



GET CITY - Green Energy Technology at the Lansing Boys and Girls Club

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Objectives

GET City will offer two cohorts of Lansing youth from minority and low-income backgrounds a year round science and engineering program that focuses on energy production and sustainability, including green energy technologies, through application of advanced IT skills. The program will provide: **a. Experiences with advanced IT tools;**

- Dpportunities to develop scientific research skills and conceptual understandings related to energy technologies, production and sustainability;
- c. Job skills development for the growing IT market and awareness of and commitment to STEM areas in college and professional life;
- d. Interactions among youth and parents/caregivers around advanced IT and the relationship between green energy technologies and local environmental health; and
- e. A curriculum for informal science and IT education that can be adapted in other urban communities.

GET City will study how a university-community-business partnership program:

- Fosters youth knowledge and skill development in the areas of energy production and sustainability in the urban center;
- Empowers youth in drawing upon IT skills to communicate ideas, to apply understandings to problem solving, and to change personal practices; and
- Fosters greater community awareness and communication around the energy issues that face cities and around STEM trajectories for youth in IT, engineering, and energy production and sustainability

Community Partners: Lansing Board of Water and Light, Urban Options



GET City consists of a set of *six integrated* components, which include: (1) Year-round Program: After School and Summer Fall (36 hours), Spring (60 hours), and Summer Sessions (48 hours) emphasizes unique energy technology themes, including:

Program Design

Year 1: Investigating Current Energy Production, Use, and Implications

Fall: How healthy is Lansing?: Students investigate and model the relationship between energy use and the health of the urban environment through a case study of urban heat islands.



Spring: Brownouts in your neighborhood: Is this Lansing's future?: Students investigate and model where and how Lansing area energy is produced, how it is distributed and used, and the implications of overuse (i.e., energy consumption patterns from supply and demand perspectives).

Summer: Taking Action!: Students conduct energy audits and use findings to design efficient urban energy practices.

Year 2: Investigating Future Energy Production, Use and Implications Fall (9 week session): Surviving the Michigan Winter with Solar Energy! During this unit, students will investigate solar energy in the context of a novel solar powered worm bin, and will extend their investigations into wind and biomass energy and their application in the Lansing region.

Spring: 21st Century Energy. Students investigate the need for alternative energy, strategies for low-impact utilization of fossil fuels, replacement of fossil fuels with renewables- wind, solar, hydrogen, and biofuels. Summer: Taking Action, Part II: Students design for Green Energy Technologies in the City, learning about fuel cells for transportation and home-based power.

(2) Connecting Youth with Careers: Energy Mentors, Role Models and College Preparation. In addition to weekly interactions with the PIs, youth are supported in GET City by Energy/IT [EIT] Mentors. EIT Mentors work with small teams of youth during scheduled activities and hold mentoring sessions to discuss career awareness and the high school and college transition. EIT mentors include undergraduate engineering majors and engineers, energy scientists and technicians from in and around Lansing.

(3) Community Energy Events. GET City holds two community energy events each year at various Lansing locations, allowing youth to showcase their research findings and to engage community participants in energy and IT activities.

(4) Parental Involvement. GET City offers IT/Energy related workshop for parents, and supports parents in participating in GET City during the year-round programs.

(5) Student-developed and maintained website. Youth design and maintain the GET City website's three areas: (1) providing energy and sustainability information to the Lansing community; (2) sharing GET City data findings, and (3) interaction components, including on-line energy use survey and a weblog.

(6) Youth Leaders. In year three, approximately 5-10 GET City "graduates" will be selected to participate as youth leaders. Selection will be based on successful completion of GET City, recommendations by EIT Mentors, and strong IT and interpersonal skills.

Research Design

Artifacts

Program



Research into

student growth

as technology

empowered

scientists/

engineers

(MSU)

- To what extent was GET City implemented successfully each year and over time? What adaptations occurred? What factors supported and impeded implementation?
- In what ways do participating students grow in their knowledge and confidence of advanced IT?
 To what extent do participating
 - and confidence of advanced IT?
 To what extent do participating students exhibit interest in pursuing careers related to science and technology?
 - What forms of knowledge formation, identity formation, discourse, and empowerment accompany youth's growt as technology empowered scientists and engineers?
 - How do youth identify as and with scientists and engineers over their two year participation in GET City?
 - What other forms of deep engagement with science/engineering and IT do students exhibit over their two year experience?

instrument	Participants involved	Type of Data	Measurement
Interviews	Program Staff	Qualitative	Program awareness, recruitment procedures, facilities, logistics, scheduling, training & communication
Surveys	Participating Students	Quantitative	Knowledge of technology use, aspirations for IT careers, level of engagement in Get city, career intentions
Focus Groups	Participating Students	Qualitative	Experiences in program (I.e. conflict with other scheduled activities, technology resources at home, frequency and duration of program), parental involvement
Secondary Data	Participating Students	Quantitative	Attendance at program activities
	Energy Mentors	Quantitative	Frequency of interaction with students
	Participants' parents	Quantitative	Frequency of involvement
	Program	Qualitative	Documents/artifacts representing program milestones or key implementation activities
Data and leating	Destinizants involved	Turne of Data	Management
instrument	Participants involved	Type of Data	Measurement
Program documentation	Program Staff	Qualitative	Recruitment activities and "yield", enrolled participants, program delivery, staffing, participant attendance, other program events & milestones (community energy events, publications/conference presentations)
Pre/Post test	Participating Students	Quantitative	Knowledge of science & technology covered in Get city
Interviews	Participating Students	Qualitative	Knowledge of science & technology, aspirations for SMT related careers, identity & community connections, experiences in the program
Fieldnotes	Participating Students	Qualitative	Forms of participation at program activities Forms of participation, frequency of involvement

Qualitative

Documents/artifacts representing program milestones or key implementation activities