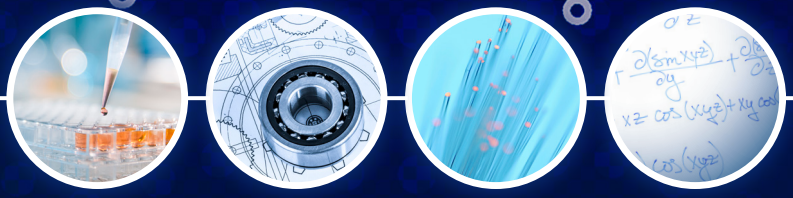
Long Island Science, Technology, Engineering and Mathematics (STEM)

Gap Analysis Report

A review of STEM programming on Long Island



Produced in support of the Long Island STEM Hub

AUGUST 2013

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This report was produced in support of the Long Island STEM Hub. The Long Island STEM Hub seeks to develop an integrated, effective, systematic and cohesive regional approach to preparing students for the local workforce by enhancing student and teacher experiences in science, technology, engineering and math (STEM). This report is intended to provide a first look at the STEM programming provided on Long Island and to assess where new programming might be best focused to improve STEM enrichment opportunities for Long Island community.

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Long Island STEM Hub Gap Analysis Report
Executive Summary

Long Island has long been recognized for the quality of its academic institutions and the aptitude and potential of its student population. The region is also known for its extensive capabilities in science, engineering, and technology. Industries founded on aerospace and defense continue to be important to Long Island's economy and new sectors like computing, biotech and advanced manufacturing have provided diversification. Sustaining the region's economic strength and growth in future markets requires a well qualified workforce prepared for careers in science, technology, engineering and math, commonly referred to as STEM. Long Island students are capable of attaining the necessary skill sets for joining the STEM workforce, and in fact, many do. However, as with most parts of the nation, fewer students are choosing STEM careers. Preserving, and building the status of, Long Island as a high tech region that is attractive to industry will require a concerted effort focused on building it's STEM workforce.

Motivating greater numbers of students to prepare for these careers, and to persist in the studies required to be successful, will require a suite of efforts targeted at students, teachers, parents, schools and businesses. The research conducted for this report is one such effort. Based on the research, a database of non-formal academic STEM educational opportunities offered in the Long Island area was created. This data will serve as a resource for Long Island residents who seek STEM programs for students and educators. The compilation of these programs into a database allows for the assessment of Long Island's STEM enrichment across multiple criteria such as provider, location, grade-level, subject matter, etc. This assessment, or gap analysis, will drive informed development of programs and collaborations by the numerous STEM education providers across the region as they create programs in areas where few or none exist.

Capturing the extensive data for STEM educational programming across Long Island was quite challenging and this report reflects some, but certainly not all, the STEM programming on Long Island. While significant, the data collected for this report is only a starting point and continued efforts will be applied towards gathering additional input and to developing a data maintenance process. Although further efforts are required, the data collected suggests several areas where gaps exist in the provision of STEM programming and it reveals important information on the sources of this programming. Key observations from the data suggest the following:

- School districts are a primary source a parent should look to for local opportunities for students to participate in STEM after school activities at the secondary level. Opportunities at the K-8 levels from this source are limited.

- Informal education sources such as museums and not-for-profit organizations are significant contributors to discipline specific STEM programs.
- Career and technical education programs from Long Island's Board of Cooperative Educational Services, the exception to this report's review of non-formal academic programming, provide opportunities for STEM career preparation. Some school districts offer similar career and technical education programming.
- It is evident that workplace experience opportunities (internships) for students in STEM based is inadequate to meet demand.
- Professional development opportunities for educators teaching STEM content are particularly limited in workplace experience opportunities, and in content areas such as the physical sciences, engineering and mathematics.

The data collected and complied through the STEM gap analysis project can be accessed by the public through the Connect to Tech search engine on Long Island STEM Hub's website, www.limstemhub.org. With the STEM data available for the public in one location, it allows for easier research and access to STEM enrichment programs using a variety of criteria. An impact anticipated through collecting, documenting and presenting the research is greater identification of the connection between enrichment programs and high tech job opportunities. This connection may increase the involvement of the institutes represented in the data due to higher demand of STEM programs from students, parents and teachers.

The STEM gap analysis project is beginning to reveal the gaps in STEM educational programs across the region. While in its formative stage, the data collected so far allows for analysis of the aspects of enrichment programming that are lacking. The results and observations to date, and the development of search capabilities for Long Island STEM programs are proving useful and provide encouragement to continue this project.

The project to date has been undertaken by Brookhaven National Laboratory (BNL) and the Long Island Matrix for Science and Technology (LIMSAT). Support has been provided to LIMSAT by the Long Island Community Foundation through a grant. BNL has been supported from Brookhaven Science Associates, the management contractor for BNL, and the U.S. Department of Energy as part of ongoing support of the next generation STEM workforce. Additional support has been provided through a grant from the New York Empire State Development Corporation.

Introduction

Long Island's educational environment provides numerous opportunities for engaging students of all ages in the Science, Technology, Engineering and Mathematics (STEM) disciplines and demonstrates the commitment of its students to science through its excellent showing in such nationally recognized science competitions as the Intel Science Talent Search, the Siemens Competition in Science, Math, and Technology, and others. Yet too few Long Island students have access to these programs and of those that do, too few choose to pursue careers in STEM based fields regardless of their capabilities in these areas. If Long Island is to remain economically competitive, we must encourage more of our young talent to persist in STEM academics and focus their studies and aspirations in the careers with the greatest potential for employment and growth in our region. Multiple efforts are underway to address this long-standing, difficult challenge.

This gap analysis project, or more appropriately STEM asset mapping project, is a start toward cataloguing the STEM programs available to Long Island students and teachers. This information is the beginning of an assessment of the gaps in opportunities for exploration and study in STEM disciplines. Furthermore, it begins to provide the information necessary to determine if programs are aligned with anticipated regional industry needs for industry growth sectors identified by the Long Island Regional Economic Development Council. Currently, no single central directory of the myriad programs and courses available on Long Island has been compiled and made available to those interested in furthering their STEM studies. This report represents a preliminary collection of data as a start toward developing a comprehensive listing of STEM programs offered on Long Island and a beginning attempt to assess the availability of these programs for the various audiences. It is intended that understanding this information will inform a more cohesive approach to offering STEM programming to students and their teachers who do not currently have access, and developing new STEM programming where it is insufficient to support our high tech industry sectors.

Another general goal for this project is to compile and maintain a searchable directory of all STEM related programs throughout Long Island. To meet that goal, a comprehensive survey tool was developed to gather data describing the available programs. Data collected during this phase has been published to a searchable web site developed by Connect to Tech, S.T.E.M.search, in partnership with the Long Island STEM Hub. This database now facilitates searches to locate activities, courses, and programs related to the STEM disciplines based on interest, academic level, and other related parameters. This survey also begins to provide the information necessary to conduct an analysis of the availability and extent of opportunities for STEM related educational programs on Long Island. It is recognized that the data contained within this first attempt at understanding the depth and breadth of the STEM offerings on Long Island has limitations, but it serves as a foundation for adding more information as the project progresses and awareness grows.

Since this project is in its formative stages, this gap analysis explores both the nature of the gaps in STEM related programs throughout Long Island and the areas for improvement in data gathering and dissemination. The current data collected represents a first pass through the STEM programs and it continues to be refined, therefore, the data presented here should be thought of as preliminary observations. The process of collecting this data illuminated both the vastness of STEM offerings on Long Island, and the challenges presented to a student or parent trying to sift through the available information to find the desired resources.

Background

This need for this project emerged as efforts to establish the Long Island STEM Hub as one of ten regions in the Empire State STEM Learning Network were taking place. Formally established on December 6, 2011, the Long Island STEM Hub seeks to develop more cohesive and beneficial relationships between organizations providing STEM programming in informal settings and academic institutions, and Long Island industries which rely on a prepared STEM workforce. The gap analysis for STEM programs on Long Island is one of the early projects in the STEM Hub. A better understanding of who offers programs and to which audiences will enable the Long Island community to better address inequities in opportunity for students. It will also illuminate where programs needed to support the Long Island STEM workforce simply do not exist. Gaining this information will provide additional rationale for future grant submissions targeted toward known gaps in student or teacher professional development opportunities.

Project Goals

The following goals for this project were established to better track and explore STEM programs throughout Long Island.

1. **Gather data** that defines the STEM opportunities for students on Long Island by querying formal and informal educational institutions, businesses, and government organizations that offer STEM related projects for student participation. Data related to formal academic programming has not been included in this effort with the exception of some programs associated with local Board of Cooperative Educational Services (BOCES).

2. **Document the projects**, courses, and other opportunities available to include which STEM topics are being emphasized, where the opportunities are being offered, and how to contact the organizations offering these courses so that a student may take advantage of them.

3. **Assess the data** gathered to explore the state of current program offerings to gain insight into the availability of programs for all students and determine which areas of STEM education may benefit from additional development.

4. **Maintain the data** by establishing a means to continue gathering data so that the project directory contains current information for each program, facilitates the addition of new programs, and enables updates to be entered in a timely manner.

Progress Toward Goals

The current status of the efforts toward achieving the goals defined above follows. Working from these benchmarks, this report identifies opportunities to further advance the quantity and quality of the available data, and refinements that will increase long-term usability by end users.

1. Gather data

The initial effort at data gathering was directed toward the identification of as many sources of informal STEM education service providers and programs as possible. No attempt was made to capture formal education (credit bearing or standard classroom programming) programs offered through academic institutions, with the exception of BOCES noted above. During data collection it became clear that the Long Island BOCES career and technical education programs offer more STEM programs than the data collection contains. The survey did include after school STEM-based clubs and activities for a sampling of approximately 20% of the roughly 126 K-12 school districts on Long Island. Collecting this data proved to be challenging and labor intensive. A first attempt at data collection included a pilot survey with targeted service providers who were well known partners. Even with established relationships and follow up telephone calls, the process yielded marginal results. Following a formative assessment, the survey was revisited and the database was revised. A team was then tasked with conducting an independent search of internet sites for known STEM program providers identified based on the knowledge of numerous STEM experts on Long Island. This process worked much better and resulted in a substantive database of over 850 informal STEM programs offered in the Long Island region. The basis for the balance of this report is the outcome of this latter process. Follow up actions will include a request to the service providers to validate that the information is comprehensive, accurate and current. However, the data on the websites appeared to be current at the time of the review.

The full content of the survey used to accumulate the data being reported is available for viewing through the Connect to Tech search engine (S.T.E.M.Search) that can be accessed through the Long Island STEM Hub at www.listemhub.org. A partial breakdown of the survey content is provided below.

- Institution and type (museum, business, public school, etc.)
- Contact information
- Program description
- When offered - academic year, summer, after school, etc.
- Cost

- Target audience
- Relationship to regional economic development industry growth sectors

Data was collected from 83 different organizations providing STEM based programs and activities. These included businesses, higher education, informal education, public and private schools and BOCES. Approximately 50 percent of the programs identified were provided through informal education sources such as museums and other not-for-profit organizations and institutions. Approximately 20 percent were provided by higher education institutions through non-credit bearing programs, or teacher professional development programs, supported with grant funds and others sources. Public schools provided about 20 percent as well through after school clubs and activities. If scaled up to an assessment of all school districts on Long Island, it is estimated that over 50 percent of the STEM enrichment opportunities for students are to be found in their local school district. BOCES career and technical education programs are formal education programs that offer STEM career preparation. A number of schools across Long Island offer career and technical education services as well. These programs, and after school STEM programming presents fertile ground for Long Island business engagement with their local school districts. One exemplary representative of how successful the business school relationship can be is the SBPLI FIRST Robotics competition.

The data collected suggests the following:

- School districts are one of the primary sources a parent should look to for local opportunities for a child to participate in STEM activities. This is particularly true at the secondary level. Important local school district sources include clubs, competition support, and related types of activities during after school hours. The data also indicates that for those school districts reviewed, opportunities at the K-8 levels beyond the standard academic programming are limited as are offerings during summer months.

- Long Island BOCES programs, particularly career and technical education programs, and similar programs provided by many school districts, should be considered for those interested in STEM careers.

- Informal education providers are a key source for K-8 opportunities outside of the classroom beyond that offered through clubs and competitions. Furthermore, the preliminary data suggests that informal education providers are a significant source of opportunities focused on specific STEM disciplines. These programs create opportunities for in-depth exploration of potential career areas by Long Island students, particularly at the secondary level where motivation and career awareness may have the greatest impact on academic pursuit. Organizations providing this type of programming for the Long Island region are well recognized leaders in STEM education and include: Brookhaven National Laboratory's Office of Educational Programs in partnership with the Long Island Matrix for Science and Technology, Cradle of Aviation Museum, Science Museum of Long Island, Long Island Science Center, Long Island Aquarium, Stony Brook Center for Excellence in Science and Mathematics, Cold Spring Harbor Dolan

DNA Learning Center and the Center for Science Teaching and Learning who runs this center? Should that be attached to the name?.

2. Document the STEM-Based Program Offerings

The ultimate goal of documenting the STEM programs offered on Long Island is two-fold. The first objective is to enable students, parents and teachers to have a single starting point, the Long Island Regional STEM Hub (www.listemhub.org), to begin a search for a STEM enrichment program in a specific area of interest that is appropriate for the audience by age and geography and to then provide the contact information necessary to pursue participation. The second objective is to document programs sufficiently to enable a review of offerings in specific STEM areas of interest for various ages and audiences, and in different geographic locations. The collection of this data supports an analysis of areas of STEM programming in which program development would benefit the Long Island community.

Ideally, understanding who offers which programs, and the consequent understanding of the strengths of our Long Island STEM resources, STEM program providers can independently, or collaboratively, work toward filling identified gaps. As an example, many studies have noted that the middle school level is one in which students begin to lose interest in science and mathematics or they begin to get a sense that it is too difficult to pursue. This is also the age when career awareness begins to have a significant impact. Strengthening programs in areas of high technology job growth for Long Island for a middle school target audience where none currently exist is desirable to provide relevance to academic coursework with an expected outcome of increasing persistence in STEM academics and career pursuit. Armed with this information, STEM providers can independently or collaboratively, submit grants focused on known areas of need. This in turn should provide a compelling case for the grant and increase the likelihood of an award from funding agencies and business partners.

Accordingly, each program record contains identifying information that, when displayed, allows for an informed choice for the program. A narrative description of the program is included along with contact information, location, cost, dates available, audience (grade level, professional development, etc.) and other information. Captured in a database, this information can now be queried to analyze a variety of characteristics of STEM programs currently available on Long Island. Additional analysis of the first pass data collection, additional data validation and input, and further discrimination of data associated with the programs, will be necessary to reach the full potential of the project. Another next step in the documentation of data and making it available to the public was to establish a query mechanism available on the web. To this end, LIMSAT and Brookhaven National Laboratory's Office of Educational Programs worked with the Connect-to-Tech organization to develop the necessary programming to manage and query the data. Connect-to-Tech is a partner in the Long Island STEM Hub leading the Information Technology Regional Industry Council. They have developed a search engine that makes the information available to the general public. The data collected for this project, along

with data they had previously collected, has been used to pilot the system which continues to be upgraded in function, data quality, and data management. This program is designed to work based on keyword searches and other query parameters.

A secondary impact expected to be realized from collecting the data and making it available to the general public is an increase in participation for those organizations represented by the data. As it becomes easier for the general public to identify opportunities for student enrichment in the STEM areas, and the connection to regional high tech jobs becomes clearer, it is anticipated that STEM program providers will experience further growth in program demand.

3. **Assess the Data**

The use of a database allows for queries of the dataset to discover the existence of a program that might meet the needs of someone who wants to explore a STEM related program, and to mine the data to explore the current status, distribution, and gaps in STEM programs throughout Long Island. While much work remains to be done to fully capture and break down the data on STEM programs offered on Long Island, the data collected thus far allows some preliminary analysis about STEM programming available to the local community. Listed below are some preliminary samples of these queries to demonstrate the state of STEM programs on Long Island.

Total student programs by STEM category

STEM Category	The STEM category integrated with other discipline(s)	The STEM category as the exclusive topic
Science	455	202
Technology	221	3
Engineering	143	7
Mathematics	184	18

Total teacher professional development programs by STEM category

STEM Category	The STEM category integrated with other discipline(s)	The STEM category as the exclusive topic
Science	94	30
Technology	73	14
Engineering	3	0
Mathematics	15	0

While all STEM categories are represented with programs that either contain or are devoted to each area, programs for students and teacher professional development that either contain or feature Engineering or Mathematics are underrepresented. When examined by programs devoted to students and to educators, the results indicate that while there are an extensive number of programs that contain multiple STEM categories,

with the exception of science, those programs devoted to only one area of STEM drop off precipitously. Furthermore, no teacher professional development programs specifically designed for Engineering and Mathematics were identified. While there may be integration of STEM areas in programs, there could be a significant opportunity for industry partners to make discipline/job specific programming available to students and teachers in partnership with schools and informal education providers. It can also be reasonably assumed that if teachers are not being offered professional development opportunities in engineering and mathematics, robust programming in those areas during and outside of normal school hours, or as electives is also less likely

4. **Maintain the Data**

Maintenance of the data collected and adding to this body information over time will require a systematic process. The longer term expectation to meet this challenge will be fulfilled by the Long Island Regional STEM Hub. As noted above, solutions to this challenge are already in progress through the STEM Hub with support from the Connect-to-Tech organization. As awareness of the STEM Hub and its utility grows, and if STEM providers see the anticipated increase in participation requests, more institutions will independently identify their programs for entry into the database. Maintenance of the database will also require a systematic process for program validation by STEM providers – policies and programming to support this process are in development.

Gap Analysis Using Current Dataset

The data collected thus far represents an extensive, yet preliminary, set of information. The inferences made from this data therefore are preliminary as well and will be revisited as more data is collected. However, sufficient data has been collected to make observations that begin to develop a profile of non-credit bearing STEM education on Long Island. The data does suggest some trends in the status, distribution, and range of STEM related programs throughout Long Island. Further data gathering will refine and either confirm or reject these general trends and observations. The following sample queries demonstrate the type of information available for further study.

Programs offered by school districts as defined by New York State Education Department's Need/Resource Capacity ratio

Of the approximately 126 school districts on Long Island, 25 were reviewed as part of this survey. Ranking the reviewed school districts by the NY State Education Department's Need/Resource

Demographics	County	Programs Available
Low N/RC Districts	Nassau	51
Low N/RC Districts	Suffolk	17
Average N/RC Districts	Nassau	13
Average N/RC Districts	Suffolk	36
High N/RC Urban-Suburban Districts	Nassau	5
High N/RC Urban-Suburban Districts	Suffolk	5

Capacity ratio (N/RC) indicates that school districts with low N/RC (i. e., districts with more resources) offered the most programs and those with high N/RC (i. e., districts with fewer resources) offered the fewest. It is important to note that this dataset's sample of school districts includes only 20 percent of Long Island's public school districts and more data is needed to substantiate this observation.

Internships

Seven percent of the programs, or 49 different programs, offer some sort of internship opportunity; 19 of the 49 programs offered paid internships. As one would expect, the identified internship programs were typically associated with business or industry offerings. An expanded dataset focused on business and industry may reveal additional opportunities. The number of programs supporting internships seems significant. However, discussions with academic partners and students seeking internships without success, and the demonstrated overwhelming number of requests to those offering internships, would indicate that much more attention needs to be given to developing internship opportunities for businesses of import to Long Island. This, and the fact that there are no identified opportunities for teacher work experiences in industry, is an area of focus for the Long Island Regional STEM Hub. Engaging teachers, particularly STEM discipline teachers, in opportunities to experience high tech work settings is considered a priority for the Long Island STEM Hub and presents an area for Long Island STEM based businesses to make a significant difference in how STEM subjects are taught in Long Island schools.

Distribution of programs by grade level/audience

Grade Level/Audience	Total
Nursery, Pre-School	38
K—2	135
3—5	207
6—8	268
9—12	295
Community College	27
College/University	35
Teacher Professional Development	120
Family	3

Not surprisingly, an assessment of the grade level and audiences for the bulk of STEM enrichment programs available to the Long Island community are targeted to the 3-12 grade level. What was informative is the apparent lack of family based programming. The family programming data warrants further review and evaluation as parental engagement has been demonstrated to positively influence student performance and interest in STEM fields. The development of family components to programs or new family based programs and activities may be an opportunity for the Long Island community to create an awareness and appreciation of STEM disciplines and of the numerous high tech industries with career opportunities on Long Island.

The data also indicates that a large number of the non-credit bearing STEM programs for student enrichment come from a relatively small subset of organizations that specifically target STEM as a core mission.

Organization Name	Type	# of Programs Offered
Cold Spring Harbor Laboratory	Informal Education	86
Brookhaven National Laboratory	Informal Education	51
Stony Brook University	Higher Education	41
Long Island Science Center	Informal Education	40
Long Island Aquarium	Informal Education	36
Cradle of Aviation Museum	Informal Education	27
Hofstra University	Higher Education	23
Science Museum of Long Island	Informal Education	20
Center for Science Teaching and Learning	Informal Education	14

The chart above indicates that among the nine organizations offering the most programs, approximately 80% are being offered by non-academic based organizations with the remainder being provided primarily through non-credit bearing programs at local universities.

Distribution of STEM disciplines based on the Regional Industry Council categories

As part of the data collection survey, a cursory evaluation was done to assess which area of economic growth in Long Island the program best represented. These areas are referred to as Regional Industry Councils (RIC) established as part of the Long Island STEM Hub. The specific areas included: Health Care and Life Science, Energy and Environment, Engineering, Information Technology, Advanced Manufacturing, Homeland Security, Global Business and Aviation/Aerospace. The distribution of STEM programs across the Regional Industry Council categories shows a cluster around the Healthcare and Life Science category more so than any other. Since the industries on Long Island are so diverse and the workforce required by these industries must be knowledgeable in STEM disciplines, it might be of benefit for industries in the other sectors to support more interns and STEM programs to create broader student career awareness.

Although the survey results are preliminary, they do suggest, that there exists a decided emphasis on programs featuring environmental and life science topics while chemistry, physical sciences, earth sciences, technology, mathematics, and engineering programs are offered less often. The lower number of engineering and mathematics related programs noted earlier suggests that a need may exist for Long Island. This coupled with the realization that only 45% of 15 year olds in the United States born to college educated parents are considered proficient in math[1], and math skills are essential to high tech jobs, should give our region incentive to build stronger formal and informal opportunities in engineering and math for students and teachers.

Data Collection: Looking Forward to Increased Data and Utility

The data collected thus far represents a substantial portion of the STEM enrichment programs available to the Long Island community. However, there is still much work to do including refining the data, breaking it down further to facilitate improved queries, and to increase the completeness to represent an even broader cross section of Long Island STEM enrichment providers including the balance of the K-12 school districts. There also are longer term maintenance and operations expectations to be met. Provided below are areas identified to continue increasing the value and utility of this asset mapping and gap analysis effort.

1. Refine the set of information that will fully represent each STEM related program offered by educational institutions (viz., all public schools, BOCES, and private schools from Kindergarten to Post-doctoral studies), education-related organizations (viz., museums, science centers, etc.), and other enterprises (non-profit and for-profit) for Long Island's Nassau and Suffolk counties.

2. Publish a database that tracks the current information for all STEM related programs on Long Island. This database should employ a regimen of validity checks to ensure the accuracy and completeness of its information. The Connect to Tech database is the first step toward completing this action.

3. Establish a sustainable method for the ongoing collection of timely information for all STEM related programs on Long Island.

4. Establish an internet presence that is recognized as the preferred starting point for seeking out information about Long Island's STEM related programs.

5. Expand the query capabilities of the database to allow multiple keywords.

6. Develop a rating system that provides a feedback mechanism for program quality and ratings. This is desirable given that identifying the existence of a program does not necessarily ensure or communicate the quality of the program.

Summary

Long Island is recognized for the general quality of its academic institutions, the capabilities of its student population, and the breadth and depth of its industry sectors. Indeed, the region seems poised to continue growth of industry into emerging markets based on the strength of our industry capacity, the depth of academic research capabilities within, and the regional government and private support for startup enterprises. Sustainability of the economic engines of Long Island requires a prepared workforce with the essential skills and adaptability to meet industry needs going forward. Clearly, Long Island students are capable of achieving the requisite skills and capabilities for a STEM workforce, but far too few are choosing to do so. As a community we must work together, putting individual needs aside, to develop a strong awareness of well paying STEM based careers on Long Island, to align our academic curriculum with industry needs that inspire students to excel in math and science, and to provide workplace learning opportunities that introduce students and teachers to industry settings.

This report offers several opportunities to improve our regional performance in the noted areas.
Efforts will continue to expand the understanding of STEM programming opportunities on Long Island, to identify areas of need, and to work more cohesively as a community to ensure that our students are college and career ready.

Source:

Source: Levine, Arthur. "The Suburban Education Gap." *The Wall Street Journal*. 2012. http://online.wsj.com/article/SB10000872396390444223104578041181255713360.html

APPENDIX A

i. Description of Survey Contents
    1. The survey's contents collect information that includes the following:
        a. Identifying information
            i. Organization or Institutional affiliation
            ii. Organization Type (Business, Public School, etc.)
            iii. Profit/Not-for-profit status
            iv. Program Contact Information
                1. Contact name
                2. Contact phone
                3. Contact email
            v. Web site location
        b. Program Information
            i. Program name or course title
            ii. Program description
            iii. Period offered
            iv. Time offered
            v. Program cost
            vi. Cost
            vii. Scholarship availability
            viii. Cost waiver
        c. Internship opportunity
            i. Paid, unpaid
        d. Program Audience
            i. General
            ii. Students (K-12, Undergraduate and Graduate)
            iii. Professional Development (Teachers, Professors, Continuing Education, etc)
            iv. Grade level
                1. Nursery / Pre-School
                2. K—12
                3. Undergraduate (Community Colleges)
                4. Undergraduate (Four Year Colleges and Universities)
                5. Graduate
                6. Post Doc
                7. Continuing Education
                8. Family
        e. Program Topic Category
            i. STEM disciplines incorporated in program
            ii. Science, Technology, Engineering, and Mathematics
        f. Regional Industry Council (RIC) topics incorporated
            i. Healthcare and Life Science

ii. Information Technology
iii. Energy and Environment
iv. Aviation
v. Advanced Manufacturing
vi. Engineering
vii. Homeland Security
viii. Global Business

g. Data Auditing Information
i. Row number from Original Excel Spreadsheet
ii. Entered By
iii. Phone
iv. Email

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Long Island Matrix
Science and Technology

BROOKHAVEN
NATIONAL LABORATORY

Long Island
STEM Hub