| Level | Input | Output | Output Measures | Outcomes | Outcome Measures |
|----------------------|--|--|--|---|---|
| Students | 1.1) SEBA provides a free afterschool STEM program designed to | Students attend% of afterschool programming per | Attendance sheet | Short-Term: students develop positive beliefs about and | Post-surveys; student interviews; |
| | teacn students math and science concepts paired with engineering design thinking | semester | | awareness of STEM and STEM careers | tracking students after graduating from SEBA |
| | | | | Medium-Term: improved student academic | |
| | | | | actilevernent; increased engagement in school | |
| | | | | Long-Term: interest in high school math and science | |
| | | | | careers | |
| | | Students are engaged and excited about SERA | Observations: mentor | | |
| | | programming | reflections; post- | | |
| | | | programming Interviews (if we do this) | | |
| | 1.2) SEBA takes students on STEM-related field trips | Students attend% of field trips per semester | Attendance sheet | Short-Term: students develop positive beliefs about and | Post-surveys; student interviews; |
| | | Students are engaged and excited about field trips | Observations; mentor | awareness of STEM and STEM careers | tracking students after graduating |
| | | | reflections; post- programming Interviews (if | Medium-Term: improved student academic | II OIT JEDA |
| | | | we do this) | achievement; increased engagement in school | |
| | | Students are able to connect STEM learning to field trip experience | Observations | Long-Term: interest in high school math and science | |
| | | | | courses; attending college; pursuing STEM majors and careers | |
| | | <u> </u> | | <u> </u> | <u> </u> |
| | 1.3) SEBA pairs students with undergraduate engineering mentors who help facilitate STEM curriculum and project learning | 100% of students actively engage in the STEM lesson | Observations | Short-Term: students develop positive beliefs about and | Post-surveys; student interviews; |
| | who help recircate a territor concording and project rearring | | | uwarencas of a remain and a rem Calleers | from SEBA |
| | | Students are able to better understand the math and science concepts and connect them to the engineering | Observations | Medium-Term: improved student academic achievement; increased engagement in school | |
| | | design activity | | and a set of second and a second | |
| | | Students can better identify as a "STEM" person | Post-survey; student focus group interviews | Long-Term: interest in high school math and science courses; attending college; pursuing STEM majors and | |
| | | | b ap into news | careers | |
| | 1.4) SEBA facilitates a Science Fair to give students an avenue to | 100% of students participate in the Science Fair | Attendance sheet | Short-Term: students develop positive beliefs about and | Post-surveys; student interviews; |
| | demonstrate their learnings from the year | Students identify as a "STEM" person through self- | Focus group interviews | awareness of STEM and STEM careers | tracking students after graduating from SEBA |
| | | recognition and recognition by family | | Medium-Term: improved student academic | |
| | | Students are able to explain the engineering design process of their selected project | Observations | acnievement; increased engagement in school | |
| | | | | Long-Term: interest in high school math and science | |
| | | | | correers | |
| Mentors | SEBA provides semesterly professional development for mentors | Mentors are better equipped to implement STEM lessons during the competer | Reflection responses; end | Short-Term: Students have a positive learning experience | End of semester interviews; mentor |
| | iocuses on peologogy, their role as mentors, and | ouring the semester | or semescer interview | nuanced understanding and appreciation of their | ionow up interviews |
| | | | | students' lived experiences | |
| | | | | Medium-Term: Mentors continue to volunteer and/or | |
| | | | | serve as mentors in the future | |
| | | Mentors are better able to connect and facilitate STEM | Observations; mentor | Long-Term: Mentors are committed to life-long service to | |
| | | learning with the students | reflections; end of semester interviews | their community, encouraging more youth from underserved communities to pursue STEM | |
| | SEBA provides a stipend for mentors | Mentors are more committed to showing up to their | Attendance sheet | Short-Term: Students and mentors develop a strong | Observations; student focus groups; |
| | SEBA creates and delivers curriculum and material kits for lessons | Mentors are able to deliver high quality lessons to | Observations | Short-Term: Mentors have a positive teaching experience | Observations; end of semester |
| | | students | | with SEBA students | interviews; list of active mentors for |
| | | mentors are able to focus on building relationships with students as opposed to lesson planning and acquiring | observations; end of semester interviews; | Medium-Term: Mentors continue serving as SEBA | interesentesters |
| | | materials | mentor reflections | mentors in subsequent semesters | |
| | SEBA supports the mentors with a dedicated program manager | Mentors are better able to resolve challenges and run programming smoothly | Observations | Short-Term: Mentors have a positive teaching experience with SEBA students | Observations; end of semester interviews; list of active mentors for |
| | | | | Madium Turni Manhammati | future semesters |
| | | | | mentors in subsequent semesters | |
| | SEBA facilitates collaboration meetings between mentors and pre- | Mentors have a better understanding of their role with | End of semester interviews; | Short-Term: Mentors have a positive teaching experience | Observations; end of semester |
| | service teachers | students and with pre-service teachers | mentor reflections | with SEBAstudents | Interviews; list of active mentors for future semesters |
| | | Mentors can better support student learning | Observations | Medium-Term: Mentors continue serving as SEBA | |
| | CED A land a supplier market market | Mentors' experience with SEBA is more enjoyable | End of semester interviews | mentors in subsequent semesters | Observations and f |
| | SEDA IEBUS WEEKIY MENTOR MEETINGS | Mentors' reflect, acknowledge areas of improvements. | Accendance sheet Observations; mentor | with SEBA students | interviews; list of active mentors for |
| | | and make action plans | reflections | Medium-Term: Mentors continue coving or SERA | future semesters |
| | | Mentors develop camaraderie among other mentors, making a more enjoyable SEBA experience | Observation; end of semester interview | mentors in subsequent semesters | |
| | | Mentors discuss with other mentors and SEBA program | Observations; mentor | 1 | |
| | SEBA founder and lead PI regularly interfaces with mentors in SEBA | manager about their experience | reflections Mentor reflections: and of | Short-Term: Mentors have a notitive experience with | Observations: end of comector |
| | as well as in the classroom and other engineering-related activities | and the second regard to the sebu program | semester interviews | SEBA | interviews; list of active mentors for |
| | at the university | Mentors feel more connected to the university and | Mentor reflections; end of | Medium-Term: Mentors continue serving as SERA | future semesters; track graduation and iob placement |
| | | engineering department (greater sense of belonging) | semester interviews | mentors in subsequent semesters | ,, |
| | | | | Long-Term: Mentors develop positive STEM identity and | |
| Des services 7 | CEDA facilitates collectore to the second | | Fod of comments of the state | persist in engineering | |
| Pre-service Teachers | SEBA facilitates collaboration meetings between mentors and pre- service teachers | Pre-service have a better understanding of their role with students and mentors | End of semester interviews; observations | | |
| | | Pre-service teachers can better support student learning | Observations; exit tickets | 1 | |
| | | Pre-service teachers' experience with SERA is more | End of semester interviewe | 4 | |
| | | enjoyable | | | |
| | SEBA creates and delivers curriculum and material kits for lessons | Pre-service teachers can focus on developing classroom | Observations; end of | | |
| | | developing lessons | semester interviews | | |
| Parents | SEBA conducts a parent session before the start of SEBA | % of parents attend | Attendance sheet | Short-Term: Parents trusts and has a positive connection | Observations; student attendance; |
| | programming | Parents have a better understanding of theirs and their | Observations | with the SEBA program and staff | communication between mentor and parent |
| | | child's commitment and expectations for participation | | Medium-Term: Parents are advocates of the SEBA | ot |
| | SEBA Implements Saturday SEBA sessions with parents | % of parents attend Parents are engaged in STEM learning with their child | Attendance sheet Observations | Short-Term: Parents trusts and has a positive connection with the SEBA program and staff | Observations; student attendance; communication between mentor |
| | | Sector Se | | Modium Torm: Darageterer adverse fill 650 t | and parent |
| | | | | programming and encourages their child to persist | |
| | | | | Long Torm: Dyrante "" their shild | |
| | | | | Congerenti, Parents see their Child as a STEM person | |
| | SEBA coordiantes an end of the semester community science fair | % of parents attend | Attendance sheet | Short-Term: Parents trusts and has a positive connection | Observations; student attendance; |
| | | Parents understand what their child learned during the semester | upservations | with the SEDA program and statt | and parent |
| | | | | Medium-Term: Parents are advocates of the SEBA | |
| | | | | uniting one circourages their child to persist | |
| | | | | Long-Term: Parents "see" their child as a STEM person | |
| | | 1 | | 1 | |

| Level | Input | Output | Output Measures | Outcomes | Outcome Measures |
|----------|---|--|---|--|--|
| Students | 1.1) SEBA provides a free afterschool STEM program designed to teach students math and science concepts paired with engineering design thinking | Students attend% of afterschool programming per semester | Attendance sheet | <u>Short-Term</u> : students develop positive beliefs about and awareness of STEM and STEM careers <u>Medium-Term</u> : improved student academic achievement; increased engagement in school <u>Long-Term</u> : interest in high school math and science courses; attending college; pursuing STEM majors and careers | Post-surveys; student interviews; tracking students after graduating from SEBA |
| | | Students are engaged and excited about SEBA | Observations; mentor | | |
| | | programming | reflections; post- programming Interviews (if | | |
| | | | we do this) | | |
| | 1.2) SEBA takes students on STEM-related field trips | Students attend% of field trips per semester | Attendance sheet | Short-Term: students develop positive beliefs about and | Post-surveys; student interviews; |
| | | Students are engaged and excited about field trips | Observations; mentor reflections; post- programming Interviews (if we do this) | awareness of STEM and STEM careers <u>Medium-Term</u> : improved student academic achievement; increased engagement in school | tracking students after graduating from SEBA |
| | | Students are able to connect STEM learning to field trip experience | Observations | Long-Term: interest in high school math and science courses; attending college; pursuing STEM majors and careers | |
| | 1.3) SEBA pairs students with undergraduate engineering mentors who help facilitate STEM curriculum and project learning | 100% of students actively engage in the STEM lesson | Observations | <u>Short-Term</u> : students develop positive beliefs about and awareness of STEM and STEM careers | Post-surveys; student interviews; tracking students after graduating from SEBA |
| | | Students are able to better understand the math and science concepts and connect them to the engineering design activity | Observations | Medium-Term: improved student academic achievement; increased engagement in school | |
| | | Students can better identify as a "STEM" person | Post-survey; student focus group interviews | Long-Term: interest in high school math and science courses; attending college; pursuing STEM majors and careers | |
| | 1.4) SEBA facilitates a Science Fair to give students an avenue to demonstrate their learnings from the year | 100% of students participate in the Science Fair | Attendance sheet | Short-Term: students develop positive beliefs about and awareness of STEM and STEM careers Medium-Term: improved student academic | Post-surveys; student interviews; tracking students after graduating |
| | | Students identify as a "STEM" person through self- recognition and recognition by family | Focus group interviews | | from SEBA |
| | | Students are able to explain the engineering design process of their selected project | Observations | achievement; increased engagement in school | |
| | | | | courses; attending college; pursuing STEM majors and careers | |

| Mentors | SEBA provides semesterly professional development for mentors focused on pedagogy, their role as mentors, and | Mentors are better equipped to implement STEM lessons during the semester Mentors are better able to connect and facilitate STEM | Reflection responses; end of semester interview Observations; mentor | Short-Term: Students have a positive learning experience and relationship with mentors; mentors have more nuanced understanding and appreciation of their students' lived experiences <u>Medium-Term</u> : Mentors continue to volunteer and/or serve as mentors in the future <u>Long-Term</u> : Mentors are committed to life-long service to | End of semester interviews; mentor follow up interviews |
|---------|---|--|--|---|---|
| | | learning with the students | reflections; end of | their community, encouraging more youth from | |
| | SEBA provides a stipend for mentors | Mentors are more committed to showing up to their assigned days, evidenced by at least% attendance | Attendance sheet | <u>Short-Term</u> : Students and mentors develop a strong relationship | Observations; student focus groups; end of semester mentor interviews |
| | SEBA creates and delivers curriculum and material kits for lessons | Mentors are able to deliver high quality lessons to students | Observations | <u>Short-Term</u> : Mentors have a positive teaching experience with SEBA students | Observations; end of semester interviews; list of active mentors for |
| | | Mentors are able to focus on building relationships with students as opposed to lesson planning and acquiring materials | Observations; end of semester interviews; mentor reflections | Medium-Term: Mentors continue serving as SEBA mentors in subsequent semesters | future semesters |
| | SEBA supports the mentors with a dedicated program manager | Mentors are better able to resolve challenges and run programming smoothly | Observations | <u>Short-Term</u> : Mentors have a positive teaching experience with SEBA students | Observations; end of semester interviews; list of active mentors for future semesters |
| | | | | <u>Medium-Term</u> : Mentors continue serving as SEBA mentors in subsequent semesters | |
| | SEBA facilitates collaboration meetings between mentors and pre- service teachers | Mentors have a better understanding of their role with students and with pre-service teachers | End of semester interviews; mentor reflections | Short-Term: Mentors have a positive teaching experience with SEBA students | Observations; end of semester interviews; list of active mentors for future semesters |
| | | Mentors can better support student learning | Observations | Medium-Term: Mentors continue serving as SEBA | |
| | | Mentors' experience with SEBA is more enjoyable | End of semester interviews | mentors in subsequent semesters | |
| | SEBA leads weekly mentor meetings | Mentors attend% of weekly mentor meetings Mentors' reflect, acknowledge areas of improvements, | Attendance sheet Observations; mentor | <u>Short-Term</u> : Mentors have a positive teaching experience with SEBA students <u>Medium-Term</u> : Mentors continue serving as SEBA mentors in subsequent semesters | Observations; end of semester interviews; list of active mentors for future semesters |
| | | Mentors develop camaraderie among other mentors, making a more enjoyable SEBA experience | Observation; end of semester interview | | |
| | | Mentors discuss with other mentors and SEBA program manager about their experience | Observations; mentor reflections | | |
| | SEBA founder and lead PI regularly interfaces with mentors in SEBA as well as in the classroom and other engineering-related activities at the university | Mentors have greater loyalty to the SEBA program | Mentor reflections; end of semester interviews | <u>Short-Term</u> : Mentors have a positive experience with SEBA | Observations; end of semester interviews; list of active mentors for future semesters; track graduation |
| | | Mentors feel more connected to the university and engineering department (greater sense of belonging) | Mentor reflections; end of semester interviews | Medium-Term: Mentors continue serving as SEBA mentors in subsequent semesters | and job placement |
| | | | | Long-Term: Mentors develop positive STEM identity and persist in engineering | |

| Pre-service Teachers | SEBA facilitates collaboration meetings between mentors and pre- service teachers | Pre-service have a better understanding of their role with students and mentors | End of semester interviews; observations | | |
|----------------------|--|--|---|---|---|
| | | Pre-service teachers can better support student learning | Observations; exit tickets | | |
| | | Pre-service teachers' experience with SEBA is more enjoyable | End of semester interviews | | |
| | SEBA creates and delivers curriculum and material kits for lessons | Pre-service teachers can focus on developing classroom management skills and content delivery as opposed to developing lessons | Observations; end of semester interviews | | |
| Parents | SEBA conducts a parent session before the start of SEBA programming | % of parents attend | Attendance sheet | <u>Short-Term</u> : Parents trusts and has a positive connection with the SEBA program and staff <u>Medium-Term</u> : Parents are advocates of the SEBA | Observations; student attendance; communication between mentor and parent |
| | | Parents have a better understanding of theirs and their child's commitment and expectations for participation | Observations | | |
| | SEBA implements Saturday SEBA sessions with parents | % of parents attend | Attendance sheet | Short-Term: Parents trusts and has a positive connection with the SEBA program and staff <u>Medium-Term</u> : Parents are advocates of the SEBA programming and encourages their child to persist <u>Long-Term</u> : Parents "see" their child as a STEM person | Observations; student attendance; communication between mentor and parent |
| | | Parents are engaged in STEM learning with their child | Observations | | |
| | SEBA coordiantes an end of the semester community science fair | % of parents attend | Attendance sheet | <u>Short-Term</u> : Parents trusts and has a positive connection with the SEBA program and staff <u>Medium-Term</u> : Parents are advocates of the SEBA programming and encourages their child to persist <u>Long-Term</u> : Parents "see" their child as a STEM person | Observations; student attendance; |
| | | Parents understand what their child learned during the semester | Observations | | communication between mentor and parent |