Healthy Girls Engineering Change

2013 Fiscal Year Kenan Biddle UNC-Duke Partnership Grant Proposal

Camille McGirt UNC-CH '13

Christine Schindler Duke '15

"Integrating the Promotion of STEM Education and Health and Wellness for Girls in North Carolina"

Table of Contents

Executive Summary

High-quality organized sports programs and consistent physical activity are a gateway to academic achievement, better grades, and improved chances of attending college. Girls, often face higher barriers regarding participation in structured physical activity programs. These barriers include cultural/gender factors and weaker parental support for sports involvement. Physical activity among children not only helps them stay healthy, but studies show that it can also enhance important skills like concentration and problem solving, which can improve their academic performance.

Girls and young women face certain challenges and obstacles that their male counterparts do not. Historically women have been underrepresented in the sciences and struggle with body image issues, self-confidence, and nutritional/fitness personal responsibility. Empowering girls to have healthy body images will result in great self-confidence, and provide them with the abilities to succeed in areas they otherwise might not have seen as possible.

The percentage of female engineers across our country is only 11%, and the percentage of women studying to become engineers in universities is a low 13%. After analyzing these statistics, it is incredibly apparent that the field of engineering is an extremely male dominated field. Because so many of the world's problems can be solved through the STEM fields (Science, Technology, Engineering, and Math), a way to increase transformative equitable change through these fields would be directly related to increasing the amount of young women encouraged to study and actively pursue science, technology, engineering, and math.

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Additionally, today almost one in every three children in our nation is overweight or obese. In North Carolina, the numbers are more alarming than the national average. Childhood obesity is an epidemic in this state. Girls and women are predisposed to burn fewer calories than men because they have fewer muscles and naturally hold more body fat for childbirth. Girls are also not consistently pushed to participate in physical activity on a regular basis. A focus on chronic obesity related prevention for girls is needed for our communities to build healthier families, and healthier people. By focusing on prevention communities may have less adverse health outcomes in the future.

These two issues may seem separate, but in actuality they are integrally related in that the empowerment of young women may give them new opportunities. Sustaining a healthy lifestyle and positive self-image helps to breed confidence and self-efficacy, self-efficacy (a person's belief in one's capabilities to learn or perform behaviors) in turn influences academic motivation, learning, and achievement. By providing an outlet to develop and sustain the tools and knowledge for a healthy active lifestyle while also teaching and exposing girls to the STEM field and technologies girls will become healthier, more interested in STEM academia, and maintain a positive self-image. Our proposal is to merge two

existing programs, Healthy Girls Save the World (www.healthygirlssavetheworld.org) and Girls Engineering Change.

Healthy Girls Save the World is an organization that provides the tools and knowledge for girls to create and sustain a healthy and well-rounded lifestyle. The free program is for girls ages 8-15 and promotes "healthy bodies, healthy minds, and healthy relationships". It is a holistic health organization; however, a great emphasis is placed on physical health and addressing childhood obesity. The program provides information about exercise and nutrition and integrates lessons on self-esteem, good study habits, and the importance of respectful and positive relationships. During events participants meet and engage in physical activity with student athletes in the UNC Athletic Department, hear from nutritionists and guest speakers from the School of Public Health, and they also meet students from UNC in the form of volunteers and/or collaborations with student organizations.

Girls Engineering Change is a mentorship network which partners university students pursuing engineering majors with young girls in middle and high school to assemble low cost medical devices that are sent to hospitals in the developing world. This process provides young females with a mentor studying engineering and a tangible example of how she can make an impact in the world using engineering skills. One medical device that Girls Engineering Change uses is purchased through "Engineering World Health (EWH)". EWH sends electrosurgery unit (ESU) tester kits that are put together by engineering mentors and participants during Girls Engineering Change events and then sent to developing countries. Hospitals in the US and Europe typically update their medical equipment every few years, and discarded models can make it to the developing world. Much of the donated medical equipment is not fully functional, but this is not always obvious to doctors and technicians in developing world hospitals. ESU analyzers perform the task of calibrating these precise medical instruments to ensure patient safety and proper functionality. Building ESUs is a fun and educational activity that is suitable for all skill levels.

By combining these two initiatives into one joint program where girls could participate in sessions encouraging healthy habits as well as imparting knowledge on the importance of STEM education, our collaborated initiative "**Healthy Girls Engineering Change**" will attempt to tackle a few of the many problems facing young females today.

Schedule of Proposed Activities

Healthy Girls Engineering Change will host free events on the campuses of UNC-CH and Duke University. During these events participants will gain the tools and knowledge to sustain a healthy and well-rounded lifestyle while also learning about the STEM field and technologies. The Kenan Biddle grant will allow us to hold three free events over the 2013 fiscal year serving fifty girls to one hundred girls within the Durham/Chapel-Hill region.

An event would consist of the following similar activities:

Date: April 13, 2012
Location: UNC-CH
Time: 9:00am-3:30pm

Time	Event Item	Description
9:00-9:30am	Sign In/Registration	Participants are dropped off by their parent/guardian and are signed in by a volunteer. The participant receives a name tag and sits with their respective age group. ***All participants must have a parental filled out permission form in order to sign in.**
9:30am-10:00am	Icebreaker/Introductions	The session begins with an introduction to "Healthy Girls Engineering Change" and a breakdown of the agenda for the day. An icebreaker may include a "Let's Move" dance (ex. http://www.youtube.com/watch?v=mYP4MgxDV2U) or Q&A within age groups.
10:00am-10:30am	GEC Introductions, "Why is STEM important?" Discussion	During this discussion, girls will be briefed on what engineering means, and why this is an important field for them to know about and possibly pursue for careers. At this point, each mentor will introduce themselves and explain why they are interested in studying engineering. One mentor will explain what the girls will be building (ex. electrosurgery unit testers), where these products will be sent, and why this is an important initiative. Next, a safety session and quiz will be administered.
10:30am-12:15pm	Assembly of devices with engineering student volunteers	In pairs, (one girl per volunteer) the medical devices will be assembled following the instruction manuals, and students will discuss what it is like to be an engineering student and how this fits into the girls' individual interests. When they finish assembling the device, the mentor will attach it to a battery so the girls can see their work light up as it would when checking the calibration of an electrosurgery unit.
12:15-1:00	Lunch Guest Speaker-Beth MacIntosh MPH, RD Nutrition Research and	Lunch Caterer: Mediterranean Deli Gives a talk about nutrient dense foods and how they are important when making healthy food choices. She

	Metabolism Core Project Director UNC School of Medicine	talks about the foods that are presented during lunch and how each of them plays different roles in metabolism and overall nutrient distribution.
1:00-1:15	Walk to Carmichael Gymnasium	Cleans up for lunch, group walks to Carmichael gymnasium to meet the women's basketball team.
1:15-2:15	Basketball Session with UNC Women's Basketball Team	Participants meet the women's basketball team and there are stations set up for different facets of physical activity (shooting, running drills, defense drills, agility etc.). Each group switches after 10:00 minutes. (halfway 10:00 minute break)
2:15-2:30	Q&A with WBB	After physical activity our participants sit down with the women's team and ask them questions about college life, student academic success, and their journey to becoming successful college athletes.
2:30-2:45	Walk back to Student Union	Finishes up with the Women's Basketball team and walks to the Student Union.
2:45-3:30	HGEC Jeopardy & Reflection	Participants are split into groups with equal representation form each age group. The groups pick number that corresponds to easy "100" level and hard "500" level questions. All of the questions pertain to the day's activities. This allows for participants to recall all of the information that they learned. After a team wins the jeopardy game all participants are given reflection activity sheets to think about the day's activities and write how they can implement what they've learned once they get home.
3:15-3:30	Sign Out	Participants are given a bag with school supplies and inspiring letters from our program as well as potential handouts from guest speakers. Volunteers help to sign-out participants and their parents pick them up.

Qualifications Statement of Individuals Submitting Proposal

Camille McGirt
School: University of North Carolina at Chapel Hill '13
Major: Public Health- Health Policy and Management

Camille McGirt is an undergraduate Health Policy and Management major at the University of North Carolina at Chapel Hill. During the fall of 2010, Ms. McGirt participated in The White House Internship: A Public Service Leadership Program within the Office of Presidential Personnel. When Ms. McGirt left Washington she wanted to continue public service efforts and combine it with her love for preventive health education. During the summer of 2011, she established "Healthy Girls Save the World" (HGSW) a program that promotes healthy lifestyles for girls ages 8-15 in North Carolina. HGSW provides free events for girls to learn about nutrition, physical activity, positive relationships, and the program allows for participants to meet and engage in activity with collegiate athletes. Her program has grown into a nationally award winning organization reaching close to 100 girls in this community within just one year. The program has been recognized by the Clinton Global Initiative, Pearson Foundation, Maya Angelou Center for Women's Health and Wellness as well as several other institutions. Please learn more at www.healthygirlssavetheworld.org.

Christine Schindler
School: Duke University Pratt '15
Major: Biomedical Engineering
Certificate: Global Health

Christine is a sophomore at Duke University who is incredibly interested in the applications of engineering in the world. On campus, she is involved on the executive team for Duke Partnership for Service, and Vice President of the Engineering World Health team. She also enjoys being a part of the Greek Life and Selective Living Group communities on campus. In her free time, Christine enjoys coordinating and attending events with the Duke Catholic Center and spending time with her friends and family. She is incredibly excited about the opportunity to engage with Healthy Girls Save the World in order to create a collaboration which could positively impact many girls in the triangle area.

Programmatic Benefits from the Project

Healthy Girls Engineering Change proposes to address the issues of STEM education for girls and proper health and wellness by

- Providing girls with university student mentors
- Hosting easily accessible events at no cost in the community
- Promoting health and wellness by leading engaging conversations about positive body image and self-esteem while also engaging with college athletes, nutritionists, and fitness instructors
- Promoting female involvement in STEM careers by allowing the girls to assemble low cost medical devices which will be sent to hospitals in the developing world
- Integrating these activities to allow further self-confidence development in girls giving them ability to make positive choices in academics, extra-curricular activities, and positive choices as it concerns their own health and well-being

The Kenan Biddle collaboration grant will allow for effective implementation of this partnership by providing the proper financial means in order to execute these initiatives.

Faculty Member Assessment of Ability to Work Across Departmental or Institutional Boundaries

Dr. Karl Umble
Adjunct Assistant Professor: Health Behavior
Program Planner/Evaluator: NC Institute for Public Health
Gillings School of Global Public Health, University of North Carolina at Chapel Hill

Dr. Karl Umble has been with the North Carolina Institute for Public Health at the UNC Gillings School of Global Public Health for 14 years. The majority of his work has included designing and evaluating continuing professional development programs for senior public health officials working for federal, state, and local agencies, foundations, and not-for-profit organizations. Dr. Umble's work has been interdisciplinary in several respects. Umble has served as Evaluation Lead for the Management Academy for Public Health and the National Public Health Leadership Institute at UNC. These programs were full collaborations between the Gillings SPH and the Kenan-Flagler Business School at UNC. Umble worked directly with faculty and staff at the SPH and Kenan-Flagler to plan curricula, teaching and learning activities, and process and conduct impact evaluations of these

programs. This work has culminated in many peer-reviewed publications documenting the impact of these programs. Umble's work as a program evaluator has also included extensive consultation work with the Centers for Disease Control and Prevention (Atlanta, GA), including evaluating large training programs offered by the CDC's National Immunization Program and the Sustainable Management Development Program. Umble is currently working extensively with the Public Health Informatics Institute in Atlanta as a program evaluator, bringing adult learning theory and practice together with implementation science to advise this group on how to improve the ability of agencies to design information and data systems. Umble has experience in state public health agencies, public school systems, and urban youth development before obtaining his doctorate, and is interested in building collaborations across these kinds of organizations to improve health and human development. Umble's expertise is itself interdisciplinary, combining adult and continuing education, program evaluation, public health, and management and leadership development.

Dr. Robert Malkin
Professor: Practice and Director of Engineering World Health
Duke University

Dr. Robert Malkin is the founder of Engineering World Health and the Global Public Service Academies. These unique study abroad programs allow undergraduates (EWH) and high school students (GPSA) to study and work in developing world healthcare settings. Dr. Malkin also conducts research and development focused on medical equipment in the developing world.

Previously, he was the Herbert Herff Professor of Biomedical Engineering at The University of Memphis in Memphis, Tennessee and The University of Tennessee. Before moving to Tennessee, Dr. Malkin was a professor of Electrical Engineering at The City College of New York and a member of the graduate faculty at The City University of New York and a research associate at Columbia University. Dr. Malkin has received numerous awards, including service awards from The Republic of Nicaragua; IEEE – Memphis, EM Microelectronics and Cordis Corporation; the Jefferson Award (the Nobel prize of public service), an Outstanding Faculty Research Award from The College of Engineering, an Established Investigator Award from the American Heart Association and an award for Innovation and Excellence in Undergraduate Education from The President of The City College of New York.

Professor Malkin's work on medical instrumentation in the developing world has been supported by Engineering World Health, The National Institutes of Health, The American Heart Association, The Whitaker Foundation, the National Science Foundation and other organizations. The DHT-Lab runs educational programs such as the EWH Summer Institute and formal classes and provides research and product development opportunities for undergraduates interested in developing world healthcare technology.

Statement of Background for the Project

Christine and Camille met last year during the Clinton Global Initiative University Conference at George Washington University in Washington, DC. They were both chosen among hundreds of applicants to receive commitment announcements at the Public Health working sessions- "The Last Mile: Delivering Health Technologies to the Hardest to Reach" and "Making an Impact: The Youth Movement for Global Health" (respectively) for their start-up programs. Camille and Christine knew that their projects had a similar mission and they wanted to collaborate because of the common location. The Kenan Biddle collaboration grant is the perfect way to begin this partnership.

Healthy Girls Save the World Background: Healthy Girls Save the World (HGSW) began in August 2011 and has held eight different events since its inception. The program has touched the lives of about one hundred girls within the community and this grant would help to broaden the reach as a partner with Girls Engineering Change. Healthy Girls Save the World has collaborated with the UNC Women's basketball, field hockey, soccer, swim, and volleyball teams as well as the UNC School of Public Health, NC Pilates, Goldsmith Kung Fu, Zumbatomic, and several other community based institutions and UNC student organizations. The participants in Healthy Girls Save the World would greatly benefit from a concrete collaboration with Girls Engineering Change and this collaboration would intrinsically help our efforts to promote healthy minds, healthy bodies, and healthy relationships for girls.

Girls Engineering Change Background: Girls Engineering Change began in summer 2012 and has hosted one official and one pilot session to date. This project stemmed from founder Christine Schindler's desire to encourage more girls to pursue degrees in engineering when she reflected on the lack of support she received from her peers when explaining her interest in the field. The program has drawn students from throughout Durham and partnered them with mentors in their first few years of college who are studying engineering. It would be a fantastic opportunity for Girls Engineering Change to partner with Health Girls Save the World to promote the self-confidence girls need to place themselves in a traditionally male dominated field such as engineering.

Expected Products and Presentations

The grant from the Kenan Biddle partnership will allow Healthy Girls Engineering Change to host three free events for girls in Durham and Chapel Hill. Each event will follow a similar agenda of activities as the noted in the "Schedule of Proposed Activities". The events will be held throughout the 2013 fiscal year. Healthy Girls Engineering Change is also in the process of seeking other

funding opportunities for this project so that it will become a sustainable program for girls to hold membership. The programming will remain completely free to participants as we will use university facilities and student volunteers to help with event implementation.

Detailed Budget

Healthy Girls Engineering Change Budget			
Events	**Cost Per Event**	**# of Events**	**Total Cost**
Supplies (ice holders, utensils, tablecloths, balloons, labels, folders, nametags etc.)	$115.00	3	$345.00
Medical Devices	$750.00	3	$2250.00
Food	$250.00	3	$750.00
Gym/Dance Ballroom Rental	$30.00	3	$90.00
Equipment	**Cost per Iron**	**# of Irons**	**Total Cost**
Soldering Irons	$50.00	20	$1000.00
Yearly Upkeep/General Administration	**Cost Per Item**	**#**	**Total Cost**
Website	$300.00	2	$300.00
Marketing Materials	$265.00	1	$265.00
Total Cost			$5000.00

Budget Justification

Events

Event Supplies: Items used for event implementation and execution. These items and amounts per event my change depending upon event theme and amount of participants. These items usually include but are not limited to ice holders, utensils, tablecloths, balloons, labels, folders, nametags, pens/pencils, clipboards, paint, crayons, etc.

Medical Devices: The engineering portion of our events will include a time for girls to create electrosurgery unit testers. These items are purchased from Engineering World Health and they cost $30.00 per device- each girl has a partner and together they create one electrosurgery unit tester. If HGEC hosts 50 girls for one event then it will cost ($30.00x25) 750.00 per event.

Food: Food is generally purchased from a deli or local restaurant (Jason's Deli, Mediterranean Deli, Subway, Jimmy John's, and Panera etc.). The sandwiches that are bought are usually subsided with fruit, grain bars, and water bottles that are bought separately.

Gym/Dance/Ballroom Rental: If an event needs a gym or space for vigorous physical activity a gym or dance ballroom on campus may be rented for a few hours.

Equipment

Soldering Irons: These devices are used as a heating element to melt items for the creation of the electrosurgery unit tester. This is a one-time fixed cost.

Yearly Up-Keep/ General Administration

Website: This cost will aid in website upkeep and the domain yearly repurchase.

Marketing Materials: This will cover the costs associated with printing flyers, brochures, t-shirt creation, and other expenses related to community promotion.

CAMILLE MCGIRT

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EDUCATION

University of North Carolina at Chapel Hill- Gillings School of Global Public Health
Chapel Hill, NC
BS in Public Health, Health Policy and Management, GPA 3.303
Class of 2013

PROFESSIONAL EXPERIENCE

The White House Internship: A Public Service Leadership Program September 2010 - December 2010
Office of Presidential Personnel, Energy and Environment Cluster Intern
Washington, DC

- Worked with staff to respond to potential presidential appointment candidates, communicated with departments and agencies on personnel matters, and ensured personnel priorities of the administration were addressed.
- Participated in a long-term service project to help the surrounding community, attended weekly speaker series with senior staff members, gave East Wing tours, and participated in off-site field trips around DC.

U.S. House of Representatives: Office of Congressman Emanuel Cleaver (D-MO) January 2011 - May 2011
Press/Communications Intern
Washington, DC

- Consolidated press clips for the Congressman and members of the Congressional Black Caucus on a daily basis; communicated with reporters and press for interview confirmations for the Congressman; researched and drafted press releases, media alerts, statements, and talking points for the Congressman

COMMUNITY/PUBLIC SERVICE

Healthy Girls Save the World January 2011 - Present
Founder
Durham, NC

- Program initiated to promote healthy minds, healthy bodies, and healthy relationships for girls ages 8-15 in NC's 4th district.
- Independently spear heads and organizes all meetings, events, and sessions for all volunteers and participants.
- Serves as main community liaison, grant researcher, website manager, and volunteer coordinator.

ACADEMIC EXPERIENCE

Semester in Washington Politics Program (SIWP) January 2011 - May 2011
Student, George Washington University
Washington, DC

- Enrolled as a student at George Washington University and completed course work framed to gain extensive knowledge of legislative & electoral processes, politics, government, and lobbying.

PROFESSIONAL DEVELOPMENT

Management Leadership for Tomorrow July 2010 - Present
Career Prep Program Fellow
New York, NY

- Selected as one of 200 from a nationwide pool of minority candidates for this intensive one-year career development program.

CAMPUS INVOLVEMENT

UNC Student Admissions Ambassador October 2011-Present

Admissions Ambassador
Chapel Hill, NC
- Offers campus tours to prospective students and parents, helps to run recruitment events for high-achieving or admitted students, places phone calls to admitted students to both congratulate them on their acceptance and answer questions.

Multicultural Student Recruitment Committee (MSRC) October 2011-Present
MSRC Select Member
Chapel Hill, NC
- Plays a major role in the implementation of recruitment programs and activities in Diversity and Multicultural Affairs Office, including but not limited to High School Honors Day, Project Uplift, and Pre-Orientation.

Public Service Scholars Program, Carolina Center for Public Service October 2011- Present
Public Service Scholar
Chapel Hill, NC
- Learns about and practices public service and engagement beyond the scope of traditional volunteerism, including organizational service, policy and advocacy work, fundraising and philanthropy

AWARDS
Pearson Foundation
July 2012
Pearson Prize
New York, NY

Gallagher Koster Health Careers Scholarship
August 2012
Boston, MA

Liberty Mutual Responsible Scholars Scholarship
July 2012
Boston, MA

Maya Angleou Women's Center for Health and Wellness
August 2012
Winston Salem, NC

Clinton Global Initiative University Conference
April 2012
Commitment Announcement, Public Health Working Session
Washington, DC

Louis Stokes Health Scholars Program, Congressional Black Caucus Foundation
September 2011
Scholarship Recipient
Washington, DC

UNC Student Internal Team Members: These members work on the Healthy Girls Save the World team at UNC with volunteer coordination, parent outreach, social media communication, event planning, fund distribution, and several other administrative tasks.

Reena Gupta- Public Policy UNC-CH '15
Rani Reddi- Public Policy and Hispanic Linguistics UNC-CH '16
Tristine Johnson- Communications/Psychology UNC-CH '14
Jillian Griffith- Nutrition, Chemistry Minor UNC-CH '14

Kristen Bowen- Information Library Science UNC-CH ‘13
Megan Mukenge- Nutrition UNC-CH ‘16

Christine Schindler

Ces64@duke.edu

571.732.6505

Education:
Duke University, Pratt School of Engineering
Class of 2015
Major: Biomedical Engineering
Certificate: Global Health

Campus Involvements:

Duke Partnership for Service
Executive Team, Vice President of Freshmen Connect (2012-Present)
Freshmen Connect Team (2011-2012)
dPS freshmen connect team strives to connect freshmen to service opportunities in Durham and beyond

Duke Engineering World Health Chapter
Executive Team, Vice President (2012- Present)
Research Team member (2011-Present)
Design and Development of medical and healthcare technologies for the developing world

Coalition for a Conflict free Duke
Board Member (2011- Present)
Works to educate students and the community and increase activism with respect to the war in the Democratic Republic of the Congo

Duke Student Government
Senator for Durham and Regional Affairs (2011-2012)

Project BUILD pre-orientation Program
Crew Leader (2012)
Supporting freshmen in the week prior to entering school through service opportunities in Durham

Engineering-Team
Mentor (2012)
Mentoring freshmen who are entering the Pratt school of Engineering prior to their arrival and during their first few weeks on campus

Admissions Ambassador
Campus Tour Guide (2012-Present)

Alpha Phi Sorority
Member Development Committee Representative (2012- Present)
Works to address low morale issues with girls in the chapter and promote healthy lifestyles

Duke Catholic Center
Small Group Leader (2012- Present)
Organize and lead small group discussions on faith each week

Awards:
Julie Anne Levey Leadership Award Recipient (2012)
Clinton Global Initiative University Recognized Commitment (2012)
Clinton Global Initiative America Participant (2012)
Class of 2015 Service Award Recipient (2012)

Duke University Internal Team Members: These Duke students work with Girls Engineering Change's program development initiatives and administrative tasks. This includes but is not limited to grant proposal writing, event planning, communication with EWH, purchasing of materials, local school contact, marketing material distribution, website production and volunteer/mentor outreach.

Karmyn McKnight- Electrical Engineering Duke '15
Jessica Allen- Mechanical Engineering '15
Dutch Waanders- Biomedical Engineering '15