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B'More Engaged Youth Leadership Program: Empowering at-risk youth with 21st century skills to use public health data to improve food security

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Abstract

Top-down policymaking approaches (expert-driven, excluding the end-user in the process) for at-risk youth in Baltimore City is one reason for the underuse of government-funded programs, i.e. the Summer Meals program which provides free food to youth workers.

This is an unfortunate missed opportunity: more than 42% of West Baltimore youth live in poverty and within a 'food desert.' One method for improving this top-down approach, especially in the public health sector, is to include the end-user (i.e. youth) on teams with public health scientists and policymakers to co-create evidence-informed policies. While there is an interest in Baltimore City to do this, there remains little guidance for success.

To fill this need, we describe a novel curriculum and research strategy, B'More Engaged Youth Leadership Program, on the competencies needed for at-risk youth, public health scientists, and policymakers to form collaborative, policymaking teams. This course focuses on developing '21st century skills,' such as adapting to change, working in diverse groups, interacting professionally with others, communicating effectively, and managing time and goals. By the end of the course, the youth will co-create an evidence-informed policy recommendation with scientists and policymakers.

The initial pilot study will enroll youth from *The Food Project*, an afterschool non-profit that provides nutrition- and skills-based programming as well as access to healthy foods. To best align with *The Food Project*, the pilot study curriculum and project focuses on food security in West Baltimore.

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In parallel, an exploratory case study will describe the experiences of the co-creation team using a series of strategies (observation, surveys, and interviews) and document activity engagement, 21st century skill development, and the best teaching practices for this team. The outcomes of this program will provide valuable insights into 21st century skill development, what activities are effective for this at-risk group in West Baltimore. This information could be of great value in restructuring future youth civic and science engagement programming in West Baltimore and similar communities around the globe.

Keywords: STEM education, science engagement, civic engagement, curriculum, teaching-as-research, SoTL, active learning, at-risk youth, underserved

Background and Rationale

One in four Baltimore residents live in a food desert or a 'healthy food priority area,' which are neighborhoods that have a poor ranking in food store quality, a low median income, more than 30 percent of households without cars, and are more than a quarter-mile from a supermarket.^{1,2} The poorest neighborhood in Maryland, in the Baltimore City ZIP Code 21223, is 37% food desert.³

This neighborhood also has the highest rate of childhood poverty with 42.3% of households in poverty. Additionally, 32% of this population live in ALICE levels (Access Limited, Income Constrained, Employed) of poverty.^{3,4} High unemployment, low rates of high school completion, high crime, and drug abuse are chronic problems that create barriers for residents.³ Many youth are struggling to survive and, as a result, are drawn into crime. In 2015, 1,285 juveniles in Baltimore were incarcerated, costing youth opportunities for success and health.³ Baltimore youth have limited opportunities to break out of these unhealthy behavioral patterns.⁴

Civic engagement can be political or non-political in nature and involves, "working to

make a difference in the community and developing the combination of knowledge, skills, values and motivation to make that difference."⁵ The limited literature on at-risk youth and civic engagement has shown that youth from lower socioeconomic backgrounds have the greatest benefit from participation in the policymaking process,⁶ but are also less likely to have access to these opportunities.⁷⁻⁹ The most important benefits for at-risk youth is a 'sense of empowerment that opposes the unfortunately common experiences with marginalization and alienation because of systemic racism and oppression.'^{10,11} Empowerment comes from the opportunity to show strengths while solving community problems, a sense of leadership, ownership, and connection to peers.¹²⁻¹⁴ Participating in these activities also limits free time for youth to be involved in risky behavior, connects youth to mentors, and provides opportunities for healthy relationships with peers.^{8,15-17} The potential positive effects of civic engagement for at-risk youth make it critical to understand how to roll-out a successful curriculum amongst this population.

Teaching civic engagement to young people has generally been well-published and there

is a wealth of online instructor resources to shape curriculums. For example, the 'Something is Wrong: Exploring the Roots of Youth Violence' and Loyola University's course manual, "Civic Engagement with CeaseFire and Peace Circles" provide in-depth instructor manuals, background materials, and activities.^{18,19} They have provided the resources to adapt these courses to other settings. Related fields, like service-learning and social justice, have also produced online curriculums and resources that are excellent sources of instructor guidance.^{20,21}

Despite their excellent source material, these curriculums are not supported by rigorous "teaching-as-research" with formalized assessment of methods, outcomes, and instruments. Also missing is an explicit focus on strategies that work best to teach at-risk youth, like those in West Baltimore. Only a limited number of studies have examined the effects of civic engagement among youth of color and low-income youth; current findings are mainly based on research with samples of working- and middle-class white youth.^{7,15,22–26}

To fill this gap, the B'More Engaged Youth Leadership Program includes a case study research component with open access to a case study protocol, assessment instruments, measurable outcomes, and instructor manual. The goals of running this program are therefore twofold: (1) to teach at-risk youth how to use public health data to advocate to policymakers to improve food security in their neighborhood and (2) to investigate and report on several teaching-as-research questions, including an evaluation of proposed assessment instruments, outcomes, and a description of the co-creation process.

The Development of the B'More Engaged Youth Leadership Program

The Program

In a new partnership between at-risk youth, community leaders, Johns Hopkins University scientists, and Baltimore City policymakers, the new B'More Engaged Youth Leadership Program aims to provide new opportunities for youth to break out of unhealthy patterns through civic and science engagement in a co-creative process.

Program participants will include a total of 24 students across three course sections, 8 youth instructors, and 10 public health professionals as guest instructors. For this pilot study, sample size was based on informal focus group sessions with youth and instructors of *The Food Project* regarding pilot course feasibility and the best student-instructor ratio. This focus group determined that the pilot study should consist of three iterations of the course (A, B, C) over the span of two rounds. Round 1 implementation of the course will include the first iteration of the course (A) and will be comprised of 8 students and 2 adult instructors. Round 2 of course implementation will include both iterations B and C. Each of these will also be comprised of 8 students and 4 youth instructors (for a total of 16 students and 8 youth instructors). Again, the youth and instructors in the community decided upon these numbers in a focus group based on their extensive experiences and knowledge of the youth.

The goal of the B'More Engaged Youth Leadership Program is to implement a combined civic and science engagement curriculum that empowers at-risk youth with the 21st century skills (adapting to change, collaboration, communications, time and

goal management)^{27–34} while they collaborate with public health scientists and policymakers on projects that advocate for better food security in their neighborhood. The course objectives are:

1. Teach students about community, its assets and failures, and how to promote positive change.
2. Inform students about the root causes of food insecurity, and where to find related information from scientific and reliable sources.
3. Provide structure for students to participate in an action research project that will lead to the generation of policy recommendations to improve food security

To ensure that this work is youth- and community-driven, partners on this program and research include: Michelle Suazo, Executive Director of The Food Project, an afterschool program in West Baltimore that provides healthy foods and life skills classes for at-risk youth; Joni Holifield, Executive Director of Uplifting Our Youth, Inc., a youth leadership and professional development program in Baltimore; Nina M. Martin, PhD, Assistant Scientist at Johns Hopkins School of Public Health, who does research on science communication and civic engagement; Holly Freishtat, CN, MS Director of Food Policy Initiative in Baltimore City Office of Planning; and Alice Huang, leader of Baltimore's Food Policy Action Coalition and Baltimore City Office of Planning. With this foundational group of partners from the community, policymaking, and science, we will ensure the youth will have a strong base with whom they can co-create and collaborate.

Program Outcomes: Focus on 21st century skills

While the program focuses on civic engagement around food security for the community, the framework for curriculum co-creation, implementation, and assessment should ensure that the learning outcomes from this curriculum are applicable to other settings. The student learning outcomes are based on the 21st century skills framework, which includes a total of 26 essential skills from the official Organization for Economic Cooperation and Development (OECD) list^{29,35}). The term “*21st century skills*” refers to ‘a broad set of knowledge, skills, work habits, and character traits that are believed to be critically important to success in today’s world.’ These skills align with this curriculum, as they are highly applicable to all educational, career, and civic settings throughout a student’s life. These skills are divided into three areas: 1) learning and innovation skills (creativity, critical thinking, communication and collaboration), 2) information, media and technology skills (range of functional and critical thinking skills related to information, media and technology), and 3) life and career skills (adapting to change, professionalism, emotional intelligence, time and goal management).

Within the context of this curriculum, four priority skills were selected for this group to develop, based on a survey of twenty youth, two researchers, two policymakers, and four community leaders. Participants ranked the 21st century skills in order of importance for youth to learn to successfully complete a civic engagement action research project and to successfully instruct the course. There was high agreement that life and career skills were ranked as the highest priority,

followed by learning and innovation skills, and information, media and technology skills ranked as the lowest priority. Figure 2 shows a heat map of how participants ranked the 26 skills, plus additional outcomes related to course content. Participants ranked the following 21st century skills the highest: adapt to change, interact professionally with others, communicate effectively, and manage time and goals.

The researchers added in outcomes for valuing civic engagement and conducting civic engagement projects that use public health data to improve the well-being of the community and action research. These skills are of great importance in the context of public and community health: a balanced diet is not just about access to foods, but also empowering individuals (youth) with the assets, agency, contribution, and enabling environment to be able to make healthy, long-term decisions.^{24,36–39}

The participant-identified outcomes are mid- to higher order learning outcomes on Bloom's Taxonomy. To ensure that students make progress towards these goals, scaffolded outcomes (lower order level outcomes) have been selected as steppingstones towards the overall goals. We do not expect students to master these outcomes or skills by the end of the first course.

Pedagogical Curriculum

The B'More Engaged Program is rooted in previously existing curriculums that teach civic engagement and social justice to undergraduates—but has been modified in a number of ways to rigorously assess and document the learning process for at-risk youth in this context. The backbone of the

curriculum (i.e. the three major units, see Table 1) was adapted from two main sources: Loyola University's course manual, "Civic Engagement with CeaseFire and Peace Circles" and 'Something is Wrong: Exploring the Roots of Youth Violence.'^{18,19} This backbone is in alignment with community-identified themes and also features a six-week action research project.

Changes to above curriculum include: (1) *Topic change*. The course was changed to feature food security instead of violence, as this is what the target population selected as the topic. (2) *Defined student learning outcomes*. The reviewed civic engagement and social justice curriculums do not seem to incorporate measurable student learning outcomes.^{18,20,21,41} The 21st century framework provides specific and measurable indicators of success as well as scaffolded lower-level outcomes. (3) *Use of validated and open access assessments*. Other curriculums do not have a rigorous and published approach to assessing student learning outcomes. This curriculum employs internationally validated assessment instruments (see Table 3). (4) *Refined Focus of Activities*. The basic model has also been adapted to have a specific focus on science engagement and specific collaborations with scientists and public health science policymakers. (5) *Guest instructors*. Ten public health professionals (including scientists, policymakers, and food security advocates) will facilitate specific class activities related to their field of expertise. For example, a public health expert in survey design and qualitative methods will facilitate the related class. (6) *Rigorous scientific research*. This course is also the subject of an exploratory case study (performed by Dr. Nina Martin) to describe and document what is working versus not working to teach

at-risk youth how to collaborate on co-creation teams of youth, policymakers, and scientists.

Teaching-As-Research: Case Study Protocol, Planned Data Collection, and Assessment

The major goals of this teaching-as-research are to provide an in-depth description and analysis of the skills, outcomes, and activities that are important for this group of at-risk youth. It will allow them to learn how to contribute positively and productively to the well-being of the community and interact capably with Baltimore public health professionals. The teaching-as-research questions are:

1. How do student-led civic engagement projects impact students' ability to: adapt to change, work productively with others in diverse groups, communicate effectively, and manage time & goals?
2. Will the civic engagement curriculum need to be adjusted to accommodate at-risk youth? If so, how?
3. What are the experiences of [students, policymakers, public health scientists] in a student-led civic engagement training/action research project?
4. What are the process and model for success for co-creating youth-led civic engagement projects?
5. What are the experiences of the research team with using observational assessments to measure 21st century skill development in at-risk youth?

To answer these questions, a case study research approach will be employed to answer the research questions and provide

rich data on the process and model for success for co-creating youth-led civic engagement projects as well as experiences of stakeholders (Figure 3).

The case study will involve collecting data from a variety of perspectives (collaborators, stakeholders, youth, community, research team) through interviews, focus groups, observation, and surveys. This will describe in detail the co-creation process through observations of the environment and participants, focus groups with the youth participants, a review of literature, and interviews with stakeholders, participants, or key informants. Pre- and post-surveys of students' self-described learning gains will also be included.

This variety of instruments are included because written and/or direct assessment of these at-risk is not sufficient to track 21st century skill development due to poor writing and reading comprehension, and the youth may not possess the self-reflective skills to understand and correctly respond to standardized methods of assessment (i.e. OECD-type assessments). These data will give us the evidence by reflecting the experiences and perceptions of three stakeholders: the youth themselves, the public health professional collaborators, and the research team. We also ensure that we collect supporting evidence from different types of studies (observation, survey, focus groups, interview) to support the different perspectives.

Seven assessment instruments have been adapted from extensively validated and used instruments and/or designed for this study to evaluate achievement of outcomes, development of skills, and to detail the

experiences and processes involved (Table 2).

To increase the reliability of the case study and results attained and to ensure applicability to future studies, a case study protocol was developed. As described in Yin (2013),⁴² the case study protocol includes: an overview of the case study project, field procedures, case study questions, and a guide for the case study report.

Additionally, the data will be organized via a case study database to ensure easy retrieval of data by the investigators and the public, prevention of data loss, and maintenance of an evidence chain. The database will include notes, documents, tabular materials, and narratives. This database is separate from the case study report and will represent all of the raw data (some of which may not be included in the final report).

To further increase the reliability of information presented in this case study, the study team will maintain a chain of evidence that clearly follows the derivation of any evidence, ranging from the initial research questions to the ultimate case study conclusions. Yin⁴² instructs that the evidence chain is made by frequent citation of the aforementioned case study database and particular pieces of evidence. This means that the database must include the evidence in addition to the circumstances in which it was collected (i.e. time and place). These circumstances should be in line with the protocols described in the case study protocol. To finish the chain, a reading of the protocol should show a link between the protocol content and the initial study questions.

Discussion

During the writing of this manuscript, the coronavirus 2019 (COVID19) pandemic has forced after school programs to cease and/or find alternative solutions. These changes impact at-risk youth the most as they may not have access to internet, computers, and other resources needed to learn—as well as the agency to acquire new technological skills to adapt to virtual instruction. The major desired learning outcomes of the B'More Engaged Program (adapt to change, collaborate professionally, communicate effectively, and manage time/goals) are even more important during the COVID19 outbreak. In response, the program has quickly adapted to an online platform via Slack and video conferencing on Zoom. Donations were received to outfit each student with a laptop to stay connected to peers and complete assignments.

More generally, this curriculum and accompanying research aim to provide a framework for teaching and assessing competencies needed for successful co-creation of evidence-informed policies. The policy projects produced by this program will be used, for example, to improve usage of government-funded programs, i.e. Baltimore City Summer Meals. The exploratory case study will describe the experiences of the co-creation team using a series of strategies (observation, surveys, and interviews) and document activity engagement, 21st century skill development, and the best teaching practices for this team. The outcomes of this program will provide valuable insights into 21st century skill development, which strategies work, and which do not work for this at-risk group in West Baltimore. This information could be of great value in restructuring future youth civic and science engagement programming in West

Baltimore and similar communities around the United States and the world.

Constraints and Limitations

The pilot nature of this course and research study limit youth participants to a total of 24 over the study period. This is not enough to propose causal relationships or to validate the assessment instruments in this setting. To address these limitations, the case study design was chosen to show both preliminary proof of concept and to document experiences in the course. This will strengthen phase two of course implementation, which will include expansion to other sites in Baltimore as well as 1-2 partnering institutions in other cities.

Because the principal investigator has had prior interactions with the study population, the study team has thought deeply about how to limit bias and promote scientific rigor. The study team wants the results to embody trustworthiness, auditability, credibility, and transferability through different strategies that include ensuring the quality of data, reflexivity, and dependability of outcomes. Multiple strategies for achieving scientific rigor to overcome potential bias have been designed: (1) co-creation of a case study protocol with the community and study team, (2) use of internationally validated instruments, (3) triangulation and collection of data from multiple perspectives and formats, (4) purposeful selection of aims, (5) transparency of relationships, and (6) plans for external evaluation in future studies.

The case study protocol aims to define the standard operating procedures and policies used in this study. The study team will apply and adapt this protocol to future studies, and it is the aspiration of the team that this

case study protocol will be further adapted by other investigators wishing to do research in similar settings. We have designed this case study exactly as directed in, "Case Study Research: Design and Methods" by Robert Yin. Additionally, the case study protocol has been reviewed by the Johns Hopkins Center for Educational Resources.

We have also limited bias by the way the instruments were selected and designed. All instrument questions were drawn from validated studies and not generated by the investigator team. For example, the SALG (Student Assessment of their Learning Gains) Instrument is an internationally validated instrument that has pre-made questions. This ensures that the investigator's bias is left out of the questions being asked. The COPUS tool is also an internationally validated tool. The student investigator will be using this observation tool; he has no conflict of interest with the study population. Any bias from the investigator has been limited in the new '21st century skills' observation protocol by focusing on observable traits with a yes/no response (i.e. are the students displaying this trait, yes or no?") with detailed definitions of each trait.

Another way that bias is limited is by collecting data from multiple perspectives – the students, the instructors, the stakeholders, the collaborators, and the study team. The data will also be collected in a variety of formats—observation, survey, focus group, and interview to overcome the inherent bias of each method individually.

The other important factor to consider that limits unconscious bias is the nature and purpose of this research. The primary goal of this research is not to demonstrate program success. We aim to provide an in-depth

description of the competencies the students, scientists, and policymakers need to build in order to collaborate and use data to inform policy. This aim will be accomplished by an in-depth description of these traits, and not to show program success. This research is crucial as this is a highly neglected population, and there are no studies describing specific skills, challenges, and opportunities for civic engagement in this group. It will be very beneficial to describe the challenges and opportunities for engagement with these youth in collaborations that can benefit Baltimore – this will help direct future investment into teaching this population how to get involved positively in their community.

In light of circumstances out of the control of the class coordinators, such as the social distancing precautions taken during the COVID19 outbreak, special considerations may have to be made to conduct the class through an online format. For example, during the COVID19 outbreak, the first two units have been switched to live, online classroom discussions where each student, guest, and teacher participates remotely through video. While observations and the instruments designed for the course should be able to function more or less the same, some constraints may be the lack of “normal” group dynamics, lack of student access to the appropriate technology especially in communities like West Baltimore, and the potential privacy and anonymity failings of virtual classrooms. We’ve addressed some of these limitations by providing each student with a laptop, internet access, and video instruction.

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References

1. Duncan I. Baltimore rebrands its food deserts: Now they’re “healthy food priority areas.” Baltimore Sun. <https://www.baltimoresun.com/maryland/baltimore-city/bs-md-ci-food-desert-rebrand-20180117-story.html>. Published 2018. Accessed July 18, 2019.
2. Pugh CE, Wen LS. *Community Health Assessment Baltimore City*.; 2017. <http://health.baltimorecity.gov/>. Accessed April 9, 2019.
3. United Way. ALICE Report. <https://www.unitedforalice.org/national-comparison>. Published 2016. Accessed April 9, 2019.
4. Maryland Department of Health and Mental Hygiene. Hispanics in Maryland: Health Data and Resources. 2013:1-17. <https://health.maryland.gov/mhhd/Documents/Maryland-Hispanic-Health-Disparity-Data.pdf%5Cnhttp://dhmh.maryland.gov/mhhd/Documents/Maryland-Hispanic-Health-Disparity-Data.pdf>.
5. Civic Engagement | Youth.gov. <https://youth.gov/youth-topics/civic-engagement-and-volunteering>. Accessed March 3, 2020.
6. Marsh HW, Kleitman S. Extracurricular school activities: The good, the bad, and the nonlinear. *Harv Educ Rev*. 2002;72(4):464-514. doi:10.17763/haer.72.4.051388703v7v7736
7. Hart D, Atkins R. Civic Competence in Urban Youth. *Appl Dev Sci*. 2002;6(4):227-236. doi:10.1207/S1532480XADS0604_10
8. Chan WY, Ou SR, Reynolds AJ. Adolescent Civic Engagement and Adult Outcomes: An Examination Among Urban Racial Minorities. *J Youth Adolesc*. 2014;43(11):1829-1843. doi:10.1007/s10964-014-0136-5
9. Mahoney J, Larson R, Eccles J. *Organized Activities as Contexts of Development: Extracurricular Activities, after School and Community Programs*.; 2005.

- https://books.google.com/books?hl=en&lr=&id=OE54AgAAQBAJ&oi=fnd&pg=PP1&ots=Lg6-Ht-j2i&sig=Q3O9Q7O0bBwF5mbr7dADdc_obhg. Accessed November 3, 2019.
10. Grollman EA. Multiple Forms of Perceived Discrimination and Health among Adolescents and Young Adults. *Artic J Heal Soc Behav*. 2012. doi:10.1177/0022146512444289
 11. Yeh CJ, Atkins M. Poverty, Loss, and Resilience: The Story of Chinese Immigrant Youth Help Seeking Attitude and Behavior among Youth and Young Adults View project Academic/Career Development and Cultural Adjustment among Ethnic Minority or Immigrant Children and Youth View project. *Artic J Couns Psychol*. 2008. doi:10.1037/0022-0167.55.1.34
 12. Watts RJ, Flanagan C. Pushing the envelope on youth civic engagement: A developmental and liberation psychology perspective. *J Community Psychol*. 2007;35(6):779-792. doi:10.1002/jcop.20178
 13. Gullan RL. Empowering youth to change their world : evaluating the effectiveness of a service program to increase positive development. 2006. doi:10.1016/j.jsp.2006.06.001
 14. Camino L, Zeldin S. From periphery to center: Pathways for youth civic engagement in the day-to-day life of communities. *Appl Dev Sci*. 2002;6(4):213-220. doi:10.1207/S1532480XADS0604_8
 15. Fredricks JA, Eccles JS. Breadth of Extracurricular Participation and Adolescent Adjustment Among African-American and European-American Youth. *J Res Adolesc*. 2010;20(2):307-333. doi:10.1111/j.1532-7795.2009.00627.x
 16. America After 3pm. Afterschool Alliance. <http://www.afterschoolalliance.org/AA3PM.cfm>. Published 2016.
 17. Tanner C. *Reducing Youth Violence: The Role of Afterschool Programs* ABSTRACT *Reducing Youth Violence: The Role of Afterschool Programs*. Vol 8.; 2015. https://scholarworks.gsu.edu/iph_capstone. Accessed October 4, 2019.
 18. Richards M. Civic Engagement Curriculum with CeaseFire and Peace Circles. 2013. https://www.luc.edu/media/lucedu/psychology/pdfs/CEC_Ceasefire_peace_circles_manual.doc.
 19. Kaba M, Mathew JC, Haines N. *Something IS Wrong: Exploring the Roots of Youth Violence*.
 20. *Service Learning Curriculum Development Resource Guide for Faculty*.; 2010. www.csulb.edu/cce. Accessed November 4, 2019.
 21. Service Learning. California State University Monterey Bay. <https://csumb.edu/catalog/service-learning>. Published 2019. Accessed August 22, 2019.
 22. Chan WY. An exploration of Asian American college students' civic engagement. *Artic Asian Am J Psychol*. 2011. doi:10.1037/a0024675
 23. Gaventa J, Barrett G. Mapping the Outcomes of Citizen Engagement. doi:10.1016/j.worlddev.2012.05.014
 24. Fredricks JA, Eccles JS. Is Extracurricular Participation Associated With Beneficial Outcomes? Concurrent and Longitudinal Relations. 2006. doi:10.1037/0012-1649.42.4.698
 25. Flanagan C, Christens B. *Youth Civic Development: Work at the Cutting Edge: New Directions for Child and Adolescent Development, Number 134*.; 2011. https://books.google.com/books?hl=en&lr=&id=_gXBBQ4m-hcC&oi=fnd&pg=PT7&ots=2NBclTfZyo&sig=BMKE84JeP1wvTD_HakBb991ZTNw. Accessed November 3, 2019.
 26. Youniss J, Levine P. Engaging young people in civic life. 2009. <https://philpapers.org/rec/YOUEYP>. Accessed November 3, 2019.
 27. 21st Century Skills Assessment | STELAR - STEM Learning and Research Center. <http://stellar.edc.org/instruments/21st-century-skills-assessment>. Accessed January 28, 2020.
 28. *Exploring the Intersection of Science Education and 21st Century Skills*. Washington, D.C.: National Academies Press; 2010. doi:10.17226/12771
 29. Ananiadou K, Claro M. 21st Century Skills and Competences for New Millennium Learners in OECD Countries DIRECTORATE FOR EDUCATION 21ST CENTURY SKILLS AND COMPETENCES FOR NEW MILLENNIUM LEARNERS IN OECD COUNTRIES EDU Working paper no. 41. 2009. doi:10.1787/218525261154
 30. Binkley M, Erstad O, Herman J, et al. Defining twenty-first century skills. In: *Assessment and Teaching of 21st Century Skills*. Springer

- Netherlands; 2014:17-66. doi:10.1007/978-94-007-2324-5_2
31. Ercikan K, Elena Oliveri M. Applied Measurement in Education In Search of Validity Evidence in Support of the Interpretation and Use of Assessments of Complex Constructs: Discussion of Research on Assessing 21st Century Skills. *Appl Meas Educ*. 2016;29(4):310-318. doi:10.1080/08957347.2016.1209210
 32. Geisinger KF. 21st Century Skills: What Are They and How Do We Assess Them? *Appl Meas Educ*. 2016;29(4):245-249. doi:10.1080/08957347.2016.1209207
 33. Lai ER, Viering M. *Assessing 21st Century Skills: Integrating Research Findings*.; 2012.
 34. Ruiz-Primo MA. *Towards a Framework for Assessing 21st Century Science Skills*.; 2009.
 35. OECD. *PISA 2015*.; 2018. <http://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf>. Accessed August 8, 2018.
 36. Durlak JA, Weissberg RP, Pachan M. A Meta-Analysis of After-School Programs That Seek to Promote Personal and Social Skills in Children and Adolescents. doi:10.1007/s10464-010-9300-6
 37. Lerner RM, Dowling EM, Anderson PM. Positive Youth Development: Thriving as the Basis of Personhood and Civil Society. *Appl Dev Sci*. 2003;7(3):172-180. doi:10.1207/S1532480XADS0703_8
 38. Cargo M, Grams GD, Ottoson JM, Ward P, Green LW. *Empowerment as Fostering Positive Youth Development and Citizenship*.
 39. Hinson, L., Kapungu, C., Jessee, C., Skinner, M. B, M. & Evans-Whipp T. *Positive Youth Development*. Washington, D.C.; 2016. [https://static.globalinnovationexchange.org/s3fs-public/asset/document/PYD Measurement Toolkit Final.pdf?FmETOPj.28pXhWjfwDXARknamnNBVg_r](https://static.globalinnovationexchange.org/s3fs-public/asset/document/PYD%20Measurement%20Toolkit%20Final.pdf?FmETOPj.28pXhWjfwDXARknamnNBVg_r).
 40. P21 Network. *21st Century Student Outcomes & Framework Definitions*.
 41. Richards M, Romero E, Deane K, et al. Civic Engagement Curriculum: a Strengths-Based Intervention Serving African American Youth in a Context of Toxic Stress. *J Child Adolesc Trauma*. 2016;9(1):81-93. doi:10.1007/s40653-015-0062-z
 42. Yin RK. *Case Study Research: Design and Methods (Applied Social Research Methods)*. 5th ed. London: SAGE Publications, Inc; 2013.
 43. Northern Arizona University. *Professionalism Assessment Rubric*.; 2018.
 44. GORP - Generalized Observation and Reflection Platform. <https://gorp.ucdavis.edu/>. Accessed January 28, 2020.
 45. Smith MK, Jones FHM, Gilbert SL, Wieman CE. The classroom observation protocol for undergraduate stem (COPUS): A new instrument to characterize university STEM classroom practices. *CBE Life Sci Educ*. 2013;12(4):618-627. doi:10.1187/cbe.13-08-0154
 46. Martin AJ, Nejad HG, Colmar S, Liem GAD. Adaptability: How students' responses to uncertainty and novelty predict their academic and non-academic outcomes. *J Educ Psychol*. 2013;105(3):728-746. doi:10.1037/a0032794
 47. Falchikov N, Boud D. Student Self-Assessment in Higher Education: A Meta-Analysis. *Rev Educ Res*. 1989;59(4):395-430. doi:10.3102/00346543059004395
 48. Seymour E, Wiese DJ, Hunter A-B, Daffinrud SM. *Creating a Better Mousetrap: On-Line Student Assessment of Their Learning Gains*. <http://www.wcer.wisc.edu/salgains/instructor>. Accessed January 28, 2020.
 49. SALG - Student Assessment of their Learning Gains. <https://salgsite.net/about>. Published 2000. Accessed January 28, 2020.
 50. Student Peer Assessment | UNSW Teaching Staff Gateway. <https://teaching.unsw.edu.au/peer-assessment>. Accessed January 28, 2020.
 51. Yang H-H. *Constructing a Rubrics of Peer Assessment Applied on Online Course in 2D Animation Production*. www.iafor.org. Accessed January 28, 2020.
 52. Atkins R, Hart D. Neighborhoods, Adults, and the Development of Civic Identity in Urban Youth. *Appl Dev Sci*. 2003;7(3):156-164. doi:10.1207/S1532480XADS0703_6
 53. Kirshner B, Strobel K, Fernández M. *Critical Civic Engagement Among Urban Youth*. Vol 1.; 2003. www.urbanedjournal.org.
 54. Smetana JG, Metzger A. Family and Religious Antecedents of Civic Involvement In Middle Class African American Late Adolescents. *J Res Adolesc*. 2005;15(3):325-352. doi:10.1111/j.1532-7795.2005.00099.x
 55. Torney-Purta J, Barber CH, Wilkenfeld B, Barber CH, Wilkenfeld B. Latino Adolescents' Civic

Development in the United States: Research Results from the IEA Civic Education Study. *J Youth Adolesc.* 2007;36:111-125. doi:10.1007/s10964-006-9121-y

56. Chan WY, Ou SR, Reynolds AJ. Adolescent Civic Engagement and Adult Outcomes: An Examination Among Urban Racial Minorities. *J Youth Adolesc.* 2014;43(11):1829-1843. doi:10.1007/s10964-014-0136-5

Figures & Tables

Figure 1 Teaching youth civic and science engagement via the B'More Engaged Youth Leadership Program (website: www.bmore-engaged.org)

Figure 2 Identification of high priority (green) 21st century outcomes by participants.
Outcomes taken from ^{29,40}

Life and Work Skills	Learning and Innovation	Information, Media and Technology
Manage Goals and Time	Communicate Clearly	Adapt to Change
Interact Effectively With Others	Reason Effectively	Use and Mange Information
Work Effectively on Diverse Teams	Solve Problems	Access & Evaluate Information
Value Community Service	Work Creatively with Others	Apply Technology Effectively
Contextualize Community	Use Systems Thinking	Be Flexible
Be responsible to others	Make Judgements and Decisions	Analyze Media
Be Self Directed Learners	Collaborate with Others	Create Media Products
Identify Community Assets	Define Basic Concepts
Work Independently	Explain Importance of Food Security	
Produce Results	Identify Food Security Resources	
Describe Community	Implement Innovations	
Manage Products	Define Food Security Solutions & Challenges	
	Visualize Food Security v Insecurity	

Figure 3 Case Study Design adapted from Robert Yin's Case Study Research Design & Methods⁴²

Table 1: B'More Engaged Youth Leadership Program Curriculum

Unit 1: Introduction to Community			
Objective: Students learn about the meaning of community, its assets and failures, and how to promote positive change			
Class Topic	Objectives	Desired Outcomes	Activities
What is civic engagement & community?	Students will be able to define community & its relation to civic engagement.	Define community Understand the relationship between community, civic engagement, democracy, and diversity	Discussions on community, civic engagement, democracy, diversity. Rules discussion.
African American Science Leaders	To have participants understand how African American science leaders create change and how they can apply these lessons in their own lives.	Tell a story about an admired leader Articulate characteristics of leaders	Guest facilitator: Dr. Stan Andrisse, CEO of <i>Prison Cells to PhD</i> Discussions on leaders and characteristics of leadership qualities and how students can incorporate that into their own lives.
Asset Mapping Our Community I	1. Identify main idea in <i>Assets Mapping</i> article	Define community assets and issues	Group reading of article Asset Mapping. Using handout, generate the main idea list of the article.
Asset Mapping Our Community II	1. Identify assets & issues in the community	Photograph assets and issues	Tour of community and photo journaling.

Asset Mapping Our Community III	1. Construct the class map 2. Hypothesize and see examples of an ideal community	Think critically Communicate effectively Adapt to change Interact professionally with others	Create asset map. Discuss missing assets. Compare our community asset map to an ideal map.
Unit 2: Getting Informed: Youth Food Policy & Access in Baltimore Objectives: Students get informed about the root causes of food insecurity and where to find related information.			
Class Topic	Objectives	Desired Outcomes	Activities
Food in the Community	Students update their asset map to show food insecurity versus security in the community.	Think critically Describe food security versus insecurity	Discussion and photo-journaling of food insecurity versus security. Students also introduced to 'healthy food priority areas.'
Root Causes of & Community Response to Food Insecurity	Students will analyze food security in terms of its symptoms and causes and understand what root causes are and how to identify them	Think critically Describe food security versus insecurity Identify ways the community has responded to food insecurity	Discussion and handout on root causes of food insecurity in Baltimore.
Food Information in Baltimore	Students will learn from the Baltimore Food PAC where to go for information in Baltimore and some basic information.	Identify where to go for food information in Baltimore	Meeting with the Food Policy Action Coalition at The Food Project to discuss food information in Baltimore.

		<p>List important people involved in food in Baltimore</p> <p>Communicate effectively</p> <p>Interact professionally</p>	
Food Policymaking in Baltimore	Students will learn from Baltimore City policymakers about how food policies are made and who is involved in the decision-making.	<p>Define policymaking</p> <p>Explain the basics of how food policy is made in Baltimore</p> <p>List some examples of food policymakers, programs, and policies in Baltimore</p> <p>Communicate effectively</p> <p>Interact professionally</p>	Field trip to Baltimore City Hall and the Office of Planning. Meeting with Food Policymakers.
Youth Meal Programs in Baltimore	Students will learn directly from stakeholders about the youth meal programs and how decisions are made.	<p>Explain how decision are made on the summer meals program for youth</p> <p>Communicate effectively</p> <p>Interact professionally</p>	Meeting with stakeholders in the youth summer meals programs and facilitated discussion about how decisions are made in Baltimore.
Unit 3: Getting Involved - Youth Action Research Project on Food Access & Policy in Baltimore			

Objective: Youth learn how to get involved in an action research project that will lead to the generation of policy recommendations to improve food security.			
Class Topic	Objectives	Desired Outcomes	Activities
Getting started & developing research questions	<p>To identify the youth development programs related to food security in their community</p> <p>For the class to discuss what they believe affects the quality and success of youth program</p> <p>To have the class determine how they want to go about researching and evaluating the youth programs in their community.</p>	<p>Think critically</p> <p>Manage time and goals</p> <p>Adapt to change</p> <p>Interact professionally</p>	Guest facilitator Alice Huang (from food Policy Action Coalition) will help lead discussion on selecting research questions/projects (and what we need to think about when making our final policy recommendations).
Developing surveys and interview guides	<p>Students will work with an expert facilitator to learn about the definition of a survey and interview and the value of using these methods.</p> <p>Students will also develop a survey and an interview guide for gathering information about local youth programs. They will also develop a plan for administering the survey and interview to key program providers and young people</p>	<p>Think critically</p> <p>Manage time and goals</p> <p>Adapt to change</p> <p>Communicate effectively</p> <p>Interact professionally</p>	Guest facilitator [TBD] from JHSPH is an expert in survey design. She will lead the group in creation of the survey. Guest facilitator [insert name] from JHSPH is an expert in interview design. She will lead the group in creation of interview guides.

Conducting surveys and interviews	Students develop a survey and an interview guide to collect information from youth food policy stakeholders.	Interact professionally Communicate effectively Manage time and goals Adapt to change	Interviewees will be invited to The Food Project or called on the phone to be interviewed. Surveys will be administered either online or in person if possible.
Analyzing the data	Students tally all of the data and determine how to show it with the help of this week's guest expert.	Think critically Manage time and goals	Guest facilitator [TBD] from JHSPH is an expert in qualitative data analysis and forming policy recommendations from data. She will lead the group in creation of the data analysis.
Making a report and plans for public presentation	Students set policy recommendations based on the data and prepare a short report and presentation.	Communicate effectively Manage time and goals	Alice Huang will return as guest facilitator to guide the process of making a short report and policy recommendations, as well as help prepare students for a public presentation.
Field trip to City Hall for student presentation to policymakers on food policy	Students present their findings to stakeholders.	Communicate effectively Adapt to change Manage time and goals Interact professionally	Youth will work with Baltimore City Food Policy Initiative and Johns Hopkins School of Public Health researchers to translate data to public health policy and advocate for food security in their neighborhood.

Table 2: Assessment Plan

Instrument Name & Validation Evidence	Instrument Type	What is it assessing? What information is it collecting?	Taken By:
Professionalism Assessment ^{43,32,33}	Survey	Time management, respect, preparedness, appearance, quality of work, teamwork	Guest experts, collaborators, instructors, students
GORP (General Observation & Reflection Platform; modified COPUS & 21 st century skills protocols) ^{33,44,45,34,46}	Observation	Engagement, respect, preparedness, teamwork, adaptability, critical thinking, problem solving, teaching methods, use of scientific method	Research team
Baseline & Post-Course Student Assessment of their Learning Gains (SALG) ⁴⁷⁻⁴⁹	Survey	Teaching methods, engagement, teamwork, adaptability, critical thinking, time and goal management, use of scientific method, collaboration	Students, instructors
Community Mapping Assessment ^{50,51}	Survey	Time management, respect, preparedness, appearance, quality of work, teamwork	Students, instructors
Research Project Team Assessment	Survey	Time & Goal Management, Dependability & Shared Responsibility, Listening, Questioning, & Discussing, Research & Information Sharing, Communications, Problem-Solving, Teamwork	Students, instructors
Stakeholder Interview Guide	Interview Guide	Best practices, feasibility, barriers, stakeholders and key players, & advice for youth-driven policymaking; best practices and examples of co-creation & civic engagement in Baltimore	Key Stakeholders
Focus Group Facilitation Guide	Focus Group Guide	Teaching methods, youth background (dreams, hopes, fears, barriers)	Students, Instructors