and the entire scientific

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community (as cited in Gould, 1981). The Army tests supposedly empirically confirmed *the* innate intellectual superiority of white Americans. Their research also indicated there had been an overall decline in American intelligence, to the point where more than 47% of White draftees in the U.S. Army during WWI scored in the range of “feeble mindedness” on their tests. The studies confirmed levels of intelligence among Blacks and newer immigrant groups were even lower than these feeble-minded White soldiers (Gould, 1981).

Obviously, the numbers of immigrants coming to the United States at the turn of the 20th century were booming, due to the industrialization of the nation. Yerkes and Brigham (as cited in Gould, 1981) concluded the results of the Army intelligence tests showed the integrity and security of both the U.S. military and the nation itself were at risk due to the genetic intermingling of the races in the United States (Gould, 1981). There is an ongoing debate in the scientific community as to whether these scientists, and the use of their Army-based intelligence testing findings, were in fact the basis for the Immigration Restriction Acts of 1921 and 1924; but, regardless of their intent, these studies had a profound impact on the nation (Snyderman & Herrnstein, 1983).

In 1921, the United States shut its doors to the influx of Jews attempting to escape persecution in Eastern Europe. In 1924, The Reed Johnson Act expanded the bans to include Asians and placed additional dramatic limits on immigrants from Eastern European and all other nations.

People of color and other Americans living in poverty were cast in the same unfavorable light as these foreign immigrants. The eugenicist claims that Black and Brown and poor White Americans were cursed with defective genetic stock and that these groups were destined to remain at the bottom of U.S. society took root.

The notion of judging entire groups of other human beings to be inferior to yourself is the essence of racism. The persuasive power of science and (supposedly) easy to understand numbers like IQ scores were used as weapons by these respected and influential American

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figures to scientifically, and permanently, divide our society through the creation of a set of beliefs, institutions, and systems that remain firmly intact, in many cases, more than a century later.

Caroline Hodges Persell (1981) called the development of this hierarchical system of beliefs, and the social and institutional tools required to reinforce it, a “structure of dominance.” She described an American caste system that began with pervasive and powerful ideas, values, and beliefs associated with the racial superiority of White people that permeates the consciousness of the nation. Members of non-White subgroups are systematically singled out and continually subjected to routine and pervasive macro- and micro-level aggression. They are denied educational, economic, and personal access and opportunity. Too often, victims of this structure of dominance even begin to believe in their own inferiority. Persell claimed the pain and damage to people’s lives caused by this structure of dominance and its resulting social inequality in the United States is incalculable. This article examines newer models and theories of racial inequality and the ways in which race has become a permanent fixture in U.S. society, as we discuss how the work of Bob Moses, the Algebra Project, YPP, the We the People Alliance, and Flagway offer solutions for undoing some of this damage.

Charles Darwin (1839) said it best when he proclaimed in his influential book on evolution, *Voyage of the Beagle*, “If the misery of our poor be caused not by the laws of nature but by our institutions, great is our sin” (p. 500). We hope exploring this hidden history of the American Eugenics Movement, its influence on the development of the standardized testing industry, and the creation of racial hierarchies in the United States will provide a contextual lens that shows why educational and social justice programs like Flagway are so essential in our nation today.

### **Conclusion**

The purpose of this study is to share the results of NEC’s efforts to do something that may begin to help undo the historical marginalization of people, especially people of color.

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NEC's Flagway story provides a pathway toward hope, support, and access to educational opportunity for students who have a right to develop their full potential. This PAR study will demonstrate the effectiveness of Flagway and the ways in which NEC students have applied respectful, engaging, and culturally responsive pedagogical practices to help address these problems. It will also show in some anecdotal but important ways the initial effects of participation in Flagway on the learning of mathematics by students who have fallen into the bottom quartile on standardized tests of mathematics achievement.

### **Literature Review**

There are two important theoretical frameworks that provide a rationale for bringing the work of Bob Moses, the YPP, and the Flagway program to NEC. First, it is important to understand how a predominantly White institution (PWI) like NEC is developing and offering curricular and instructional options to empower our rapidly growing population of students of color and to demonstrate how this work fits within the traditions of culturally responsive pedagogy (Bell, 1992; Crenshaw, 2011; Delgado & Stefencic, 2001). Second, the cultural proficiency framework (Lindsey et al., 2019) adds important dimensions to NEC's efforts to raise its level of cultural awareness and proficiency, which will enable the college to support all members of our diverse educational community. This article will demonstrate the ways in which these theoretical frameworks and the Flagway program are embedded within the traditions of the civil rights movement; the ways in which YPP's Flagway program and NEC's work is centered around the essential element of youth voice; and how the empowerment of youth as leaders, mentors, and role models plays an essential role in successful social and educational change.

### **Critical Race Theory and Access to Math Learning**

Critical race theory (CRT; Bell, 1992; Crenshaw, 2011) is a broad intellectual movement with deep roots in critical theory, which has focused on Marxist, neo-Marxist, feminist, indigenous, LGBTQ, and emancipatory theories and research. Recent applications of CRT have

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focused on legal biases and barriers to equitable treatment of people of color. CRT uses critical theory to examine power relations in society and the ways in which social and cultural issues, especially social inequality, relate to race. CRT states White supremacy and White racial power are embedded in all aspects of U.S. society and are deliberately and systematically maintained over time. CRT examines the roles ideologies play in justifying and sustaining social inequality and the ways in which institutional, economic, and legal structures perpetuate inequitable access and lower levels of opportunity for non-White individuals and communities to support and sustain White power and supremacy (Delgado & Stefencic, 2001).

CRT critics sometimes point to the field as being overly negative and pessimistic; however, they make the point that stories of social justice, emancipation, and expanding civil rights, freedoms, and opportunities are essential messages associated with this field. Recent bestselling books, such as *How to Be an Antiracist* by Ibram X. Kendi (2019) and *White Fragility: Why Is It So Hard for White People to Talk About Race?* by Robin DeAngelo (2018) are being widely used by schools, business, and other organizations to challenge norms and habits in the workplace and schools to bring about new awareness of racism and much needed change.

In the context of this study, we use our understanding of CRT to assert that students of color whose families have been historically marginalized, disenfranchised, and denied equal access to educational, economic, health-related, and basic social services deserve and must demand equal access to educational opportunities, especially in the area of mathematics. Furthermore, we believe that programs like YPP, that provide spaces where students of color can co-create solutions to these problems are both needed and effective.

One of the villainous components of our entrenched and inequitable educational system has been to establish algebra as a gateway that disproportionately serves as a barrier to higher level math classes and higher education for non-White or middle-class students (Strauss, 2017). Algebra has historically been taught in highly traditional ways, using pedagogies that are not

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typically culturally, linguistically, or personally responsive to the unique needs of students of color, poor students, or many other students who struggle with math. For millions of students—especially students of color and certain groups of White students—access to the education system begins and ends with algebra. Algebra puts walls in front of these students in relation to higher education options and opportunity (Nicholes, 2020). This institutional racism translates directly into reducing financial earning power over the lifetimes of these students, which means they will have severely limited opportunity to gain generational wealth for their families. So, the cycle of poverty and lack of education and career advancement is sustained by these structures of dominance. Enabling students of color to overcome these barriers has been the essence of the work of Moses and the Algebra Project since the 1980s.

### **Cultural Proficiency**

Another important theoretical framework for this study is Lindsey et al.'s (2019) cultural proficiency framework. Cultural proficiency pertains to both individuals and institutions. Our work at NEC is an effort to build both the cultural proficiency of our college as an organization, as well as the cultural competence and proficiency of our students, faculty, and staff. The story of NEC's journey toward becoming a more culturally proficient institution of higher education goes something like this:

1. Although we would claim many of our cultural deficiencies have been unintentional, NEC has long served as an unwitting partner in the process of cultural destruction of people of color. The college was founded after WWII with an unabashed mission to provide access to higher education and career advancement for White, suburban, middle class men, from the Northeast, many of whom were initially returning veterans taking advantage of the GI Bill. Early on, NEC chose not to place much weight for admission on students' standardized test scores. This opened opportunities for young, White (mostly) men, to gain access to higher education and

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professional career opportunities through NEC. Little effort or attention was paid to enrolling people of color, and NEC developed as a PWI.

2. NEC has started to acknowledge what Lindsey et al. (2019) described as cultural incapacity and cultural blindness (p. 8). The NEC community is starting to see that our institution has been part of the historic, national enterprise of contributing to and sustaining racial inequity and injustice. We are recognizing that we have failed to understand and acknowledge racial and cultural differences that existed in our college's DNA—our recruitment procedures, financial aid practices, faculty hiring, student support systems, and pedagogy.
3. Now that NEC is more fully acknowledging these facts, the college is working to address these deficiencies and thereby entering a stage Lindsey et al. (2019) call cultural pre-competence (p. 8). The college is admitting a much more diverse student body. Administrators, faculty, staff, and our students are working to learn more about cultural competency, diversity, equity, unconscious bias, microaggression, and culturally responsive pedagogy. The institution is setting up infrastructure, new programs, and new staff and offices to support our students of color, and the college is collecting and analyzing data in new ways. Though our community has much work to accomplish to become a fully functioning, culturally responsive institution, NEC is committed to continuing our push forward to become more culturally aware, empathic, equitable, and competent, and to invite our students to join us in this work.
4. Over the next several years, NEC administrators, faculty, and staff will be committed to becoming increasingly "culturally competent," serving as effective advocates for ALL students and ALL people, especially those who have been traditionally underserved and marginalized. The retention and graduation rates for all students will continue to increase. Concrete steps will be taken to ensure that measurable changes will be seen for our students of color and that the climate and culture of the

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- college will become safer, more inclusive, and more welcoming toward and supportive of all students. NEC's president has assembled a college-wide taskforce made up of members of the senior administration, faculty, staff, and students to review all NEC policies, programs, curriculum, and learning opportunities for our students of color. The president and the board of trustees created five full-tuition scholarships in the name of George Floyd that will be awarded annually to diverse students to ensure the college provides additional opportunities for students of color to enroll at NEC, earn their college degrees, and enter the professional workforce.
5. NEC will continue to build its cultural proficiency, and these changes in philosophy, programs, and practices will begin to infiltrate deeply into our relationships throughout the community. Pedagogical practices will become increasingly personalized, culturally responsive, student centered, and tied to critical inquiry by creating empowering roles and authentic learning experiences and opportunities that allow students to identify and solve important problems together. NEC has determined to prioritize community outreach, and students will increasingly learn from and alongside respected national antiracists and equity leaders, as well as from and with their NH neighbors. NEC will share what it is learning locally, regionally, and nationally, modeling and advocating for antiracist policies, programs, and pedagogy in our region and state.
  6. The hope of the Flagway program participants is that NEC will continue along our current path toward becoming a national Flagway training center and play an important part in expanding a national Flagway League. The goal is for NEC to become a source of student learning about issues of social justice, educational equity, youth voice, and culturally responsive mathematics pedagogy. If NEC is successful, students will develop advocacy skills, agency, empowerment, and

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institutional pride as they work to address issues of educational equity and math literacy at the local, regional, and national levels.

This is how we view our pathway toward cultural proficiency at NEC.

### **Conclusions**

This literature review highlighted key theories and fields of research that have informed the design of this study and have served as the backbone of NEC's YPP Flagway initiative. Through integrating of these important ideas, this study will demonstrate how stories can communicate experiences and ideas and unlock the human imagination. The literature explored the connections between this project and critical race theory (Bell, 1992; Crenshaw, 2011), as we at NEC work to address historical and pervasive educational inequity in math literacy. This review of the literature has examined the important links between access to math, educational opportunity, and economic security. Finally, this review introduced the cultural proficiency framework (Lindsey et al., 2019) and applied that framework to the journey on which NEC has embarked. These theories have highly practical implications for the design and understanding of NEC's YPP Flagway initiative. Our intent is that readers will see these connections even more clearly in the following sections.

### **Methodology**

This study is framed around a PAR design, intended to provide a rich description of the work NEC students and faculty have been doing for the past 2 years to help address the problem of inequity in schools. The NEC YPP Flagway story highlights the challenges and opportunities at play when asking a group of predominantly White, middle class college students to assist groups of struggling elementary and middle school students of color in learning math. The research question this study addresses is "In what ways does participation in Flagway at NEC, affect elementary, middle school, and college students?"

## Research Design

There are several reasons why we chose to use a PAR design for this study. PAR is based in social justice (Kemmis et al., 2014). The goal of PAR is not only to improve problematic educational issues within a school and/or district and in education in general but also to correct issues of injustice and inequity in society. According to Efron and Ravid (2020), “The focus of participatory action research is on change, promotion of democracy, and equity. Its advocates take into account that teaching and learning are nested within political and social dimensions” (p.10). The goal of action research is to attempt to improve education through a systematic study of interventions developed to help students more effectively. PAR has the added goal “to unmask injustice and inequities, and to enhance practitioners’ commitment to becoming agents of change within the school and beyond” (Efron & Ravid, 2020, p. 12).

One of the most important developers of the concept of PAR was Paulo Freire (1970, 1998). Freire was concerned with the ideas that teachers were missing in their teacher training and research. His colleague, Donaldo Macedo, wrote in the foreword of *Pedagogy of Freedom: Ethics, Democracy, and Civic Courage* (Freire, 1998) that Freire contended:

Teaching requires a recognition that education is ideological.

Teaching always involves ethics.

Teaching requires a capacity to be critical.

Teaching requires the recognition of our conditioning.

Teaching requires humility.

Teaching requires critical reflection. (para. 3).

To teach democratic principles means, for example, educators must understand how and why, with all of the advances available in education and in society, so many students fail to be successful in school. Freire (1970, 1998) believed all teachers should teach to the freedom of all students. Freire (1998) wrote, “The educator with a democratic vision or posture cannot avoid in

his [their] teaching praxis insisting on the critical capacity, curiosity, and autonomy of the learner” (p. 33). When people said this ideal was a pipe dream, Freire responded:

I prefer to be criticized as an idealist and an inveterate dreamer because I continue to believe in the human person, continue to struggle for legislation that would protect people from the unjust and aggressive inroads of those who have no regard for an ethical code that is common to us all. (p. 116)

The goal of education—for teaching and for research—is to make the world a better place.

PAR was a perfect research design for this study because making society more inclusive and ethical toward all people, especially those whom society has left out, should be the goal of any educational programming and research. Students and their adult and near-peer mentors at YPP developed Flagway to help make education equitable in partnership with those students who have been left behind. NEC, as an educational community, is working to become an increasingly antiracist and inclusionary institution. This study will, we hope, represent an important step in this process.

### **Narrative Research Methods**

We chose narrative data collection techniques for this study for a variety of reasons. First, stories are a powerful way to share information. The practice of storytelling goes back to the very beginning of humanity; there must be some reason why storytelling has lasted so long as a form of communication, entertainment, and learning. Recent research, using magnetic resonance imaging by Yaun et al. (2018), reported in the *Journal of Cognitive Neuroscience*, indicated storytelling activates a section of the brain referred to as the “narrative hub.” The authors concluded “people adopt an intrinsically mentalistic and character-oriented perspective when engaging in storytelling, whether using speech, pantomime or drawing” (Yaun et al., 2018, p. 1310). This research provided further evidence that narrative communication reaches deeply into the human brain, causing strong cognitive and emotional responses. Wang and Geale’s

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research (2015) also suggested narrative inquiry has an underlying philosophy enabling the illumination of real people in real settings through the “painting” of their stories.

According to Wang and Geale (2015), narrative inquiry is important because it raises the voices of students who otherwise would have remained silent. The idea of amplifying the voices of students whose parents gifted them with beautiful names like Naveah, Aphasana, Momen, Serenity, Yahya, and Dheyaa suggests Flagway serves a population of American children who may often go unnoticed in their schools and communities or whose names may trigger unflattering and misguided stereotypes or mental images among White teachers or fellow students, which can only deepen their marginalization. Sharing the words, stories, and the profound learning of my mostly White, middle class, NEC students, whose parents gifted them with beautiful names like Taylor, Stephanie, Colin, Kayleigh, Thomas, Brianna, Cole, and Hayleigh helps to characterize the cultural “positionality” of my students, as their words convey what they have learned about educational equity, social justice, and their own naivete about the multicultural, pluralistic world.

Wang and Geale (2015) also explained that narrative inquiry employs storytelling as a way of allowing participants’ realities to be shared with a larger audience. Sharing the stories of middle school students, who live and attend school in one of New Hampshire’s largest cities, and students from NEC will hopefully engage and inspire others to begin to own a piece of these problems. Our hope is the stories shared in this article will inspire others to step up and take their place as antiracist advocates (Kendi, 2016, 2019) within their families, schools, and communities.

One powerful application of storytelling has been adopted within CRT research. Hartlep wrote in his 2009 review of research on CRT:

The idea of storytelling comes from its powerful, persuasive, and explanatory ability to unlearn beliefs that are commonly believed to be true. CRT calls this concept “storytelling” and “counter-storytelling.” This dichotomy—storytelling and counter-

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storytelling—is predicated upon the belief that schools are neutral spaces that treat everyone justly; however, close examination refutes this. (p. 10)

### **Purpose**

This study explored the pedagogical and personal experiences of elementary, middle school, and college-age students who participated in the NEC YPP Flagway program during 2019 and 2020 in diverse schools in one of NH's largest cities. We present qualitative research through narrative inquiry to amplify the voices of the elementary, middle school, and college students. This PAR study will hopefully communicate and inspire other colleges and schools to engage their students in strategies like Flagway to help them support math literacy and learning for all students in their regions, with a focus on students as partners in learning rather than objects of adult instruction or intervention. We hope that teachers and school leaders who read this article will see the value in moving beyond traditional, adult-driven, and curriculum-focused teaching methods and models. School leaders and teachers may begin to apply the power of near-peer mentoring, game-based pedagogy, or other culturally responsive teaching and learning methods to engage students who have traditionally failed academically in math and enable them to successfully and joyfully engage in rigorous mathematics learning.

### **Methods**

Over the past 2 years, NEC has worked with numerous department chairs, deans, vice presidents, directors of cultural diversity and inclusion, and several faculty and staff colleagues to launch a Flagway initiative at NEC. The NEC YPP Flagway program has engaged more than 25 undergraduate students so far, in an undergraduate course supported by the general education program and the education department, we call, *Is Math Literacy a Civil Right?* The course meets once per week for 4 hours to provide enough time for student training and class work, as well as time to travel to work in an afterschool program once per week for 7–10 weeks with elementary and middle school students.

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The NEC student participants learned about Flagway, how to play many different math games, how to work with middle and elementary students as learning partners, and how to run our Flagway tournaments with the support of Maisha Moses and several of YPP's youth Math Literacy Workers (MLWs).

This project has received funding and support from NEC and from an outside nonprofit that received a large federal grant to provide services to low-performing students across New Hampshire. Working closely together, we have all built a version of YPP's Flagway program at NEC.

Bill and his students have worked with several community partners as we developed and implemented the program. The NEC YPP Flagway has had excellent support from our K-12 school partners, and we have worked closely with the assistant superintendent of schools for curriculum and instruction, principals from the first elementary school where we initiated our first Flagway pilot program, and the principals from the four middle schools have all supported and participated in helping us offer the program.

We invited a respected youth voice advocate and leader to work with us in the middle school, because of his experience as a longtime community leader in the city, and because of his close ties and connections with communities of color in the city. This partner is a local basketball legend in the city, and he serves as the high school basketball coach at the largest and most diverse high school in the city. He brought along five of his high school students of color who participate in his youth leadership organization to work alongside the mostly white NEC students and to co-teach the Flagway game to our middle school students. We felt strongly that this opportunity to engage these local high school students as our partners allowed us to approach our work with diverse groups of middle school students in ways that were consistent with YPP values and culturally responsive mentoring practices.

We have tried to capture the process we have used to implement Flagway over three semesters, between Spring 2019 and Spring 2020. This study addressed the research question,

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“In what ways does participation in Flagway affect elementary, middle school, and college students?” To address this question, this article reports on:

- observations of NEC students being trained to become MLWs by our YPP trainers;
- student reflections during class discussions and on written assignments about the history of the Civil Rights Movement and the connections between our work at NEC and the Algebra Project, YPP, the We the People – Math Literacy For All Alliance, and the Flagway Program;
- student discussions and reflections on class readings related to cultural competency and antiracism;
- students’ writing reflecting their experiences meeting and working with diverse groups of elementary and middle school students;
- the contents of hundreds of pictures of students playing team building and math games, working together in groups to run the Flagway structure, and competing in our first New Hampshire Flagway tournaments; and
- small group discussions held at the end of the program with middle school students to understand what happened to them as math learners because of their work with their NEC Flagway coaches.

Developing the Flagway program has been a process of trial and error, start and stop, one step forward, one step backward. We believe that telling a number of key stories to illustrate the major milestones and challenges we faced on our journey is the best way to capture the essence of the NEC YPP Flagway program and some of the important effects of this experience on both the elementary and middle school students and on the NEC students who have helped to build and run this program.

### **Participants and Setting**

Three groups of students participated in the Flagway program and in this study. The first group consisted of three groups of college students who took our three 15-week Is Math Literacy a Civil Right? classes (6–8 students per class x 3 semesters). The NEC undergraduate students represented first-year college students through college seniors, who enrolled in the course in Spring 2019, Fall 2019, and Spring 2020. Each semester, the program held multiple training sessions and a weekend training retreat to prepare for our 7- to 10-week afterschool program.

The second group of participants was a group of approximately 45 elementary school students from Grades 4–5 who participated in our Flagway pilot project and a few of their parents who attended the first annual NH Flagway Tournament.

The third group of participants was a group of approximately 90 middle school students from Grades 6–8 who participated in our Flagway middle school program in Fall 2019 and Spring 2020. Note that the 45 students who attended in the third cohort (Spring 2020) attended only the first meeting before schools closed due to COVID-19.

The elementary and middle schools in which we have offered Flagway are in one of the largest, most demographically diverse cities in New Hampshire with 86% of the population White and 14% of its citizens people of color. The city has long served as a refugee resettlement community and has become home to a highly diverse citizenry from all over the world. This diverse community is not the norm in NH, as the 2017 U. S. Census Bureau reports NH is the 4th most White state in the nation (90.3% White).

### **Limitations**

There are limitations to relying on stories alone to provide rigorous evidence of any phenomenon or issue, especially if the goal is to generalize findings. The PAR study presented here should not be construed as being a rigorous study on the effects of the Flagway program

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on students' math learning or literacy. That is the next Flagway study planned once the program resumes.

The original goal of this PAR study was to employ both quantitative and qualitative data collection methods to develop a complete picture of the effects of the Flagway program for all student participants. In future research, NEC students will collect more in-depth quantitative and qualitative data through pre- and post-tests using a nationally normed math literacy test used by the YPP to study the learning effects of Flagway. We will also conduct additional focus groups and collect interview data when the program resumes. We had already collected baseline mathematics test data in the early spring from our middle school students but were unable to complete the post-test or the program itself due to the pandemic.

Data reported in this study are based on the initial findings gathered before schools shut down the program in March. This in no way suggests the narrative data in this PAR study is not informative and useful in understanding the Flagway program and its impact on elementary, middle school, and NEC students. The stories that follow provide a rich description of the Flagway program as experienced and discussed by participants.

### **Results**

I have learned that it was a mistake to just accept myself being mediocre at math when I was young. It wasn't until the end of the Flagway training that I realized that I really could learn, understand and apply these mathematical ideas to compete in the game.

FLAGWAY has taught me that there are fun ways for me to learn math that really work.

(Samantha, NEC Flagway Coach and Math Literacy Worker)

### **What Is Flagway?**

According to The Young People's Project (n.d.), "The goal of The Flagway Game is to create environments where students can practice and celebrate learning math. There are many ways to create a cultural context in which mathematics emerges naturally from students' experience (para.1). The Flagway Game was developed by Bob Moses in 1992 to allow

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students who have historically been denied effective mathematics learning opportunities to gain access to mathematic skills and knowledge.

Flagway can be played with students as early as 1<sup>st</sup> grade. Typically, the game is played with 3<sup>rd</sup>-6<sup>th</sup> graders, however, Flagway has been enjoyed by elementary, middle school, high school, college-aged students and adults. During game play students navigate a Flagway structure that is set up in a large open space such as a gymnasium, library, or cafeteria. There needs to be plenty of room for running!

The Flagway structure is a course of radial "paths" that students run based on the Flagway rules (derived from the "Möbius" Function). Speed counts, as well as accuracy, so as students develop into skilled players, several may be running through the course simultaneously, creating dynamics similar to that of a sporting event. Part of the beauty of Flagway is that students can play the game without knowing the rules at first, learning and increasing their speed and accuracy as they play the game. This allows all students to access the game and learn the underlying mathematical principles as they compete in the game.

Flagway is designed to support the mathematical thinking, learning, confidence, and engagement of students who score in the bottom quartile of national tests of mathematics. The game provides opportunities for struggling students to build on their understanding of basic number facts by incorporating those facts into a game where students guess, conjecture, reflect on the options in the game, and also tie these mental operations into the kinesthetics of running the patterned network of the game. YPP has created board games and physical games that capitalize on young students' propensity for running, the galvanizing energy of team competition, and the intrinsic sense of achievement when the team has figured out the correct category for a given number.

For the past 2 years, we have worked with YPP and our colleagues and students at NEC and have tried to do what Bob Moses taught us to do: to organize and to act, working in partnership with young people as agents of change, learning, leadership, and inspiration, and to

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learn from and leverage their ideas, energy, and voices to help members of our community. We created a course at NEC for undergraduate students that would provide them with a space and an opportunity to immerse themselves in the history and traditions of the Civil Rights Movement and help them gain cultural competence as they explored issues of educational equity, cultural proficiency, critical thinking, and social justice through experiential and service learning.

### **What We Learned From the YPP Flagway Pilot Program**

In Spring 2019, we worked with Maisha Moses and her MLWs from YPP to train 8 NEC students to take on their roles as Flagway coaches in a pilot program. We worked with elementary students who were invited to attend an afterschool math club one day per week for 10 weeks. These students were selected by their principal and teachers because they fell into the bottom quartile in mathematics on state tests. The pilot program involved eight NEC students and about 45 fourth and fifth graders.

### ***Relationships***

We all learned a great deal through this pilot project about how to play the Flagway game and engage students in a series of math games that taught them the skills they needed to learn to play Flagway. One of the most important things the NEC students learned was how important it was to develop relationships with their younger students.

We often discussed how to apply the concepts our YPP trainers taught us each week when we traveled 40 minutes in our NEC van to work with the elementary and middle school students. Some of the important ideas students shared about the ways that they thought about how to reach their students included:

- “It’s all about building the relationships first, then the math will come.”
- “Take time to get to know your kids.”
- “Don’t try to be their teacher, just help them learn how to play the games and have fun.”

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- “It is fine if some kids learn it quickly and others take more time. . . . Let the students help and teach each other, it is fine if they teach each other how to make their flags, there is really no such thing as cheating!”

There is a very important point about the importance of building relationships that must be made here. It relates to our fidelity of implementation of the YPP and Flagway model in our pilot program. The college and program staff are working to meet the challenges of recruiting students of color into our Flagway program. In some ways, it is the elephant in the room. Most of the NEC students that joined our pilot Flagway class were not students of color. Part of this may have been related to the fact that the program was located within the Education Department. Faculty in the Education Department have seen a pattern among our students of late, and particularly among NEC students of color. Our students have increasingly been avoiding the Education major due to fear of, avoidance, or inability to pass the dreaded Praxis Exam. This Praxis requirement for teacher certification poses a classic systemic hurdle for many of our NEC students, but it is having a disproportionately negative effect on many of our students of color. One of the main reasons we wanted to adopt and implement Flagway, when we learned about it, was to give the education department a more effective way to help our students become more proficient in math.

It may also very well be that Bill, the instructor, is White, with limited connections to our diverse student population, and most students who signed up had personal connections to faculty in the education department. We began to rectify this situation when we were able to hire our first Flagway Co-Director, Shania, who is a student of color, and her leadership and presence made the program more consistent with the YPP model. Our efforts to gain traction in this math literacy leadership program with students of color at the college remains a challenge.

The YPP Flagway program has been specifically designed based on a near-peer mentoring model that focuses on bringing positive, personal, and engaging math learning opportunities to specific groups of “priority students”; Black students, Latino students, ELL

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students, and students experiencing poverty. One of the primary relational and pedagogical assets that the Flagway model brings to the table are the racial, cultural identities of the near-peer MLW mentors who share racial affinity with the younger students with whom they are working. Despite NEC's Flagway program's struggle to attract as many students of color as we will need, in order to provide this relational pedagogical connection for the numerous diverse students with whom we have worked so far, we have seen these relational connections occur in other ways.

Two factors were often discussed about building relationships and making connections with the younger students. The first relational connection point we saw was the fact that so many of our NEC students have had, and continue to have, their own personal struggles as math learners. When we asked our class why more NEC students were not signing up for this great class, our students said, "students will never sign up for this class because the word MATH is in the title!" So, math avoidance was a problem from the very beginning. On the other hand, our NEC students' personal struggles with math actually became a great source of empathy and connectedness with their elementary students. The NEC students authentically shared their own math struggles and showed they were learning new math ideas and skills along with their elementary students through Flagway, even if they are in college. They were able to make the point that anyone can learn math when it is fun.

The second relational connection we have seen is the personal experience that several of our most successful MLWs have had with the traumatic effects of poverty in their lives. Numerous younger students in program, who all too obviously suffer from poverty, developed very positive relationships with these MLWs. NEC student mentors have shown deep levels of empathy and have effectively reached out and made powerful personal connections with their elementary and middle school students.

NEC has faced difficult challenges when it comes to recruiting racially diverse students to become MLW's in the Flagway program. Despite this limitation, our NEC students have done

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a remarkable job building positive, powerful, and personal relationships with their Flagway teams by leveraging their empathy, sharing other commonalities, and whole heartedly embracing the mission and purpose of the program. The NEC staffs needs and yearns to do a better job recruiting from NEC's diverse student body as we move forward.

### ***The Importance of Snack Time***

Week by week, the relationships between the elementary students and NEC coaches grew stronger, and one of the best ways we found to connect with the elementary students was during snack time. NEC students always brought healthy snacks for the children. The NEC students sat with their elementary student teams during snack time, during which they talked, watched, listened, and learned a great deal about the children. The NEC students were shocked at how much the food meant to the young students. Some students always asked for more, some packed their snacks away to take home and the NEC students took pleasure in planning, purchasing, and sharing snacks with their teams every week. Bill's students also got to see firsthand that food was not always available to the students on their teams.

### ***The Power of "Cool"***

Our students quickly learned one of the secrets to helping young people "buy in" to something (like math) is to make it cool. Learning math through games was a cool way to approach this work with struggling students. The younger students could not wait each week for the NEC students to arrive at their school. These younger students admired and looked up to their NEC Flagway coaches. The students seemed honored that the NEC students took an interest in them and wanted to spend time with them.

Having young people serve as near-peer math literacy mentors and coaches to younger students is one of the most important aspects of the Flagway program. If adults took the same games and activities and tried to "directly teach" them to these elementary students, the experience would not be at all the same. The near-peer mentors bring the cool factor to this work, and they ask their younger students to explain things to their teammates and help others

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on their team figure things out. The near-peer mentors listen to their students and try to respond to their ideas. They point out the strengths and abilities they see in each child and praise students for contributing to the team and working to win the games together. Younger students respond proudly to such acknowledgement and recognition from their cool college coaches, and they work even harder to make them proud.

Another way to make this work “cool” was to create Flagway T-shirts. Bill’s NEC students designed and purchased Flagway T-shirts for their students, which were a huge hit. Developing the design for the Flagway T-shirts each semester became a great project for the NEC students. One semester, our NEC students held a campus-wide T-shirt design contest to publicize our Flagway class. The T-shirt design contest helped spread the word about Flagway across the campus and helped us recruit new NEC students.

Eventually, the Flagway T-shirt design contest was won by one of the students in our class named May. May was quite shy, hesitant, and quiet at times, but when she won the contest and her “very cool” Flagway T-shirts were printed and worn by everybody in our class and all the students in the Flagway program, May began to come alive and find her voice. As her T-shirts gave our students some swagger, identity, and purpose, May’s body language and commitment to the program changed; her self-confidence seemed to grow exponentially when she saw how her love of art and talent as an artist helped her make a significant contribution to the program.

There is a great book about student activism and youth voice by Tina Roseberg (2011), called *Join the Club: How Peer Pressure Can Change the World*, which shows the power of “cool” when it comes to reaching young people. The book describes the incredible success of many civic action and political movements led by young people throughout the world over the last several decades. Here are three examples or models from the book we have used as models to bring in the “cool factor” to our Flagway work at NEC:

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1. A college-age group of student activists from Serbia created a program called RESIST. This group led college-age young people throughout Serbia to stand up to “the man”: Serbian dictator Slobodan Milosevic, one of the most brutal and long-standing dictators in the world. Young people from RESIST used audacious, funny, and fun resistance tactics, some reminiscent of James Bond, the likes of which had never been tried in Serbia before. These strategies for making resistance cool—as opposed to scary—made headlines and earned RESIST lots of national attention. RESIST sparked a popular peaceful uprising that overthrew the vicious dictator. The RESIST youth leadership model was used a few years later to inspire young people throughout the Middle East and sparked the Arab Spring.
2. A highly successful teen-inspired and youth-led HIV-AIDS prevention program, LoveLife, sprung up in South Africa when HIV-AIDS was ravaging the continent. The LoveLife youth did not focus on preaching to their peers about safe sex practices. Instead, they organized events and activities and created fun, positive experiences and messaging for youth. They organized amazing free concerts featuring popular musicians; they developed slick radio ads that encouraged young people to aspire to “live life fully and have fun”; and they handed out millions of Love Life T-shirts young people proudly wore to show they were part of the LoveLife Movement. The program worked far better than anything adults had tried before to flatten the HIV pandemic curve and to help young South Africans understand how to avoid HIV-AIDS.
3. Rosenberg (2011) also shared the story of successful antitobacco advertising campaigns led by young people from several southern states in the United States. They produced simple, cool, rebellious antismoking, anticorporate TV ads to rebel against big tobacco’s \$35 million cigarette ad campaign developed to target young people to buy cigarettes. These young activists made it cool to quit smoking. Their public health campaign was designed to show teens that being a smoker meant

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teens had been manipulated by adults. These ads revealed to young people that by smoking, teens were doing exactly what the adult goons from big tobacco wanted them to do. This successful youth campaign helped launch a nationwide movement by young people to choose to move away from buying and smoking cigarettes.

There is power in a cool T-shirt, or a cool message of “resistance or rebellion,” to rally young people to a cause. There is also power to joining and belonging to a “club of your peers” whom you see as being cool. When NEC students brought math games and Flagway to these elementary and middle school students, they brought the “cool factor” to math in ways that broke down resistance to math learning. The RESIST activists believed cool T-shirts can actually change the world. The Flagway program adopted these strategies about the power of cool near-peer math mentors to teach younger students rigorous mathematical concepts. Our NEC students saw that helping to fight against systemic racism and educational inequity was a cool thing to do and has made learning about history and CRT engaging for them. It may seem trivial, but cool really works!

### **Flagway Moves to the City's Middle Schools**

By the beginning of the summer of 2019, we had written and received a sizable grant from a New Hampshire nonprofit organization that had received a major federal grant to support middle school students deemed at risk of dropping out of high school or not aspiring to postsecondary education. This grant would provide full funding for the program for a 2-year period and cover the costs of transportation, 2 years of Flagway training from YPP, instructional materials, the purchase of Flagway game structures, healthy snacks for our students, T-shirts, and stipends for our veteran NEC students who have become certified Flagway MLWs after completing the first class and working at the elementary school. The MLWs play an increasingly important role in developing and implementing the program.

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The college is providing matching funds, thereby fulfilling its commitment to the program. This financial support and recognition of the value of the program by our funding partners has provided additional credibility and a source of pride for all of us.

The Fall 2019 session of the program with middle school students went incredibly well. Our class met each Monday for 2 hours to prepare our games and activities and to prepare the NEC students to assume their roles. We gathered up snacks and drinks, white boards, whole number and prime factorization cards, markers, and paper and pencils and loaded up the NEC van to travel to the middle school to work with our middle school students.

Each Monday afternoon, the buses would arrive at the middle school, and the NEC students would greet the middle school students and reconnect. They always took time to informally mix and mingle before getting into their teams to play the week's team building games. The team building games spilled seamlessly into simple math games. Each week, we worked our way down our list of math games that our NEC students learned from our YPP mentors or created themselves. Each week's games built on one another and allowed our middle school students to become familiar with and practice the math skills and concepts that make up the arc of Flagway.

### ***The Arc of Flagway***

The arc of Flagway is a set of mathematic concepts and skills necessary for students to understand so they can crack the code of the Möbius function, which is at the heart of the Flagway game. Here is the sequence of mathematical skills and concepts that both NEC and middle school students learned from our YPP trainers and that our weekly math games and activities were designed to help students play with, practice, understand, and apply so they could play the Flagway Game. We all learned:

- about the properties of **odd and even numbers**;
- to understand **prime and composite numbers**;
- to break down any whole number into its **prime factorization**;

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- to create factor trees and compete in factor tree races to build speed and accuracy in prime factorization;
- how to convert prime factors into one of three **mutually exclusive groups**, each representing a different **algebra form**;
- **how to convert those algebra forms into one of three colors** (red, yellow, blue);
- how to put all this information together to **make their Flagway FLAGS**, so they could play the Flagway game;
- how to practice **running the Flagway structure** along the proper colored pathways, at the end of which they learned how to place their FLAGS to gain points; and
- how to build their individual and team **speed and accuracy**, so they could compete successfully against the other teams and try to WIN the Flagway game.

Our students saw growing evidence each week that the elementary and middle school students were not only learning how to play the math games but also learning how to play together and work cooperatively to compete in the game as a team. Each week, we saw dramatic improvements in student focus, collaboration, and positive behavior as students gained social and emotional skills by working together to play the math games and build their speed and accuracy. We saw students rely on one another and acknowledge and appreciate one another's unique talents and skills as teammates for different parts of the games.

### **Applying Our Learning to Compete in the First Annual New Hampshire Flagway Tournament**

Our first New Hampshire Flagway tournament took place in Spring 2019 as part of our first pilot project at the elementary school. About 45 elementary students participated, and they had a blast. The school principal who had helped us recruit students and organize the weekly after-school meetings came and watched his students compete in the Flagway tournament. He brought a few of the teachers to observe their students competing in the Flagway Tournament.

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We were proud to show the principal and teachers what their supposedly poor math students could do. After the tournament, the principal asked, “How can we get this program into the hands of our teachers?” We told him that YPP is working to develop a plan for this.

That first Flagway tournament demonstrated to the principal and teachers that these highly diverse students had far more potential as math learners than may have been recognized. It is quite impressive to see fourth and fifth graders applying pre-algebra skills to try to win the Flagway game and loving it!

When students who score in the bottom quartile on math tests demonstrate they are fully capable of learning basic math and pre-algebra—when taught using more appropriate, culturally responsive pedagogies—teachers and school leaders are faced with the realization they may be underestimating the talents, abilities, intelligence, and potential of whole groups of students. The Flagway tournament was a celebration and a testimony to the abilities of these so-called, struggling students and hopefully a wake-up call to educators and parents about the untapped potential of these and every student. Check out this video from The Young People’s Project (2019) showing what the National Flagway Tournament looks like in action:

<https://www.youtube.com/watch?v=IFVIU0tuFqk>

### **Middle School Flagway Program**

We moved the NEC Flagway Program to three of the four city middle schools in the fall of 2019 using resources we received through our grant. One powerful way to understand the impact of this middle school program is to fast forward 14 weeks from when we first started the YPP training of the NEC students from this second class to prepare them to go into the middle schools and work with a group of 45 middle school students. Next is a description of what happened at the second NH Flagway Tournament held in fall of 2019.

There were no parents, teachers, or administrators in attendance at this second New Hampshire Flagway tournament, which was disappointing to us, so adults did not see the amazing work their students had done to learn lots of new math skills and concepts. A

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wonderful part of this second tournament, however, was when I noticed all of the NEC student coaches were sitting on a bench together in the cafeteria, away from their teams, watching proudly as their middle school teams worked feverously playing and competing in the Flagway game.

### **Step-by-Step Guide to Playing the Flagway Game**

Here is my attempt to explain what those NEC coaches were beaming about as they watched their teams competing in the second annual New Hampshire Flagway tournament:

1. Several teams of students are clustered around their HOME tables at the end of the middle school cafeteria. The Flagway structure is set up on the floor in front of the teams. At the other end of the cafeteria, each team has a NUMBER table that contains whole number cards ranging from 2 to 100.
2. Once a tournament judge says, "Ready, Set, GO!," one student player from each team runs as fast as possible from their HOME table across the space to their NUMBER table at the far end of the room, where they quickly choose three random number cards from the scattered pile of cards lying face down on the table.
3. The player then turns and runs as fast as they can the length of the cafeteria, back to their team's HOME table, where they throw the three whole number cards on to the table face up. Each of their teammates looks at and analyzes the three cards.
4. The player who ran grabs a blank 3 x 4 column FLAG and writes down the three whole numbers on the number cards in the first column of their FLAG from top to bottom.
5. The whole team quickly completes prime factorizations for each of the three whole numbers, and the team members check each other's work to make sure the factorizations are accurate. The player, or anyone on the team, writes these factorizations down in the second column of the 3 x 4 column of their FLAG.

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6. Then, the player who ran, with help from the team, quickly converts the prime factorizations of all three cards into one of three algebra forms and writes the algebra forms for each of the three numbers down in the third column of the FLAG.
7. Once the correct algebra form has been selected, the students on the team work together to “crack the code,” which means they translate each of the three algebra forms into a color (red, yellow, or blue) and they fill out the last column on their flag, writing the names of the colors associated with each of the three whole numbers, in the proper order, to create the final FLAG for this turn.
8. The player then runs clockwise around the multicolored paths of the Flagway structure set up in the middle of the room and enters the entrance to the Flagway structure. The player shows the completed flag to the NEC judge who quickly checks it, once the judge says, “GO,” the student Runs the Flagway STRUCTURE.
9. To Run the STRUCTURE, the player runs to the center DOT of the STRUCTURE, then follows the three correct colored paths that match with the order of the colors on their FLAG.
10. Once a player has Run the STRUCTURE, they place their FLAG on the spot at the end of pathway and exit the STRUCTURE.
11. The player then runs clockwise back to their HOME table.
12. When that player touches the hand of the next player in line, it is now that player’s turn to run to the number table, grab three new whole number cards, and run as fast as they can back to their team’s HOME table to create their next FLAG, crack the code, and repeat the process.
13. The teams play 6- or 7-minute ROUNDS of the game, where student teams make as many runs and as many FLAGS as possible.
14. At the end of each round, the judges review the FLAGS left on the structure by each team. The judges make sure the FLAGS were filled out accurately and placed

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properly on the structure. Teams get 1 point for each FLAG and 1 point extra if the FLAG has been filled out accurately, so a team can earn 2 points for each FLAG.

15. The teams play 2 to 3 ROUNDS, take a snack break, and then play the second 2 to 3 ROUNDS for a tournament. The team with the most points at the end wins, and those players are then eligible to go to the next level and may ultimately end up traveling to the annual National Flagway Tournament to compete for the National Flagway Championship.

When one considers all the skills and collaborative group work needed to compete in a Flagway Tournament, it is easy to understand why watching a highly diverse middle school team of supposedly poor math students running the structure and playing this complex math game on their own would give their NEC coaches such pride! Playing Flagway offers powerful assessments of student learning in mathematics and offers students a chance to become fully engaged as they use their bodies, their minds, and their teammates' help to solve these amazing mathematical puzzles.

### **Effects of Participation in Flagway**

The annual National Flagway Tournament, sponsored by YPP, is held in May each year as part of the National Math Festival. Five of our NEC students were invited by YPP to travel to Washington, DC, in spring of 2019, after we wrapped up our first Flagway pilot project. They were invited to help coach student teams from across the United States that would be attending and competing in the National Flagway Tournament.

The NEC students worked alongside young MLWs from across the country to lead math games and help run the national tournament. One of our students, Shania, one of two women of color in the class, was invited to be part of a small group of MLWs in Washington, DC to accompany Bob Moses and other Alliance members as he testified before the U.S. House of Representatives Education Committee, endorsing a new bill that would ensure support for quality education for every child in the United States as a civil right.

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Shania was so inspired by this opportunity that she changed her future plans when she got back to NEC for her senior year. Shania was a biology major and planned to start her journey toward medical school and becoming a pediatrician after graduating from NEC. However, she was so personally moved by her role as a Flagway coach and MLW that she was now determined to become an elementary math and science teacher so she could continue her work with Flagway and YPP and serve the needs of children who struggle with STEM learning in her home city of New York. We hired Shania in fall of 2019 to become the first co-director of the NEC Flagway program, and she helped run the program, develop our trainings, build the budget, and train the next two Flagway cohorts during her senior year.

One of the most important contributions that Shania made to the NEC YPP Flagway program was to help build an organizational bridge to NEC's new Office of Diversity and Inclusion. Ever since Shania took on the role of Co-Director of Flagway, we have begun to co-plan and work more closely with the Director of that office, to build connections between NEC's YPP Flagway Program and the many students of color who are strongly tied to the Office of Diversity and Inclusion. Our hope is to build upon and sustain this organizational connection moving forward and to continue to strengthen our links and bonds to NEC's students of color through our growing relationship with the Office of Diversity and Inclusion. This is an essential part of creating a more fully authentic Flagway program at NEC.

### **Reflections From NEC Flagway Coaches**

After participating in the 10-week afterschool programs and the Flagway pilot program, our NEC students wrote reflections to describe some of the important things they learned:

- “My understanding of math literacy as a civil right has changed, over the course of this semester. I did not view math literacy to be in the same conversation as civil rights, prior to entering the course. Now, I view math literacy as having great importance for everyone, especially those students in the bottom quartile. If students can excel in math, they may be able to excel in most other subjects.”

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- “I will seek to inspire these students that have been marginalized in the education system; to view their potential to be far more powerful than the circumstances in their lives which they cannot control.”
- “The NEC coaches and I should [find] different ways of inspiring these children to succeed and to have hope in their ability to overcome circumstances that seem futile in their lives, especially as it pertains to math.”
- “FLAGWAY should be implemented in inner city schools because when you come from an impoverished place, and on top of that, you are a minority student, your chances of going to college are slim. It is a struggle to graduate from high school, coming from poverty, which then makes it impossible to ever start post-secondary education. This program has sparked a new passion in me about what this program could really do for our students.”

### **Parents' Roles**

Bob Moses says one of the most important parts of Flagway is to show students, as well as their teachers and parents, that each of them is fully capable of learning math. Moses makes this critical connection between high expectations for all children as math learners and quality of life in the 21st century and for generations of families.

Parents and families can also feed into the self-fulfilling prophecy of math failure. Teachers often hear parents say, “Oh, I don’t do math,” or, “We aren’t math people.” Imagine the power of these messages and the damaging effects they might have on a child’s confidence or motivation to “do math.”

The NEC Flagway Program followed Bob Moses’s advice and invited parents of the elementary students to come and watch their children compete in the first New Hampshire Flagway tournament. We ended up with six parents who came to watch their children play Flagway. At the half-time break in the tournament, Bill asked the parents to come out into the hallway while their students were having their snacks. He asked the parents what they thought

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about their children doing math in this way. The parents were very vocal about their reactions to their children's engagement in the program and to Flagway:

- "I can't believe that he tells me every Monday that he wants to stay after school to do Math Club!
- "He has never been able to work with or play like this with other kids", I can't believe it!," one mother said with great shock and surprise.
- "No one in our family is good at math, so we are surprised when she comes home every week saying how much she is loving playing the math games and explains these math ideas to the whole family."

Bill told these parents that now that they had seen that their children are fully capable of learning math and can be successful and gain confidence as math learners, it will be up to them as parents to advocate for their children as math learners in the future and not buy into the low expectations they may have had for their children as math learners. He also told the parents they will also need to be prepared to push their child's teachers or their schools to offer different math learning opportunities for their children, opportunities that do not turn them off to math or convince their children they are incapable of learning math. These parents were surprised that what seemed like a game was so much more.

### **Flagway Made a Difference**

After the middle school tournament, several of the middle school students began asking the same question: "What do we do next?" We told them, after our tournament, there would be the end-of-December school vacation, and another group of NEC students would take the Is Math Literacy a Civil Right? course in the spring. Those new NEC students would then be coming back to the middle schools to work with a new set of 40-50 middle school students. These students did not like this answer! They wanted to come back. They wanted to keep going with Flagway. We felt badly that we had developed these relationships with them, and after the 10-week program was over, that would be it.

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### **Spring 2020**

Our third group of eight NEC students signed up for the Is Math Literacy a Civil Right? class for the Spring 2020 semester. They received their Flagway training from YPP, and we continued to have a few experienced former NEC MLWs work with this group to prepare them to go into the middle school.

There was a delay in starting the 10-week after school program in the spring due to standardized testing conflicts, so our start date kept getting pushed back later into January. February came, and we still had not started with Flagway. Delays in starting the middle school program continued, so while we waited for the schedule to be sorted out so we could begin the program, we contacted a colleague who is the math specialist in a rural elementary school in our area. She invited our class to come work with her fourth- and fifth-grade students so we could practice our math and team building game facilitation and group management skills. Those sessions went great. Our NEC students gained valuable experience and greater confidence, but we were all eager to get going with the new class of diverse middle school students in the city.

Finally, the day came in late February when we could begin the next Flagway after-school program with the middle school students. Our students were not only super well prepared but also had been doing a good deal of additional reading and discussion on issues of racial injustice in the United States; the Civil Rights Movement; and the ongoing learning, funding, and opportunity gaps and disparities in U.S. schools. More than any NEC students yet, this third cohort of NEC students understood the equity issues that were the heart and soul of the Flagway program. By the time they met with the new cohort of 45 middle school students, they were pumped up and deeply committed to this work!

We arrived at the middle school early to set up the library into areas where we could meet in small groups with the students. The new group of middle school students arrived excited, and, at the beginning, things were chaotic.

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One incredible fact was clear immediately, at least 12 of the students had returned from the previous semester. These veteran middle school students hugged the two NEC MLWs who had worked with them the previous semester. Within a few minutes, the MLWs brought these veteran middle school students over to tell Bill they had something to show him.

Many of the returning students took out what we quickly realized were their report cards. One student exclaimed, "I went from Fs to As in math, Bill!" Another girl shouted, "Ds to Bs for me!" Pretty soon, the entire room gathered around, and we heard these 12 returning students telling our new NEC coaches about how playing Flagway and the afterschool math games they had done before their December break had helped them understand and succeed in math like they had never done before! It was a huge celebration.

One of the Campus Compact Gear Up coordinators and Bill decided to pull those 12 returning students aside in three small groups to talk more fully with them while the new students got going with their team building and initial math games. We asked these students two simple questions: "What worked well for you last time?" and "Why did you come back?" One student jumped right in and said, "I definitely noticed an increase in my grades in math. I was failing before." Another student said, "I came back because now I do math faster." One boy said, "Since a lot of the activities that we do involve running, I came back because I really like running and jumping in general, and I feel like that could be helpful to me." Another said, "The factor trees really helped . . . doing those helped . . . to break down things and do it as a race, and stuff like that."

We also asked these students to tell us what advice they would give their teachers to help more kids learn math better as they had done. One student said, "Teachers should try to incorporate more games in the teaching of mathematics." Another student said, "My teacher just jumps right into the lesson, and sometimes it seems like the students interrupt her because they may not really be ready to learn." One other remarkable student said, "Incorporating movement is another thing that seems to be a good idea. I learn kinesthetically, and so I need to move if I

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want to learn things. I think our teachers need to learn about kinesthetic learners!" Finally, one student said, quietly but determinedly, "I wish we could tell teachers, 'Don't be so mean.'"

On the van ride back to NEC, students in this third Flagway cohort were ecstatic about how their first day went with their students. They had finally met the new middle school students. Their games and activities had gone great because they were so well prepared after the long wait. They spent a lot of time talking about how incredible they thought it was that those 12 students had insisted on coming back and how they had brought their report cards to show us how much they had learned by participating in Flagway, and they were really impressed that these 12 middle school students wanted to become MLWs and help the new group of middle school students learn to play Flagway. This new class of NEC students was determined to tap into the energy and talent of those veteran students and produce impressive results just as the previous class had done.

Bill told our NEC students that several of the site coordinators, who worked with these students at the four middle schools as part of a grant program, mentioned they had seen some standardized testing data in January for the Flagway students who had participated in the fall semester. They said the test scores showed dramatic growth in the students' academic achievement scores in math. The coordinators said they would gladly share these test results with us when we came back the next Monday.

Sadly, we received the word that all the schools in the city would be shut down immediately due to the COVID-19 pandemic at the end of that first week. We would not be returning to the middle school. We would not be seeing these middle school students whom we had met this one time. We would not be seeing those 12 students who had returned on their own to stay engaged with Flagway and help their fellow students as MLWs alongside their former NEC coaches. Our students were devastated at first, but they soon recovered and kept working.

### **Conclusions**

We had the rest of the Spring 2020 semester to try to make something positive out of the shocking situation we found ourselves in as a class when the schools shut down. There is another story about the work this third cohort of NEC students did in the weeks that followed the announcement of schools closing due to the pandemic. The NEC students put all of their Flagway games and activities online by making a set of fun videos demonstrating how to play all the Flagway games we planned to do with the students. They wrote up clear descriptions of each game—using principles of Universal Design for Learning—to help ensure the English language learner (ELL) students would understand the explanations. They tried to provide an online tool kit to allow the students, their parents, or older siblings to help the students play many of the games at home, so they might reap at least some of the benefits they had seen in evidence when those 12 students came back with their report cards on the first day. They created a YouTube channel and a Google site to hold all of these materials and make them available to the students.

That story ended with our collective sadness and anger when we learned most of the 45 students with whom we had worked on that first Monday afternoon in March had no internet access, despite the tremendous efforts city schools made to quickly build the capacity to reach 95% of their students. The vast majority of the Flagway participants were among the 5% who fell into the abyss of the digital divide.

Our NEC students experienced the power of their voices in the development and offering of our weekly Flagway sessions to middle and elementary school students. The Flagway participants got to see the impact they could have on students' attitudes and confidence as math learners. When the pandemic hit, NEC students recognized, in a very personal way, the educational inequity that their students experienced, when we learned their Flagway students would not be able to access their online videos and games NEC students had worked so hard to create and make available. Our students saw firsthand the ways in which institutional racism

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and social injustice work in the real world and how students of color and families suffer disproportionately in times of crisis. As future educators and citizens, we know they will not forget their anger and deep disappointment, or their new understanding of the ways things often go for children in the bottom quartile. The NEC students can now more fully understand Bob Moses's primary message and the rationale behind his activism for quality education for all students as a civil right and his reasons for creating Flagway and YPP. Through their work with Maisha Moses and her staff at YPP, our NEC students began to understand and own their roles as allies, partners, and near-peer mentors, who have experienced what it means to organize, plan, and advocate for social justice, while listening to the needs and voices of their students.

We have geared up to offer Flagway online in those middle schools again as soon as we can. The good news is we may be able to invite more students to join us if we can learn how to effectively implement the program using online tools, and if the students we need to reach and work with have access to online learning by then.

Our goal is to follow YPP's vision of helping to develop and join a National Flagway League. We may also be able to invite other rural students from across New Hampshire, who could easily join us online, if they have access. If our program works, everyone will not only learn more about math, but perhaps we will also be able to bring New Hampshire students from rural and urban schools together to play Flagway as members of a league. Maybe these students will make some new friends and learn more about each other. White students from rural areas playing Flagway with diverse students of color living in urban areas might begin to build bridges across these different communities within our state.

By working together through Flagway, the NEC students hope these young people can show adult leaders and teachers the power of youth voice and how capable they are of learning math when the right approaches are available and used. Perhaps the co-creation of teaching and learning experiences and opportunities for young people to assume active roles as peer-mentors and partners in learning, rather than always being the recipients of adult designed and

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led curriculum and instruction, will become more widely available, and in that way, the YPP way, perhaps more kids can learn to engage in and enjoy math, especially those who have always been left behind.

Maisha Moses's (personal correspondence, Feb.1, 2021) words best summarize the journey we have all been on with Flagway:

If I were framing it, I would say that Bob Moses invented the Flagway game, then turned it over to YPP which provided a space for young people (MLWs and staff) to develop both the curriculum and the program which YPP did over many years. This work happened in the context of the Algebra Project network and now is happening in the context of the We the People - Math Literacy For All Alliance, both of which created space and opportunity for young people in YPP to grow and develop both the Flagway program and as an organization.

Flagway works as it does because it was developed and enculturated by the kids for whom it was intended, and who had to learn through trial and error over many years how to make it work, first as a game, then as a curriculum module (including the Arc of Flagway), then as a training process, and now as a league. Hundreds of young people and YPP staff have contributed to all aspects of that work and all that has been produced. YPP worked hard as an organization to make sure this was so, and to find and establish partners and spaces, and develop programs to enact a shared vision around this work. Of course, NEC is a great example of this partnership.

All of this work has enabled Flagway to take root, which meant both creating opportunities for collaboration, but also holding the space and preventing it from being usurped (and that also took work). Our partnership with NEC grows precisely out of that history, and this approach.

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What is clear to each of us at NEC who has been involved in Flagway is we have seen that Flagway works. It works in multiple and important ways. Here are a few final thoughts Bill's students shared at the end of our latest Flagway course:

- “Learning about Bob Moses redefined for me what playing an active role in antiracism means. Reading about the founding of the Algebra project through grassroots efforts was encouraging and refreshing. I am delighted to have provided a small contribution to students through the Flagway program.”
- “I have learned that teaching is so much more than just regurgitating information to a room of students. It is caring and giving guidance to the youthful generations. It is the purpose of a teacher to instill courage, confidence, and curiosity in each student. Children are naturally curious, we need to take that curiosity and cherish it, let it thrive and build the desire to learn in our students.”
- “Being in the class has shown that racism is real, as much as people think it’s been put to an end in 1875, to this day it is real.”
- “By doing the Flagway program, these students are going the extra mile for their education. They are pushing themselves further to do better for themselves. I want to keep encouraging students to have this self-driven motivation.”
- “I learned about myself, that I have a passion for teaching, but not just teaching, I have a passion for connecting with students on a personal level. Having a good connection with students makes teaching more enjoyable for them and for me as well. I love this course, and I’m grateful that I had the opportunity to learn about Flagway. I learned that teaching can be fun. It’s all about having FUN! If you don’t have fun while you teach, then you’re not doing your job correctly.”

## **Final Thoughts and Recommendations**

We hope NEC's Flagway story may help others begin to change the trajectories of their thinking and behavior related to issues of racial justice, educational equity, and powerful, personal effective teaching every child deserves in the United States today. We hope it will provide options, choices, and commonsense solutions for other colleges, K-12 schools, and educators, and for high school and middle school students who want to play critical and unique roles as antiracist leaders in their schools and communities. Finally, we hope the solutions we discussed here can help us all to more honestly and more fully embrace the democratic and humanistic traditions and values we proclaim to cherish and apply them more fully every day to lift up all students so they can fulfill their potential as fellow human beings.

## **Recommendations**

1. ***Open doors of opportunity to students, their voices, their questions, their ideas, and suggestions for improving education and invite them to serve their peers and schools as partners.***

Prepare and provide spaces for students to become civic leaders who think critically and develop clear-eyed, reparative/restorative programs and practices to undo past injustices to black, Latinx, indigenous, immigrant, and other historically marginalized communities.

2. ***Teach the uncomfortable stuff, use it to learn and inspire us all to move forward.***

Provide resources, encouragement, and opportunities for students to learn the hidden histories of our nation and the lessons that can be drawn from such knowledge.

3. ***Take affirmative steps to bring diverse pedagogies, leaders, teachers, and students into predominantly white institutions.***

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We hope that this PAR study demonstrates there are important things that white, privileged leaders, faculty, and students within the nation's predominantly white institutions, like NEC, can do to work as allies and partners and use their authority and power to open doors and welcome more diverse people into our organizations, and to help to bring about antiracist and culturally responsive pedagogies and learning opportunities like Flagway.

4. ***Fight for socially just, humane laws, polices, and legal solutions to eliminate systemic, institutional racism in our states and country.***

Stand up against systemic educational inequality and social injustice and advocate for a new round of civil rights laws and policies to break through and deliver on the promises of the civil rights movement to achieve equity, quality education, housing, food security, health care, clean air and water, and access to digital skills, tools, and resources required for full participation in the 21<sup>st</sup> century economy and educational system.

5. ***Join the community of nations and commit to ensuring the rights of all children.***

The people of the United States, schools, colleges, universities, teachers, parents, and economic and political leaders need to overturn our nation's failure to adopt and ratify the United Nation's Convention on the Rights of the Child (UNCRC) (2002), adopted by every country in the world except the United States. Our nation must adopt the UNCRC to establish new youth-informed and youth-centered norms, policies, laws, and a renewed commitment to guarantee and protect the rights of all children.

These are big steps, and they will not be accomplished easily. Working as true partners with our young people will empower them and enable us to reach these goals. If kids can overthrow dictators, help end the HIV-AIDS pandemic, and deter their fellow young people from

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being manipulated to start smoking, then who knows what else they can do. Flagway shows us all young people are fully capable of creating spaces where learning math is possible, and when we work together with young people as partners and hear their voices, we can all take more effective action and have a lot of fun along the way.

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