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Ka Pilina Noe‘au II

A. NEED FOR PROJECT

[redacted]

A.(i) The magnitude of the need for the services to be provided.

Need for a Diverse, STEM-Capable U.S. Workforce. Science, technology, engineering, and mathematics, collectively known as STEM is a vital field in the 21st Century society. Within the past decade, the number of STEM jobs increased at a rate of 24.4% between 2005 to 2015, compared to just 4% for non-STEM employment (Noonan, 2017), and will continue to grow at a faster rate than non-STEM occupations. The U.S. Bureau of Labor Statistics (2019) forecasts STEM fields to grow by 10.8% while overall employment in the economy to grow by 7.4% between 2016 and 2026 (Noonan, 2017). A similar trend is seen in Hawaii's STEM employment; STEM jobs are expected to increase by an average of 11% from 2018 to 2028 (The Alliance for Science & Technology Research in America, 2019). With the rapidly growing STEM jobs, there is a continuous demand for STEM workers. Despite this, there is a notable shortage of qualified or STEM-capable workers (NSF, 2018). National Association of

Manufacturing and Deloitte found that 2 million STEM jobs of the 3.5 million STEM jobs will remain unfilled by 2025 (Weiner, 2018). Further, the New American Economy Research Fund (2020) concluded from their study that the U.S. has a persistent shortage of STEM workers that has worsened over time. Their study found that between 2010 and 2015, the ratio of STEM jobs posted online to unemployed STEM workers was 17 to 1 in comparison to back in 2010, in which the ratio was 5.4 to 1. In Hawaii, this ration was 14.1 to 1. The shortage of workers is pronounced in the computer science area. According to the Bureau of Labor Statistics (2019), there will be 1.4 million available computer science jobs by 2020.

Need for Access to Quality STEM Education. In September 2017, the President signed a Memorandum to increase access to high-quality STEM education for all in the U.S. (Presidential Memorandum, 2017). Additionally, National Science Board Vice Chairman posits that "STEM knowledge and skills enable both individual opportunity and national competitiveness, and that the nation needs to develop ways to ensuring access to high-quality education and training experiences for all students at all levels and for all workers at all career stages."

The 2010 U.S. Census reported underrepresented minority populations of African Americans, Hispanics, Native Americans, and NH, and Pacific Islanders comprised 31.1% of the total U.S. population (U.S. Census Bureau), yet the representation in STEM fields remain low collectively. When taking NHs alone, by the year 2060, the NH population is projected to exceed 1.2 million, signaling an increasing need for educational programs and services (Kamehameha Schools, 2014). Yet, NHs have relatively lower levels of formal schooling than non-natives due to economic barriers (Hawai‘i Papa O Ke Ao, a report presented to the University of Hawai‘i Board of Regents, 2012; Tran et al., 2010). Moreover, NH students are overrepresented in special education by an average of 11.3%, with 15.4% in special education, compared with 9.7% among non-Hawaiian students (Kamehameha Schools, 2014). This is significant in that STEM jobs often require specialized skills even if the position does not require a Bachelor’s degree (Rothwell, 2013; NSF, 2018) and both the economic barrier and academic barrier limits the opportunities for NH students to pursue careers in STEM. There is a growing interest in STEM by all students including underserved (minority students including NHs, low income, and/or first generation college) students, but underserved students lag far behind their peers in meeting the STEM benchmark (ACT, 2016) widening the gap between underserved students and their counter peers in the STEM fields. Moreover, parents of minority students tend to believe that STEM subjects are too difficult, boring or exclusionary (PCAST, 2010) and not as supportive in a child's endeavors in pursuing a STEM career. STEM shortage must be addressed first by addressing the needs in quality STEM education.

A.(ii) Gaps, nature, and magnitude of these gaps, and how they will be addressed.

In further examining the needs, there are several gaps to be addressed.

Gap 1. Lack of mentors & role models. One reason for the underrepresentation of minorities in the STEM workforce is because there are few visible role models and mentors in STEM(Committee on Equal Opportunities in Science and Engineering, 2013). Mentorship can provide students the opportunity to engage in real conversation and encourages a lasting interest in STEM. To address the lack of mentors, in KPN II, high school students will intern as junior camp mentors for K-5 grade students. Cross-age peer mentoring creates a unique relationship between students who are close enough in age to be able to relate to each other, but far enough away that the mentors are still able to provide guiding leadership roles (Karcher, 2008). Cross-age peer tutoring-mentoring has proven effective for increasing academic achievement for students without and with disabilities across core subjects and across disabilities, even more effective than adult tutoring-mentoring (Holecek, 2012; Okilwa & Shelby, 2010; Watts, Bryant, & Carroll, 2019).

Gap 2. Teachers are not prepared to deliver an integrated STEM curriculum nor STEM content through culturally responsive means. Although high quality education in STEM can engage all students in STEM and improve their outcomes in STEM, most teachers and other school personnel do not know how to operationalize STEM teaching (Kelley & Knowles, 2016) or have the content knowledge of science, technology, engineering and mathematics (Eckman et al., 2016). Elementary grade level teachers are even more overwhelmed and underprepared to teach STEM curriculum (Lachapelle & Cunningham, 2014). Furthermore, teachers have not been trained in culturally responsive teaching or to interpret linguistic, cultural, and socio-economic characteristics (Ortiz & Yates, 2002). Thus, especially for elementary level teachers, teachers need to be better prepared to utilized culturally and contextually based teaching strategies and know-how to engage students with an integrated STEM curriculum. This will be accomplished through teacher professional development (PD) on integrated STEM curriculum, culturally responsive teaching, Universal Design for Learning and opportunity for teachers to use the MSL Model curriculum in an authentic environment during summer camps.

Gap 3. Limited Engagement with STEM at Home. Many children, especially minorities and students with disabilities, are at a disadvantage in STEM education and employment even before they begin schooling as a result of their home environment. Parental attitudes towards STEM, directly and indirectly, influence the value their child attributes to STEM, and children of parents who have little experience or anxiety with STEM have been found to inherit similar anxieties with STEM. Attitudes towards STEM developed in these formative years along are the foundation of a child's attitudes and motivation towards learning STEM for any future experiences they have with STEM (Garriott et al. 2014; Rice et al., 2013; Wang & Degol, 2013). Studies have shown that students benefit when programs bridge the gap between home and school by providing resources and opportunity for parents to participate in STEM-related assignments, activities, or events (Bottoms et al., 2017; Galindo & Sheldon, 2012; Mantzicopoulos, Patrick, & Samarapungavan, 2013). KPN II will similarly bridge this gap by implementing parent workshops to develop and support parents' basic math skills and engage parents in their child's learning and their sense of belonging.

Gap 4. Discrepant in Math and Science Performance. The shortage of quality STEM workers may have a foundation in weak math skills. Students' math performance remains dismal over time, especially among NH students. The 2019 National Assessment of Educational Progress (NAEP) revealed that NH students scored below the national average by 11 scale points at grade 4 (229 vs. 240) and 9 scale points at grade 8 (274 vs. 283) in math. Likewise, a similar pattern was observed in science performance as well, with NH/PI students lagging behind the other ethnic groups and the gap also widens over time. For example, the average scores for White, Asian, Hispanic students in 2015 were higher than NH/PI students (166, 164, 140, respectively vs. 138 points), while the average score for NH/PI students was not measurably different from the scores in previous years (McFarland et al., 2019). In Hawai'i, NH students, the largest K-12 public school ethnic group (26%), scored 18.4 percentage points lower than their non-NH peers (28.4% vs. 46.8%) in math proficiency scores and such gap was seen as early as third grade (37.3% vs. 54.9%), based on the statewide 2016 Smarter Balanced Assessment (SBA) results (HIDOE, 2017). Notably, this gap persisted from grade 3 to grade 11. The discrepant math and science scores will continue to be addressed by implementing the MSL Model, which is a hands-on, culturally responsive, STEM integrated curriculum with appropriate formal and informal assessments. The proposed project, KPN II, will utilize the MSL Model developed and further refined to address the gaps identified.

B. QUALITY OF THE PROJECT DESIGN

B.(i) Appropriate Design to Address the Needs of the Target Population

Appendix A provides an overview of the project design and the MSL Model components. The overarching **goal** of the project is to increase STEM engagement and improve math and science knowledge and competencies of NH students in grades K to 5 to ultimately contribute to a diverse, STEM capable workforce for the future of our society. To meet this goal, the proposed project design takes a holistic approach to address the various needs identified (as described in Section A). Additionally, these activities address four of the FY2020 absolute priorities and both of the competitive priorities. How these priorities are addressed follow:

Beginning reading and literacy. MSL Model begins with reading and vocabulary activity for each lesson along with STEM exploration. The current MSL Model has 20 minutes of reading and vocabulary lessons, but this will be extended to 30 minutes to account for more direct intervention for at-risk learners and students with learning disabilities (Allington, 2011). During this time, students may do a card sort activity to sort all the words or symbols that mean add (e.g.

sum, plus, +, more) in a pair and then come up with a story using each word. Hawaiian legend and stories are presented to provide context to the hands-on activities. 2-5th graders will learn to use graphic organizers such as a Frayer Model (Frayer et al., 1969) to become an active reader to ask questions before, during and after reading. To take a holistic approach, all parents in the intervention group will be provided with resources on children's books and literature that they can read with their child or youth at home to talk about math and science concepts.

The needs of at-risk children. MSL Model was developed for all students, but with special attention to students who are exceptional. Exceptional is defined as students who have disabilities or at risk of identification for special education due to underachievement in math and/or science and students who are gifted and talented or have potential in math and/or science. As described in Section A, NH students lag behind math and science achievement and are underprepared in the STEM field. This is a missed opportunity for untapped talents. For this iteration, at risk is defined as students in K-5th grade who are struggling in math, students who are identified as having learning disabilities, or those who are from low-socioeconomic status. Research has shown that students from low SES develop academic skills at a slower rate than students from higher SES groups (Morgan, et al., 2009). However, the gap as explained in Section A can be addressed. The needs of at risk learners are also addressed by utilizing informal and formal assessments that are less culturally biased.

Needs in fields or disciplines in which NH are underemployed. MSL Model is developed to increase students' interests, engagement, and achievement in STEM, ultimately leading the students to continue pursuing the field. With the addition of computer science at a younger age, students may be more open to pursuing computer science as a career.

The use of the Hawaiian language in instruction. MSL Model incorporates Hawaiian language, stories, and values to make STEM education meaningful to them and to their environment in which they are members of. [redacted]

[redacted]

Competitive Preference Priority 1. *Promoting STEM education with a focus on computer science.* MSL Model consists of 12 lessons in science and math utilizing technology and engineering concepts. From the KPN project, students commented that they enjoyed the robotics programming lessons and want to do more of the lessons. Therefore, the Computer Science Fundamentals curriculum will be adapted and incorporated up to a third of the MSL curriculum. CS curriculum is developed especially for K-5th graders, and each lesson can be used individually. The lessons also incorporate vocabulary and literacy development at the beginning and reflection at the end. These lessons will be reviewed and during Phase I, will be incorporated into the current MSL Model curriculum.

Competitive Preference Priority 2. *Fostering Flexible and Affordable Paths to Obtaining Knowledge and Skills in in-demand occupation (teaching and STEM).* For this iteration of KPN II, 44 high school students will be trained as junior camp mentors for the K-5th grade students. This has a dual purpose. First, this provides an opportunity for elementary students to interact and learn from high school students who are closer in age than teachers or college students through cross-age mentoring. Secondly, NH high school students will have the opportunity to gain work-based experience in teaching at risk students. NH high school students who will be recruited as junior camp mentors will go through an internship training program over 2 semesters (12 weeks). The training will include developing soft skills such as communication skills, creative thinking, adaptability, etc. professionalism, and teaching skills in STEM. Harris and Rogers (2008) called for an increase in soft-skill training within technical training programs at an earlier age to prepare for entering university-level training in technology, engineering, and related fields. Recent literature continues to call for the emphasis and direct instruction (in the form of group problem-solving, group projects, real-world role-playing, internships, situated learning, inter- and multi-disciplinary collaboration) of these soft skills for students (especially for minority students and students with disabilities entering predominately non-minority workforce) at a college and high school level to compete in the 21st century STEM workplace, and recommend instruction (Cho, Morthland, Kidd, & Adkinson, 2015; Kasza & Slater, 2017; Lawler, Joseph, & Greene, 2018; Sahin, Gulacar, & Stuessy, [redacted] Taningco, 2008). By teaching STEM to elementary students, junior camp mentors will also be able to brush up on their math and science skills. As these junior camp mentors increase their interest and readiness, there is a higher likelihood that they will be in the STEM field (ACT, 2016) as well as in teaching special education, a high need occupation.

Design of the Proposed Project

The project will have a three-phase design as described in Appendix A. Phase I-Development (9/2020-12/2020) goals are: **(1)** Refine MSL Model lessons and assessments with NH & STEM experts & teacher input; **(2)** Refine parent workshop sessions to better include Hawaiian values and language by having cultural experts' review; **(3)** Adopt existing teacher PD modules to for teacher PD; **(4)** Develop junior mentor internship training modules; and **(5)** Confirm schools, subcontracts, service-learning sites, and recruit participants. During this phase, the MSL Model will be reviewed and the results [redacted] will be analyzed (September 2020) and shared with the NH & STEM experts and teachers. The lessons that were found to be least effective will be removed and replaced with computer science-based lessons adopted from CS Fundamentals Curriculum (https://code.org/curriculum/unplugged). The lessons will be reviewed for alignment with other MSL Model lessons. Similarly, parent sessions will be revisited [redacted] further refinement and addition of Hawaiian language lessons for each lesson. Teacher PDs [redacted] will be developed for teachers to be able to take the course through the Hawaii Department of Education Professional Development site (PDE3). The PD will cover topics on integrated STEM education, culturally responsive teaching, universal design for learning, and MSL Model curriculum. PD will be offered as a hybrid course and each session will be 4 hours long, offered

once every 3 weeks for 6 times before the summer camp. A total of 36 teachers will be recruited for over 3 years. Junior camp mentor internship training will be modeled after [redacted] mentor training modules and include topics on professionalism, FERPA and data confidentiality, mentoring, soft skills, teaching elementary grade students, teaching exceptional students, and MSL Model curriculum. The internship will take place after school in the evenings and Saturdays. The internship will be a total of 30 hours before summer camp (8 months). Each session may be different lengths depending on the topic and range from 1.5 hours to 3 hours. A total of 44 Junior camp mentors will be recruited from participating school districts over the three years. [redacted]
Recommended mentors and self-elected mentors will be interviewed for their commitment, reasons for application, and their interest in teaching elementary grade students. Each junior mentor will be paired with a mentor teacher during the camp. For K-1 grade level, there will be two junior camp mentors who will support the mentor teacher to keep the teacher/mentor to student ration as close to 1: 5.

<u>Phase II-Implementation (1/2021-8/2023)</u> goals are: **(6)** Implement the mentor PD modules and a summer camp (01-08/2021); **(7)** Implement the mentor internship modules, parent workshops, and a summer camp (09/2021-08/2022; 09/ 2022-08/2023); and **(8)** Evaluate the effectiveness of the refined MSL Model. [redacted] **The quasi-experimental study** will be conducted to test the MSL Model with (intervention) and without (control) parent workshop. Parent workshops are implemented before the summer camp for the intervention group school students.

[redacted]

During 2.5 weeks of summer camp, MSL Model will be implemented for both groups.

Students' daily activities include informal and formal assessments (10 minutes); math exploration activities with the use of Hawaiian language (10 minutes); reading and vocabulary practice (Reading and Math literacy) (30 minutes); collaborative, hands-on culturally responsive, real world problem-based learning or play (60 minutes); and reflection (10 minutes). An example lesson is presented in Appendix C. In addition, students will participate in service learning to contribute back to the community with the new STEM skills acquired. The service-learning trip will be half a day, which takes place in addition to the sessions.

<u>Phase III-Finalization & Dissemination (1/2023 to 8/2023)</u> goals are: **(9)** finalize and disseminate the model, products, and findings and **(10)** develop a sustainability plan. Table 1 Management Table in Section E shows the goals, objectives, and milestones/outputs. An evaluation plan is described in Section F.

(ii) The extent to which the proposed project demonstrates a rationale.

First, KPN II takes a holistic approach by providing intervention to the students themselves, but also to agents that influence students such as parents, teachers and junior camp mentors. As the Hawaiian word *Pilina* suggests, the proposed project KPN II will *connect* participating NH K-5 students, especially those at risk (e.g.disengaged from math and science, students with learning disabilities, and/or those who are from low socioeconomic status) (absolute priority b) to the following: (1) culturally responsive hands-on math and science activities including computer science lessons (competitive preference priority 1); (2) beginning reading and literacy through STEM vocabulary building and exploration activities (absolute priority a); (3) high school interns as junior mentors who will be gaining work-based skill in teaching at risk students and STEM curriculum (competitive preference priority 2); (4) parents/caregivers through parent workshops; (5) teachers as mentors; and (6) community through service learning. The emotional connection that students make with their environment, peers, junior mentors, parents, teachers, and community can motivate them to engage in educationally purposeful activities, leading to increased outcomes in STEM learning (Strayhorn, 2012). By receiving the MSL Model, students thus, experience increased sense of belonging and space, which affects their attitudes and engagement in STEM, which in turn improves their achievements in STEM. As they experience achievements in STEM, they will be motivated and continue to improve their engagement, attitudes, and sense of belonging, ultimately leading them to pursue STEM field careers and contribute to diversifying the STEM workforce. See Figure 1. Theory of Change.

In addition, the curriculum itself is the key to the MSL Model. MSL Model is grounded within the situation cognitive theory (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991) where "knowledge is not independent but, rather, fundamentally "situated," is in part a product of the activity, context, and culture in which it is developed." (Brown et al., 1989).

[redacted]

[redacted]

The theory connects knowing and doing, which is an important aspect of STEM education. Furthermore, the Model MSL Model utilizes both math and science disciplines and makes explicit connections between the two subjects by aligning both concepts in a particular activity.

This explicit connection is crucial because students often are not able to spontaneously connect or integrate concepts across different situation or representation on their own (Pearson, 2017). Engineering design and technology tools are also intertwined in some of the lessons. Furner and Furner and Kumar (2007) contend that integrated STEM education provides "more relevant, less fragmented, and more stimulating experiences" (p.186). MSL Model takes the curriculum beyond the classroom by having the service learning, in which STEM content learned in the classroom can be utilized to solve issues in their community.

C. QUALITY OF PROJECT SERVICES

C(i) Strategies for Ensuring Equal Access and Treatment for Eligible Project Participants

The key personnel of the proposal are composed of a vast resource base of educators, cultural specialist, math specialist, and training, research, and evaluation specialists [redacted]

Strategy 1: Provide high-quality instruction. One of the main reasons for the underrepresentation of NH in STEM is poverty. NH has a higher rate of poverty, compared to other ethnic peers (Kamehameha School, 2014). Most impoverished minority children reside in underfunded and struggling schools, where students' potential in STEM can be easily overlooked, as focusing on struggling students and other issues such as dropouts, drug use, and teen pregnancy (Baker & Friedman-Nimz, 2002; Olszewski-Kubilius, & Thomson, 2010). The inequity in school funding leads to NH students' limited access to individualized or challenging, high-quality math or science instruction and further widening the achievement gap in math and science (Crisp & Nora, 2012; Ejiwale, 2013; Torres et al., 2014). To address this issue and encourage their full participation in KPN II, the project will ensure to provide high-quality instruction to all student participants, for both the intervention and the comparison group, by having trained staff, junior mentors, and teachers. More specifically, teachers who will implement the MSL Model will be trained on integrated STEM education and culturally responsive teaching. Junior mentors, who are high school students, will also go through training on how to teach diverse students, on building soft skills and the curriculum itself (also see Strategy 4).

Strategy 2: Provide transportation and equipment access. Transportation to participating in an out of school program may be another challenge for NH families. Thus, the project staff will implement the summer camp near the participants' community so that transportation does not become an issue for accessing the program. However, if there is a need, the project will provide bus/van transportation so that all interested students can fully participate without the need to worry about transportation. Additionally, all supplies and equipment such as computers, notebooks and STEM tools and manipulatives will be prepared by the proposed project, so that there is no burden on the family to purchase them.

Strategy 3. Provide culture-based learning opportunities. As a traditional educational system oftentimes adopts a Western instructional format and style, NH students have limited opportunities to learn in a method that is best aligned to their home cultures. As a result, many NH students may not receive equitable treatment or appropriate education within these traditional educational settings. Thus, in response to the substantial body of literature that suggests culture-based education is key to promoting academic engagement among NH students, KPN II will utilize a culturally-responsive learning environment incorporating evidence-based instructional strategies that are rooted in NH culture and community. Specifically, the curriculum design process will start with "seeing" learning through a cultural lens and identify the math and science learning opportunities that already exist in our local Hawaiʻi communities. Thus, the local Hawaiʻi context and culture will be the foundation for lessons and activities.

Strategy 4. Provide training and work with culturally competent mentors and role models. To address the issues of the need to improve teacher competency in integrated culturally responsive STEM education, teachers will go through a PD series and actually implement and apply the curriculum during summer camp. Also, to address the lack of NH role models, the project will recruit junior mentors who are NH high school students and will be trained in MSL Model, teaching skills, and soft skills. Furthermore, mentors will be selected based on their interests in math and science, who can serve as good role models for younger students. Previous KPN participants will be invited to serve as junior mentors as well. These mentors who have personal experience as struggling or excelling students in math and science will be able to relate to students of diverse abilities.[redacted]. will also guide the project cultural experts. Trained parents/caregivers and kupuna can also serve as cultural mentors. As part of exploration activities, students will have a chance to learn from role models, such as NH scientists [redacted]. All of these junior mentors and adults, involved in the project, will model and guide "mālama" behaviors, ultimately teaching students to self-monitor their behaviors to improve their intrinsic motivation (Blake, 2015). Involving them will help the project to achieve the cultural competence indicators of students, which are from the HI DOE HĀ BREATH framework.

Strategy 5. Provide options for parent workshop time. Though parents are integral participants in this project along with the students, many parents may not be readily available for the workshop. The staff will make every effort to have the workshop available at a time that the parents can participate by surveying the parents, providing advanced notices, and providing child care at the time of the workshop. During KPN, parent workshops were provided weekly, which made it difficult for many parents to commit. Therefore, parent workshops are also spread over two semesters (9-10 months) to allow for more time and location options and opportunities for make-up sessions.

C (ii). The project reflects up-to-date knowledge from research and effective practice.

KPN II will utilize the MSL Model developed in Ka Pilina No'eau. **MSL Model** is defined as a culturally responsive, accelerated and enriched math and science learning. [redacted]

[redacted]

[redacted]

[redacted]

C (iii) Likely impact on the intended recipients of the services.

The possible impacts of the proposed intervention on students are outlined in Section B and explained in the theory of change. **Intended student outcomes** are increased sense of belonging and place; attitude towards STEM; engagement in STEM; reading and math literacy; literacy in the Hawaiian language in STEM; math and science achievement; and STEM application skills. Intended **outcomes of intervention group parents** are improved sense of belonging and place, attitude towards STEM, math skills, understanding of diverse learners, and knowledge of resources in STEM in Hawaii. Intended **outcomes of junior mentors** are improved sense of belonging and place, attitude towards STEM, soft skills (e.g., problem-solving skills, team working skills, communication skills), and STEM application skills. Intended **outcomes of teacher mentors** are improved sense of belonging and place, culturally responsive teaching skills, and knowledge of integrated STEM education. The likelihood of the project achieving positive impacts on these outcome indicators is evident for the use of sound research-based models and the positive results of the projects used to build the proposed model. As also mentioned in Section Cii, the MSL Model reflects up-to-date knowledge from research and effective practice for participants, traditionally underrepresented. Therefore, it can be hypothesized that the proposed intervention will have similar, if not improved, impact on the target participants, and a synergetic impact may be anticipated from the additional components to the previously developed model.

D. QUALITY OF PROJECT PERSONNEL

D(i) Encouragement for Employment of Traditionally Underrepresented Groups

UHM is an equal opportunity employer and minority-serving institution. It has a long history of recruiting, training and advancing persons from traditionally underrepresented ethnic minority groups in education and employment. Following the procedures undertaken at the institution, the project will actively support participation, employment, and advancement of persons from underrepresented groups, particularly NH with and without disabilities, and address barriers to their equitable access or participation (*see GEPA Provision Statement*). Similar efforts will be made for recruiting teachers and junior camp mentors.

D(ii) Qualifications, including relevant training and experience, of key project personnel

Proposed personnel are well trained, diverse, highly qualified and have experiences of direct relevance to the project [redacted]

[redacted]

[redacted]

[redacted]

E. MANAGEMENT PLAN

E(i) Management Plan Table 1 provides a clear representation of the project objectives and activities that will be addressed to achieve the identified goal, objectives, and benchmarks.

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Table 2. Key Personnel Loading Chart

Project Staff	Obj. 1	Obj. 2	Obj. 3	Obj. 4	Obj. 5	Obj. 6	Obj. 7	Obj. 8	Total FTE
[redacted]									

F. PROJECT EVALUATION

Evaluation Model: Appendix D shows the evaluation logic model. A culturally responsive evaluation model will be used to respect and consider the culture of participants in evaluation (Frierson, Hood, & Hughes, 2002; Frierson, Hood, Hughes, & Thomas, 2010). Using the model, the Co-PI/internal evaluator will work with evaluation partners (i.e., Alu Like, mentors, project staff), who have lived in the culture with the participants, to describe the context and collect and interpret data. The evaluation partners' involvement in the evaluation will enhance the trustworthiness of the evaluation findings. **Mixed Methods:** To fully capture the complexities of project implementation and outcomes in a cultural context (Frierson et al., 2010), both quantitative and qualitative data will be used.

Evaluation Plan: At the end of each semester, a Formative Evaluation will be conducted to provide timely feedback about what is working, what needs to be improved, and how it can be improved to the project staff. Questions to be asked include: To what extent is the project being conducted as planned? Are the target numbers of participants reached? To what extent the participants are making sufficient progress toward the intended outcomes? At the end of the project, a <u>Summative Evaluation</u> will be conducted to examine the extent to which the project achieves the intended outcomes. The findings will be interpreted within the project context. Questions include: (1) To what extent and how does the new MSL Model influence the intended student, parent, and mentor outcomes as well as the GPRA indicator? (2) To what extent and how does the parent training component of the MSL Model influence the intended student outcomes as comparing the intervention and control groups? (3) What factors (e.g., student grade level and free/reduced lunch rate, school's Title I status, and parents' educational level) differentiate the intervention effects and how? **Research Design.** To address those questions, a quasi-experimental study will be used. The intervention group will consist of 288 students from 4 public schools and 1 charter school, and the control group will consist of 288 students from 2 public schools, 1 charter school, and 2 Boys & Girls Club sites, recruited for 3 years. The intervention group will receive the full MSL Model while the control group will receive the MSL model without the parent workshops. The outcomes and measures are presented in Table 3.

Table 3. *Project Summative Evaluation Measures*

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Data Analysis: Multilevel analysis will be employed to analyze the quantitative, student outcome data, which are nested within parent or mentor data. The quantitative, parent pre-post data or mentor-pre-post data will be analyzed using linear mixed models. The qualitative data, collected from the survey essay questions or focus groups, will be analyzed using content analysis to find themes and patterns to answer the research questions.

Data Management: A Cloud-based system will be used to manage data and communicate the data collection status with the project staff on time.

Reporting of Evaluation Findings: A formative evaluation report will be made at the end of every semester to provide project quality and fidelity related information to project staff. A summative evaluation report will be made near the end of the 3-year grant period to provide project effectiveness related information and provided to the NHEP and project staff.

Utilization & Dissemination of Evaluation Findings: For active use and wide dissemination of the evaluation findings, the reports will be re-formatted appropriately. To inform project evaluation partners, participants, and stakeholders, important findings will be highlighted and included in semester-basis project newsletters. Then, for practitioners and researchers, academic publications in peer-reviewed journals (at least 3) and conference presentations (at least 4) will be made. All dissemination products will be posted on the project website, and the project will keep track of the numbers of downloads and inquirers to evaluate the extent of the product use.