Cover Sheet

Project Title: **Tech Captains**: Computer Programming and App Development with multi-platform, open source, LiveCode, www.LiveCode.org.

Organization: Bloomfield-Garfield Corporation

Address: 5149 Penn Avenue, Pittsburgh, PA 15224

Primary and Proposal Leader's Contact Name, Title, Email, Phone

* Rick Swartz, Executive Director, RickS@bloomfield-garfield.org, 412-441-6950

* Mark Rauterkus, Coach, Mark@Bloofield-Garfield.org, 412-298-3432

Organization's Website: http://www.Bloomfield-Garfield.org

Amount of Funding Requested (up to $10,000): $8,000 per semester per school site.

Proposed School /Area to be Served: Pittsburgh Obama Academy as first choice. But, could also be Pittsburgh's Sci-Tech, Brashear, Perry, Westinghouse and/or Allderdice.

Number of Participants You Expect to be Serve: Twenty students per site in first year. More as space and budget permits. Willing to launch up to four school sites in 2015.

Program Location(s): Activities are conducted in computer labs within the schools. As projects evolve, swim pool and gym spaces would be scheduled so documented fitness content can be recorded on digital cameras.

Project Summary: This effort calls for the formation of long-term, school-based, sustainable, computer programming clubs called, **Tech Captains**. Our **Tech Captains** craft compelling operational positions with a social, team purpose. The computing cause is more than first-person study and advancement. The open-source projects are playful, social, relevant, urgent and mindfully near-and-dear to the students. Job opportunities are a central mission. Mentoring, professional interactions and peer presentations are commonplace.

This **Tech Captains** approach solves a suite of problems associated with school settings: hardware, software, networks, delivery devices, and adult interest. This fix: Bringing our own toys. School PCs are seldom used, and if so, in "super safe modes" (i.e., watching tutorials). **Tech Captains** deploy with:
* Community version of LiveCode software. Costs $0 to everyone.
* Raspberry Pi, a Linux-based computer that is compact (size of deck of cards) and affordable ($35 each).
* 7-inch Andoid tablets, $35 each via bulk imports.
* Wifi hotspots outside of school networks, i.e., Clear Communications, YourKarma.

LiveCode is open-source, multi-platform software that allows anyone to code. LiveCode apps run on Windows, Macintosh, Android, iOS (iPones & iPads), Linux, servers, and especially for **Tech Captains**, Raspberry Pi. LiveCode is robust yet simple and enables students to create their own mobile apps and/or stand-alone software programs. With LiveCode, **Tech Captains** open doors to technology by creating in a platform that truly engages. But Tech Captains don't focus on technology for tech's sake. Rather, we visualize ourselves, our sweat,

our actions (such as our water polo plays) within our screen displays. Kids are excited to create a mobile app about themselves that runs on their devices. LiveCode is relevant because it supports the popular devices students use.

Quickly and easily students can build apps that they can deploy to their Android phones. With LiveCode, first time students just get it. Students can easily get up and running with LiveCode and see their ideas come to life digitally. LiveCode closes the gap between student's favorite game or app and their work, allowing them to realize they could build the next app everyone enjoys. Livecode is easy to learn and easy to teach. Learning programming with LiveCode presents tutorials from worldwide sources. Within LiveCode, **Tech Captains** get to cover all areas of programming in one package – from development to animation, graphics to data management. LiveCode's depth and breath is unmatched among today's high-tech options. LiveCode's simple-to-use, English-language code removes symbol-heavy code that is a barrier to many students. LiveCode has a proven track record of increasing class sizes and pass rates. Schools throughout the world teach coding with LiveCode, including a quarter of the schools in Scottland. Students enjoy learning on LiveCode.

Games, simulations, utilities, business and social-media apps are possible. LiveCode mades a complete solution to teaching programming, and it inspires and excites students. LiveCode lets you create full featured apps, faster and easier, without compromise. Even HTML5 web apps are possible with LiveCode in 2015.

Application Questions:

1.   Who are you? (Include information on your group/organization and any partners) The BGC is a non-profit agency with a rich, Pittsburgh history. The BGC impacts children, families, businesses and Pittsburgh's neighborhoods with many programs including the BGC's sponsoring of Swim & Water Polo Camp as part of Pittsburgh Public Schools' Summer Dreamers Academy, with Mark Rauterkus, executive coach. Rauterkus coaches at Obama Academy and is also head coach of women's water polo at Carnegie Mellon University.

2.   What experience do you have with high schools and high school students? Coach Mark Rauterkus has been starting, growing and directing youth and school-based teams since 1976. Rauterkus gets students self-motivated and energized for meaningful tasks and accomplishments in afterschool times with opt-in programs. The holistic approach helps, as does tech and literacy elements from Rauterkus' past publishing background.

3.   Who is your target audience/s? High school students are the prime audience. Students of every grade and gender are desired. HS students seeking financial gain are welcome. Some may be motivated for a career as free-lance computer programmers. All interested get jobs by working on the staff of the BGC Summer Dreamers Swim & Water Polo Camp as swim instructors and athletic coaches.

Day 1 recruiting seeks "computer programmers" within the student body. The most devoted and motivated students form the Tech Core for the **Tech Captains**. APOST surveys suggest that computer programming is in high-demand. On Day 2, we recruit to the various school-based groups, clubs and teams. We seek to sign up one member per grade from each activity. Join and become your team's **Tech Captains**.

Mentors make a secondary audience. Adults, teachers, coaches, volunteers, programmers, guests and community business folks are to be pulled into the endeavors of the **Tech Captains** as soon as Week 2.

4.   What are you proposing? (Please give details about your initiative) We are making a computer club that works to produce real-world solutions with hardware (Raspberry Pi), open-source software (LiveCode), content (Swim & Water Polo apps). Relevant challenges, provided by student input, are tackled.

Tech Captains can meet up to four-times a week. A typical week of 2-hour sessions: Mondays: business roundtable with CEO presentations. Tuesdays: Independent learning. Wednesdays: Peer-teaching. Thursdays: Play day with outward focus and discovery.

5.   What are you hoping to accomplish?

* Develop apps on LiveCode for Android tablets for use within the BGC's Swim & Water Polo Camp.
* Sustain lesson plans and craft content for Mindful segments within Swim & Water Polo Camp, varsity teams and the Mindful Eating to launch in 2015 Summer Dreamers.
* Interject LiveCode learning into the school settings in PPS in ways beyond traditional class periods.
* Use computer lab classrooms, monitors, keyboards and mice but utilize alternative PCs (Raspberry Pi) and networks (wifi hotspots).
* Ebooks, playbooks, and presentation channels are expected accomplishments.

6.   Why do you think this will work? These efforts would not have been possible until 2015, but **Tech Captains** can succeed now because of the release of LiveCode 7 and its Raspberry Pi distro.

This will work because leadership credibility can drive a clear path for growth. We aim to grow the program by attracting kids from a wide range of teams and interests including swim team members, baseball/softball players, band, drama and lifeguard candidates. All sorts of activities of the school have connections to technology and provide the base that makes these participants **Tech Captains**. They identify, address and tackle challenges central to the happening of their teams and social groups.

This plan will work because a treasure chest of captured content is available presently. Plenty of files are nearly ready for prime-time release in more public titles in the form of new handbooks, software and mobile apps. As we begin, we'll sit down and see fun photos, videos and concepts that look like shared experiences from last summer. The newest content comes from Mindful Pittsburgh. However game footage, ebook content and exercise routines are recently obtained. Historical book content the archives of the Sports Support Syndicate and commercial swim products from Tropical Penguin are ready for repositioning by student coders.

This plan will work because the BGC's employment center can host classes that **Tech Captains** attend and one-day deliver to others.

This plan will work because there is a great cause at work here. People in Scotland care that we learn good interface designs. **Tech Captians** efforts can cascade into a Convention Center event called the Youth Technology Summit. The new Western PA LiveCode User Group helps to insure that this effort flourishes. Professors at BYU and Univ. of Georgia are helping to make sure that these apps get finished.

7.   *How will you use the funds?* Staffing = 45%. Overhead and insurance = 5%. Hardware = 25% (Raspberry Pi, Tablets, PC, Server, Cameras). Networking = 15% (Routers, ISP, Wifi). PR = 7% (auto dial, postage, printing, signs, swag). Storage = 3% (bags, cabinets, used furniture).

Missing: Food. Transportation. Travel. Conference attendance. Academic subscriptions. Commercial licenses. Apple Developer Fees. Educational lesson plans. Text books.

See the budget below.

8.   *How will your initiative change if you don't receive your full requested amount?* A funding grant within the Raspberry Pi movement is available that could double the start-up money obtained from NLA for **Tech Captains**. See http://www.raspberrypi.org/education-fund/

Crowd-source options have been seriously considered since September 2014. The first wave would be with Indiegogo to obtain the development devices (Raspberry Pi computers) and some 7-inch Android tablets for the Obama swim team and CMU water polo team. Goal: $16,000. The second wave (via Kickstarter) would fund enhanced literacy efforts of BGC's Summer Dreamers Swim & Water Polo Camp. We want every 2015 participant with great attendance to be able to keep a 7-inch Android tablet utilized in the camp experience. Goal: $60,000. The 2015 plans call for 310 Summer Dreamer students.

Plans for 2015 Summer Dreamers Swim & Water Polo Camp with the BGC and Pittsburgh Public School have been submitted and await final decisions from PPS. Likewise, program announcements with Mindful Pittsburgh, Citiparks and Varsity Water Polo at Obama Academy (to begin in August 2015) are expected. Discussions with funders welcome.

The initiative has a private phase of app and content creation regardless of this proposal's outcome.

A commitment to at least prototype **Tech Captians** with some larger institutional support is necessary. This goes above and beyond athletes doing athletic activities. This can't be bootstrapped without funding. If no funding comes, then we'll continue to work hard at swimming fast, playing better water polo.

Sponsors such as the YMCA, Citiparks, a City Council Member, the Mayor, or School Principals could step up and support the **Tech Captains**. But frankly, those sponsors should be supporters that can drive interest among possible participants. And, getting sponsors for the water polo and swimming teams is an easier request.

9. *Do you see this effort as ongoing? If yes, how do you see it being sustained?* **Tech Captains** can pull its own weight and earn grants and income to grown for years to come.

Tech Captains can assist and teach community classes such as swimming lessons, aquatic game days, fitness squads. PPS Varsity Swimmers and athletes have been a great help in the past five years as swim instructors and assistant coaches in the Swim & Water Polo Camps as part of PPS Summer Dreamers. Relationshps built with opt-in school programs leads to jobs and opportunities to help younger kids in the communities. Year-round programs at the pools are desired and these efforts of the **Tech Captains** build synergy, capacity and speed for more universal, year-round swimming and fitness for the city. Additional program proposals are being directed to APOST in 2015 that include **The Guard**, **Swim & Water Polo** at Westinghouse.

By 2016, **Tech Captains** could teach community classes on LiveCode, Raspberry Pi, simple web site development, LibreOffice, Podcasting, Video Production, Multimedia and Concept Mapping. Lower level computer consulting could be within the reach of the more proficient high school students. User fees can be used to pay for the time for employees and help to sustain the overall **Tech Captains** program. The Community Learning Outreach Hub can launch in 2016.

By 2017, both business plans and skilled personnel can emerge from the ranks of the **Tech Captains** to solicit $5,000 donations from boosters in return for LiveCode app development. Many small businesses around the region might appreciate an opportunity to invest some cash and capital to obtain a customized, mobile app for their business needs from a team of highly energetic and competent PPS students. See http://tinyurl.com/mcxk538 for a prior AlphaLab seed investment that was not funded in 2013.

Budget:

Tech Captains

Budget		$8,000.00	
Number of students			20

Spring Semester 2015			Aid per student
Staffing	45%	$3,600.00	$180.00
Overhead & Insurance	5%	$400.00	$20.00
Hardware *	25%	$2,000.00	$100.00
Networking	15%	$1,200.00	$60.00
PR	7%	$560.00	$28.00
Storage	3%	$240.00	$12.00

Part Time Staffing	
Weeks	15
Days per week	4
Hours per day	3
# of employees	1
Total hours of program	180
$ per hour	$20.00
	$3,600.00

* Budget Notes on the Raspberry Pi: **Tech Captains** earn digital badges and grow in status then get to keep their own devices, i.e., Rasperry Pi, tablets, useful doo-hickeys to make playing with the Rasberry Pi more fun. Devices are issued to the students from NLA after certain proficiencies and merits are achieved within club activities.

The Raspberry Pi computer, open-sourced, Linux-based, is of a size similar to a deck of cards and costs \$35 (case, monitor, keyboard, and mouse not included). The Raspberry Pi has been in development since 2006 from a foundation at the computer lab in University of Cambridge, UK. The Raspberry Pi Foundation, www.raspberrypi.org, is an educational charity to advance the education of adults and children, particularly in the field of computers, computer science and related subjects.

The Raspberry Pi was built because of concerns about the year-on-year decline in the numbers and skills levels of the A Level students applying to Computer Science. In the 1990s, most of the kids applying were experienced hobbyist programmers. By the 2000s, skills of kids were very different. A typical applicant might only have done a little web design. Something had changed the way kids were interacting with computers. A number of problems were identified including inadequate school curriculum and the end of the dot-com financial bubble.

The Raspberry Pi address school and home hardware situations where computers are off limits to programming experimentation and "jail breaking." Much is forbidden by parents, schools and manufacturers. Older computers do not easily boot into programming environments. Institutional PCs and networks are locked down tight.

Processors designed for mobile devices are more affordable, and powerful enough to provide excellent multimedia, a feature desirable to kids. The Raspberry Pi goes far beyond a purely programming-oriented device. Within two years, the Raspberry Pi Model B sold more than two million units. Raspberry Pi is a catalyst to affordable, programmable computers that breaks a paradigm, especially for price and absence of the internet. Owning a truly personal computer can be normal for **Tech Captains** with the Raspberry Pi. Programming on it can happen with LiveCode.

Development of Linux, Raspberry Pi and LiveCode have been community-based activities. Likewise, so goes **Tech Captains** and a bridge into our Pittsburgh Public Schools.