

2018

**Leadership and iSTEAM for Females in Elementary Schools
(LiFE): An Integrated Approach to Increase the Number of Women
Pursuing Careers in STEM**

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Leadership and iSTEAM for Females in Elementary Schools (LiFE): An Integrated Approach to Increase the Number of Women Pursuing Careers in STEM

Vision

Women earn about 20% of engineering and computing degrees
Need to increase the numbers of women persisting in STEM pathways
LiFE fosters interest, engagement, and collaboration, for women in STEM.
Develop STEM clubs for elementary school girls that leverage:
hands-on, minds on, exploration STEM activities
community inspired grand design challenges
collaborative teams showcasing their solutions at annual event
mentoring by female role models
building communication skills, teamwork, leadership
summer professional development program and more
Create a playbook showing how any educator, anywhere can:
foster broader participation in STEM
form a network backbone to support women to pursue STEM careers
make visible to the many pathways to a successful future in STEM

Partnerships

Diverse set of NJ School Districts:

- **Hillside** – home of the Girls Rock Science Club **LiFE** is built on
- **Morris Plains**
- **Weehawken**

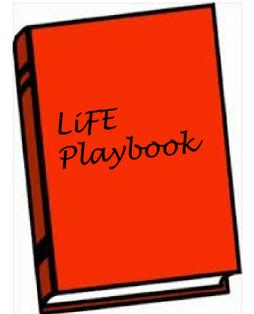
USArmy – leadership, female engagement team, role models, design challenge
Apple - educational technology and software training, professional development
NJIT Affiliated Groups - Murray Center for Women in Technology, Society for Women Engineers, Educational Opportunity Program, Society of Hispanic Engineers, National Society of Black Engineers, the Albert Dorman Honors College, Center for Pre-College Programs and the JerseySTEM education outreach club. Female faculty from departments of Architecture & Design, Biology, Biomedical Engineering, Chemistry, History, Humanities, Math, Physics and Theater and more

Goals/Metrics/Evaluation

Objectives:
 1) Understand the current state of the Girls Rock Science club
 2) Determine from students the types of projects and activities in STEM that interest them
 3) Determine from teachers STEM projects to be offered and resources needed to accomplish effective STEM projects suited to their specific community and situation
Formative and Summative Assessment
 1) Investigate interventions for broader participation of young women with an integrated program of meaningful iSTEAM activities and skillbuilding experiences in a collaborative framework.
 2) Study whether replicating the Girls Science Club concept in districts with various demographics and integrating iSTEAM and skill-building helps girls' interest in STEM to persist.
 3) Determine if continuing the **LiFE Clubs** through grade 6 increases persistence in STEM interest.
Methods: E.g., Standardized test scores, Attitude surveys, Skill development, Activity participation and artifact creation

LiFE

NJIT's Leadership and iSTEAM for Females in Elementary School Program



Leadership/Communication

NJIT serves as collaboration/communication hub to foster shared leadership.
 Consistent and continuous communication among partners, and iterative feedback to make continuous quality improvement in project design
 Partners bring together knowledge, assets and resources to gather and develop materials, and procedures for iSTEAM projects for **LiFE** members
 Each district **LiFE** team develops and customizes girls clubs (recruitment, meeting frequency and timing) to community particulars, share and support
 Bi-monthly Student Teleconference with each other & STEM professionals.
 Partner Quarterly Meetings provide strategic direction, build partnership, discuss process, schedules, successes, needs, and challenges
 Students-teach-students STEAM - Twice annually via video link, club members "teach" students in other clubs about projects, facilitated by NJIT
 Virtual and in-person visits by role models
Prior to LiFE launch Partner meetings/events/ planning accomplished

Expansion, Sustainability, Scale

Project leadership's prior collaborations will promote scale-up
 We have held events with or performed education, digital learning projects

- **NJ School Boards Association** – connections to all NJ districts
- **NJ Department of Education** and **Future Ready Schools-NJ** - connects to hundreds of NJ education leaders
- **New Jersey Black Mayors Alliance for Social Justice** – connections to increase participation of underrepresented minorities
- **Apple and Army**
- Other National Organizations:
 - **Junior Achievement, Latinas in STEM, Lego Education**
- NJIT Faculty, Steering Committee

LiFE Playbook will be created with best practices and directions how to develop all the aspects of **LiFE**, replicate it and customize it for any community

Outcomes? What we've done so far

Goal is to develop the Playbook to replicate **LiFE** in any community with:
 Dedicated elementary school educators, STEM-focused college students and non-profits willing to volunteer, Universities that promote service education, Technology for virtual meetings, Private and public organizations working to promote STEM .
 The playbook will provide best practices, case studies, and mechanisms to customize generic templates and programs on diverse topics for the demographic
Timeline of Events relevant to LiFE since award with PI team involvement:
 9/26/2017 *K-12 Collaboration for Broader Impacts* – spread Life message to NJIT Faculty
 9/29/2017 and 10/11/2017 Leadership Colloquia: *Introduction to goal oriented Distributed Leadership and Personal action plan for leadership and success* -- spread info re: LiFE among NJIT undergrads
 10/18/2017 *STEAM-Art Intersects Science* – HS students visit NJIT re: connections to art from scientists
 10/23-26/2017 NJ School Boards Association Workshop 2017 – participation in STEAM Tank finals
 11/17/2017 *Invest in Yourself: Fellowship, Service, & Mentoring* - women's panel for NJIT undergrads
 12/19/2017 **iSTEAM Day**- 100 fourth graders from **LiFE** schools participate – see comments on side and several pictures on this poster
 3/14/2017 Pi Day -- ~200 students from **LiFE** elementary schools will participate in a day of iSTEAM
 3/23/2017 *Women Designing the Future - The Environment: Doing More with Less* annual NJIT event featuring women professional leaders
 3/27/2017 Cradle to Career Summit – promote K-20 collaboration among educators interested in Future Ready Schools, iSTEAM and the Maker movement

4/1/2018 LIFE BEGINS

Feedback on iSTEAM Day for Elementary School:

"The ... program was a great success. I greatly appreciate your communication, coordination, and support providing our students an incredible learning experience. They had a wonderful time. The students were engaged, enthusiastic, and enjoyed the learning experience. The group facilitators (NJIT staff) were fantastic with the students. Overall, it was a highly effective program." Mark Maire Superintendent, Morris Plains School District

"The **LiFE** activity at NJIT on December 19th was an excellent opportunity for students and staff to engage in hands-on, minds-on problem based learning activities. The mixed grouping of students helped to enhance their level of engagement and the opportunity to make new friends. Led by a facilitator at each station, the activities were relevant, authentic and hooked the students into thinking and doing.

The opportunity to exchange ideas with other educators from across northern NJ was invaluable for my staff. We look forward to implementing the collective best practices documented by the teams." Antoine Gayles Superintendent, Hillside Public Schools

