A PROPOSAL FOR
HAWAIIAN LANGUAGE REVITALIZATION

Under the
Native Hawaiian Education Program
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United States of America Department of Education

# LAUPAʻI KA ʻIKE KUAMOʻO

## Hawaiian Language Multimedia Development Project (6-18)

Submitted By:

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(Part 4: Application Narrative)

## ABSOLUTE PRIORITIES

Serving 15 HL immersion middle and high schools with high percentages of Native Hawaiians (NHs), the project applicant, Ka Haka ʻUla o Keʻelikōlani (KHʻUOK) College of Hawaiian Language at the University of Hawaiʻi at Hilo proposes the Laupaʻi ka ʻIke Kuamoʻo Hawaiian Language Multimedia Development Project to increase access to Hawaiian language- and culture-based (HLCB) learning opportunities for 1,270 students in grades 6-18 at rural and urban school settings on five islands. The project addresses three of four absolute priorities, meeting needs: (1) of at-risk children and youth; (2) in fields or disciplines in which NHs are underemployed; and (3) for the use of the Hawaiian language (HL) in instruction.

## COMPETITIVE PREFERENCE PRIORITIES

### Priority 1 – Promoting STEM Education with a Focus on Computer Science

The project promotes STEM education through the development, piloting and dissemination of: (1) HLCB STEM curriculum units for grades 6-12; (2) HLCB STEM informational texts and associated leveling criteria by KHʻUOK's resource development unit, the Hale Kuamoʻo Hawaiian Language Center; and (3) the groundbreaking development of an online monolingual multimedia HL dictionary utilizing cutting edge database code and connecting interns to hands-on practical experience in linguistics and computer science. The overarching goal of this development work is to increase STEM achievement for at-risk NH students in the target grades by reinforcing the cultural relevancy of STEM, focusing on the computer science of HL perpetuation, and fostering STEM career readiness through a HLCB lens.

### Priority 2 – Fostering Flexible and Affordable Paths to Obtain Knowledge and Skills

Mentorships and internships will be offered by the Kuamoʻo Project (KP) for four of the above noted STEM and computer science-based project components: (1) the KP will offer

internships with linguist, Kepano Trussel, to students interested in helping develop the world's first online monolingual multimedia HL dictionary incorporating audio, graphic, and video media. Trussel (resume attached) is eager to share his lifetime of experience as a language advocate and coder while passing on skills and knowledge related to preserving languages through dictionary technology work; (2) Dr. Larry Kimura and others on the Kani‘āina project team will offer flexible work based learning experiences and interactive learning experiences at high school bridge courses to engage students in the ongoing development, crowdsourcing, and web posting via a searchable index, of native speakers of HL; (3) Bob Stauffer, Ph.D., a practiced historian and digital archivist who manages KH‘UOK's Ulukau digital clearinghouse of electronic HL and cultural resources, which has received over 180 million visits to date, will offer internships to college students who will help in the dissemination of the project and other Hawaiian materials through the Ulukau platform; (4) graduate students in KH‘UOK's Kahuwaiola Indigenous Teacher Education Program will participate with mentors in work based learning experiences in informational book pilot testing. This strand of mentorship is anticipated to have critical long-term impacts by producing well-prepared HL immersion teachers, in a industry where a critical teacher shortage was designated last year by the USDOE (see May 2019 letter from HIDOE Superintendent in the appendix). Participants will also gain valuable hands- and minds-on experiences in tech, develop real-world STEM knowledge and skills, and benefit from useful relationships with seasoned professionals in the HLCB education and information science sectors. Flexible learning paths that combine STEM and "Cultural Activities" align with in-demand industry sectors where NHs are underrepresented in the current economic climate of Hawai‘i (see Li, 2019, on page 5).

## SELECTION CRITERIA

### Section A – Need for the Kuamoʻo Project

### MAGNITUDE OF THE NEED FOR PROJECT SERVICES AND ACTIVITIES

Native Hawaiians are underrepresented and at-risk for underachievement in STEM fields. According to the 2019 Native Hawaiian Data Book, NHs in Hawaiʻi occupied only 1.8% of information science sector jobs and 10% of positions in other STEM-related industries despite representing 29% of the population. The state averages for high school students meeting academic standards for math and science respectively are 43% and 44%. In contrast, Table 1 below shows average achievement of only 23% and 32% respectively in these content areas by KP partner school students. The 2015 Nation's Report Card ranked Hawaiʻi fifth from the bottom of states whose students met or exceeded standards in science, underscoring a general at-risk status for the STEM readiness students in Hawaiʻi hindering progress for NHs along with all other groups. Table 1 also documents a high rate of socioeconomic challenge for families of students served by this project (61% receive free and reduced lunch at school).

These challenging STEM career, STEM achievement, and SES statistics are rooted in and compounded by underrepresentation of NHs in college attendance and graduation. In 2017 in Hawaiʻi, only 12% of Native Hawaiians and other Pacific Islanders held at least a bachelor's degree compared to 22% of the entire population; only 5% held a graduate or professional degree compared to 11% of the entire population (Native Hawaiian Data Book, 2019).

Widespread community-identified need for this project is emphasized in attached letters of support from the Office of Hawaiian Affairs, the ʻ Aha Kauleo Advisory Board for HM Schools to the HIDOE superintendent, and the Kanaeokana HLCB Schools Network.

**Table 1: Laupaʻi ka ʻIke Kuamoʻo Project – Students and Schools to be Served**

| | | | SES Characteristics and STRIVE HI Proficiency Statistics (2018-2019) | | |
|---|---|---|---|---|---|
| **Hawaiian Language Medium (HM) Schools to be Served** | **Island** | **Students Served** | **% Free and Reduced Lunch Rate** | **% Proficient Math** | **% Proficient Science** |
| **Nāwahīokalaniʻōpuʻu (6-12)*** | Hawaiʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **Ka ʻUmeke (6-12)*** | Hawaiʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **ʻEhunuikaimalino (6-12)*** | Hawaiʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **Kamakau (6-12)*** | Oʻahu | [redacted] | [redacted] | [redacted] | [redacted] |
| **Kawaikini (6-12)*** | Kauaʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **Ke Kula Niʻihau o Kekaha (6-12)*** | Kauaʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **ʻAlo Kēhau o ka ʻĀina Mauna (6-9)** | Hawaiʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **Kekaulike (9-12) & Kalama (6-8)** | Maui | [redacted] | [redacted] | [redacted] | [redacted] |
| **Lahainaluna (9-12) & Lahaina (6-8)** | Maui | [redacted] | [redacted] | [redacted] | [redacted] |
| **Hina i ka Malama (7-12)** | Molokaʻi | [redacted] | [redacted] | [redacted] | [redacted] |
| **Pūʻōhala (7-8)** | Oʻahu | [redacted] | [redacted] | [redacted] | [redacted] |
| **Kahuku (9-12)** | Oʻahu | [redacted] | [redacted] | [redacted] | [redacted] |
| **Ānuenue (6-12)** | Oʻahu | [redacted] | [redacted] | [redacted] | [redacted] |
| **LAB /PILOT HM SCHOOLS TOTAL (6-12)** | | **570** | **61** | **23** | **32** |
| **OTHER 6-12 HM SCHOOLS TOTAL (6-12)** | | **620** | **AVERAGE (%)** | | |
| **UH HILO KHʻUOK COLLEGE OF HAWAIIAN LANGUAGE (10-16)** | | **80** | | | |
| **GRAND TOTAL** | | **1,270** | | | |

* Indicates laboratory and other schools involved in resource piloting and STEM learning opportunities.

All of the above figures and community input reflect a pressing and immediate magnitude of need for the Laupaʻi ka ʻ Ike Kuamoʻo Project. Meaning literally "Expanding Access to Ancestral Knowing", Laupaʻi ka ʻIke Kuamoʻo (hereafter the Kuamoʻo Project or KP) will remedy this urgent need by strengthening STEM education for HL medium schools at the middle, secondary, and tertiary levels; developing culture-grounded "bridge" coursework to

facilitate and ease the transition from high school to college; and providing work-related HLCB learning experiences in STEM fields connecting youth with seasoned STEM indigenous language professionals to increase comfort levels and relevancy of advanced STEM content.

The multifaceted needs and problems described above meet with vast opportunity in current economic conditions in Hawai‘i. A recent Hawai‘i Department of Business Economic Development and Tourism report shed light on the availability of jobs in various industry sectors in the state. “Cultural Activities” was noted as a “base growth industry” in Hawai‘i with 365% of the job potential compared to other U.S. states (Li, 2019). The Kuamo‘o Project’s framing of STEM computer science as a culture-grounded professional pursuit prepares students for work life in a high-tech 21st Century Hawai‘i work environment and “knowledge economy” where cultural knowledge and skill sets are in-demand job market assets.

**SERVICE, OPPORTUNITY, AND INFRASTRUCTURE GAPS AND WEAKNESSES**

A convening at the University of Hawai‘i at Mānoa of indigenous science teachers and education policymakers from Hawai‘i and throughout the Pacific resulted in the “Mānoa STEM Report: Recognizing and removing barriers to STEM careers for Native Hawaiians and Pacific Islanders” (Hadfield, Hess & Smith, 2016). Below is a list of the some of the key findings and recommendations of this multi-day work group symposium:

- Frame pre-college science and math courses within the appropriate cultural context.
- Provide middle and high school science teachers with professional development that integrates local history, culture and language into science and math courses.
- To reduce barriers to STEM training and careers: “Most especially, support programs that provide financial assistance for mentorships in research-educational centers.”

The Kuamoʻo Project incorporates all of the above in addition to addressing the following gaps and weaknesses through associated remedies and learning opportunities:

**Service Gap:** The Mānoa STEM report noted comments from several panelists that "if a student's interest in science is not captured before she or he enters college, it is too late."

**KP Remedy:** Culturally relevant books, curricula and experiences are developed, piloted, and optimized to boost interest and relevancy for grade 6 to 12. The project resources, work based learning experiences, and high-school-to-college bridge coursework focus on connecting STEM, especially computer science, to the perpetuation of Hawaiian language and culture, providing a relevant high-interest practical context of learning for HM students. This also addresses another key recommendation of the report: "Connect college STEM courses to careers other than the traditional medical, engineering or academic pathways."

**Opportunity Gap:** During the early years in the 1970s and 1980s when the current HL revitalization movement was getting off the ground, HL leaders were guided by a strong community of mānaleo (native speakers) who served as models of native-like fluency. In the decades since then, almost all of these mānaleo speakers have passed away. The current generation does not have access to this kind of community-based expert HL support.

**KP Opportunity:** By providing learning experiences in and expanding access to the online Kaniʻāina database of native HL speakers, the KP will deepen familiarity of younger generations with this priceless resource of digitized voice files, indices, and transcription documents. Through crowdsourcing of transcriptions, HL students gain intimate access to high level Hawaiian language. Students will be mentored by Larry Kimura, recently named a "living treasure" of Hawaiʻi who conducted radio interviews in the 1970s and 1980s with the

mānaleo whose voices are now preserved in the Kani‘āina repository. The production of an online multimedia monolingual HL dictionary will further build native-like language skills as participants develop vocabulary and HL thinking skills in addition to learning about the technological aspects of these platforms that allow them to be shared with a global audience.

**Service Gap:** Less than one third (32%) of NHs in Hawai‘i who enter college complete a four year degree or higher (UH, 2018). **KP Remedy:** In a recent bivariate analysis of a large scale study of schools where culture-based education (CBE) is implemented with varying levels of intensity, it was found that students with high-intensity CBE teachers were significantly more likely to graduate college (Kana‘iaupuni, Ledward & Malone, 2017). The KP builds on CBE assets by providing work based learning experiences, curriculum, books, and teacher training all of which are intensely focused through HL medium on CBE.

**Infrastructure Weakness:** Although the HL revitalization movement is growing, with more speakers and more learners each year, the HL is still classified as “severely endangered” by the Endangered Language Project (ELP). Few native or native-like speakers of HL remain, and, the ELP report notes, “L2 speakers in general are not as competent or fluent in the language as L1s.” **KP Opportunity:** Acutely aware of this situation, KH‘UOK, has designed multiple contexts within the objectives and activities of the Laupa‘i ka ‘Ike Kuamo‘o project for students in grades 6-18 to rise to higher levels of HL fluency through interaction with fluent teachers, mentors, digitized native speaker voice recordings, and by helping develop the technological infrastructure to share these resources with growing circles of HL learners. This is one essence of the project title, “Expanding Access to Ancestral Knowing”, as a time-

tested approach to restoring Hawaiian identity and high levels of HL fluency. Other specifics of achieving this overarching project goal are described in the following section.

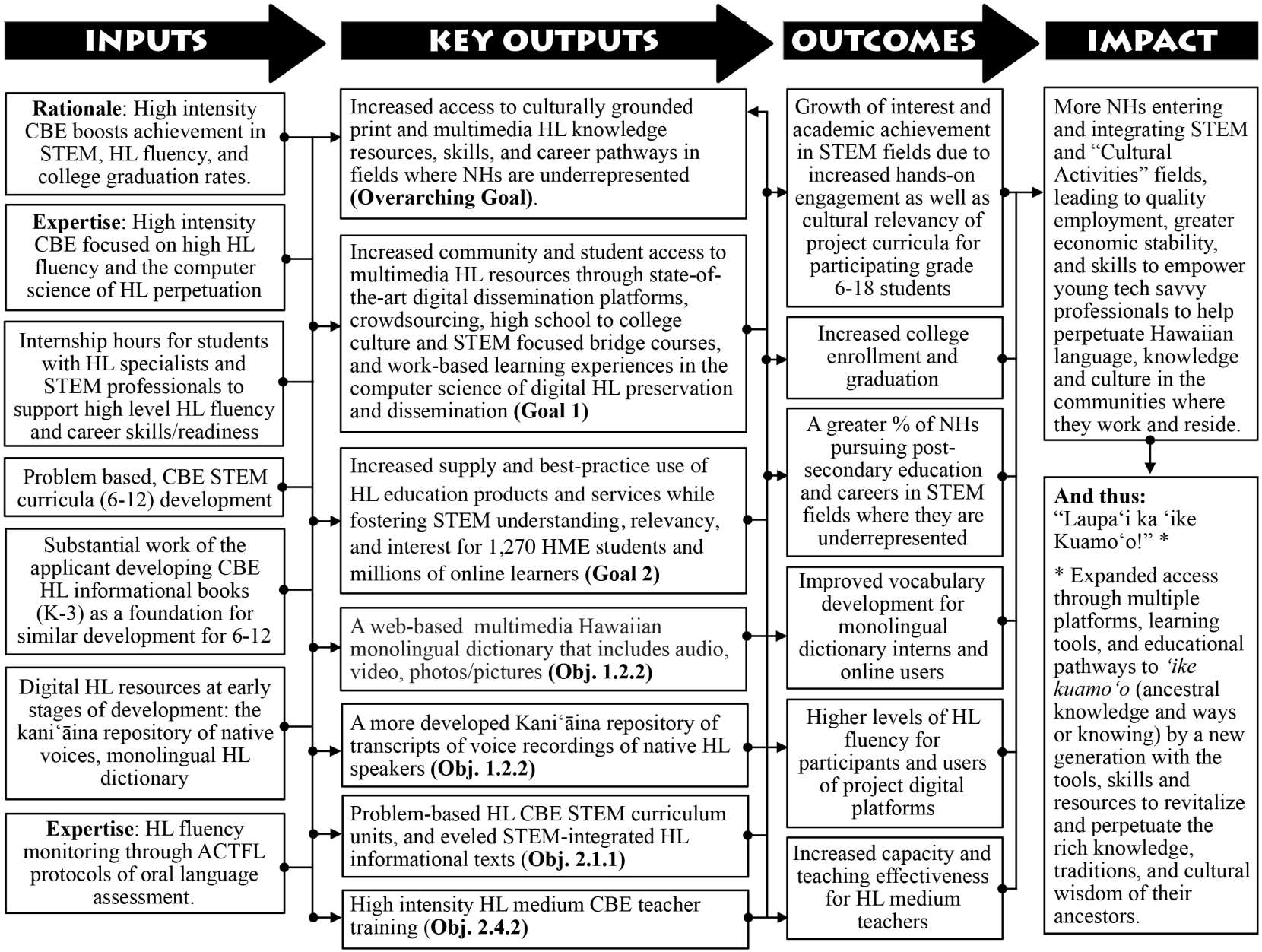
**Section B – Quality of the Project Design**

**PROJECT RATIONALE**

The Laupaʻi ka ʻIke Kuamoʻo Project, was built on a wealth of contemporary research establishing the power and efficacy of CBE to transform education and educational outcomes for NH students (Demmert, 2011). This literature includes scholarly work on the transformative power of indigenous culture education for science (Aikenhead, 2006; Chinn, 2006, 2008; Kawagley & Barnhardt, 1999) and math (Kukahiko, 2014) achievement by indigenous students. In preparing their 2012 book chapter, "Access and Success for Students from Indigenous Populations: The Case of Native Hawaiians and Higher Education," Thomas, Kanaʻiapuni, Balutski, and Freitas interviewed a number of NH undergraduate students to discover what barriers they encountered in their college experience, and how they overcame those barriers. An important finding, and common experience of many NHs who were able to persist and pursue graduation and graduate studies is that program relevance was crucial in "defining the significance, relevance, and justification for generations of Hawaiian family practices and lifestyles" (p. 363). This is exactly what the "kuamoʻo" in the project name connotes: a genealogical cultural connection to knowledge and learning, and to learning and knowing what matters from a cultural lens.

Cultural, HL, and kuamoʻo relevance are built into each facet of the Kuamoʻo Project, increasing the statistical likelihood that planned project outcomes will be realized and significantly improved (Kanaʻiaupuni, Ledward & Malone, 2017). This project rationale is

# Diagram I: Laupa‘i ka ‘Ike Kuamo‘o Project Logic Model

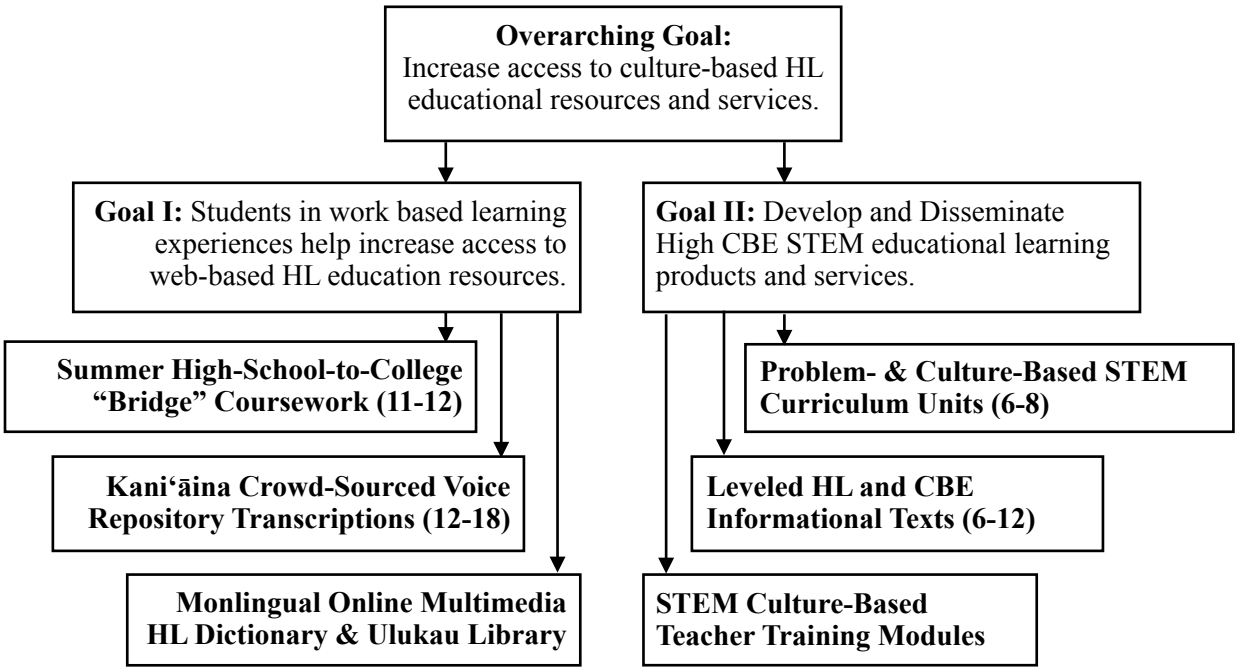



Laupa‘i ka ‘Ike Kuamo‘o HL Multimedia Project (6-18)

grounded in three decades of language revitalization work by KH‘UOK college and it’s flagship K-12 laboratory School, Nāwahīokalani‘ōpu‘u. A longitudinal study by the KP Principal Investigator followed a new teacher at Nāwahīokalani‘ōpu‘u who, over the course of 14 years of teaching growth, came to the following conclusion: “Cultural values should be embedded throughout the learning environment and across the curriculum in a way that fosters positive cultural identity and school success” (p. 94, Kawai‘ae‘a, Kawagley & Masaoka, 2017). This approach aligns with the findings of the Mānoa STEM Report discussed on page 5, and is the foundation of the KP project design. The logic model (Diagram I) depicts key project components, interactions of “active ingredients” and resultant outcomes and impact.

## APPROPRIATENESS OF PROJECT DESIGN TO ADDRESS THE IDENTIFIED NEEDS

DIAGRAM II:
**TWO-PRONGED KUAMO‘O PROJECT DESIGN**




The overarching goal of the Kuamo‘o Project is to increase access to HLCB print and multimedia knowledge resources, skills, and career pathways in fields where NHs are

underrepresented. This will be accomplished through an innovative two-pronged "Kuamoʻo" project design (Diagram II) facilitating practical hands-on experiences in culture-grounded STEM education and the computer science of language preservation through: (1) Introductory summer intensive bridge coursework and work based learning experiences for grades 12-18, and (2) Curriculum resources, leveled informational texts, evaluation services, and teacher preservice and inservice training for grades 6-18. These twin project goals are designed to pass knowledge and career skills from a cohort of seasoned educators and professionals to a new generation of HL speakers resulting in increased HL proficiency, STEM achievement, and tech sector job skills for 1,270 predominantly Native Hawaiian Hawaiian medium (HM) students in grades 6-18.

This project design addresses the following needs of the target population: **Need I** – Services to recruit and retain NH secondary students entering tertiary educational settings and encourage STEM studies (bridge coursework, STEM HL work based learning experiences and mentors); **Need II** – Supports for at-risk low SES NH 6-12 students with lower than average STEM achievement (HLCB curricula, leveled HLCB books, HLCB teacher training); **Need III** – Training for teachers to increase HLCB STEM in their teaching (providing middle and high school science teachers with professional development integrating local history, culture and language into science and math courses); **Need IV –** Educational resources to build high level HL fluency for L2 HL students (internships and apprenticeships, online HL resources, technology infrastructure); **Need V** – Increased access for 1,270 HL medium students as well as a growing world-wide population of HL learners to state-of-the-art HLCB digital learning resources (the Kaniʻāina voice repository, monolingual online multimedia dictionary, Ulukau digital HL resource library). Through these products and services—further elucidated in the logic model and the objectives and activities of the following section—the KP will expanded access

through multiple platforms, learning tools, and educational pathways to ʻIke Kuamoʻo (ancestral knowledge and ways or knowing) for a new generation with the technology tools, skills and resources to revitalize the rich knowledge, traditions, and cultural wisdom of their ancestors.

**Section C – Quality of Project Services**

**ENSURING EQUAL ACCESS FOR PROJECT PARTICIPANTS**

The Kuamoʻo Project will serve 1,270 HL medium students in grades six to 18 (graduate level teacher trainees). Collaborating with its laboratory school partners during the development phase to pilot and revise products and services, KHʻUOK will then equally distribute finalized curriculum and informational resources to all project partners on 5 islands. While some services — internships, apprenticeships, bridge coursework — are more readily accessible to partners within the geographic vicinity of the KHʻUOK campus, these geographic barriers to participation by students without easy access to the UH Hilo campus will be addressed as follows:

- Accessibility is a central premise of the KP. Online platforms and distance learning opportunities facilitate greater access by all, including NHs affected by the diaspora.
- The project's focus on HLCB STEM supports increases access to STEM knowledge, skills, and career pathways by groups traditionally underrepresented in these domains.
- Bridge coursework for high school students is offered during the summer and announced to all high school partner schools with the project paying for travel and lodging costs.
- Work-related learning experiences will be offered both in-person and via distance learning platforms, and will take advantage of several mentors living on the island of Oʻahu where a large population of middle and high school HL medium students will have the opportunity to engage in these valuable learning experiences.

Goal 2 of the KP was specifically designed to meet the STEM and literacy learning needs of at-risk HL medium learners in grades 6-12 while also addressing needs in fields where NHs are underrepresented. This ambitious agenda is efficiently achieved through the development of leveled HLCB informational reading sets, and providing training to the teachers of grade 6-12 HL medium learners to promote best practices in informational reading support. This approach to literacy instruction involves efficient use of leveled books to tailor reading instruction to the specific instructional needs of individual learners, and is grounded in an exhaustive review of recent research on text leveling as an approach to more effective instructional supports for the reading development of a spectrum of readers. These strategies help foster equal access to traditionally underrepresented groups, including those with learning disabilities. Hale Kuamoʻo's research in this area owes much to the seminal work of Fountas and Pinnell on the use of leveled texts for individualized reading instruction (Fountas & Pinnel, 2007). KHʻUOK and UH Hilo have a policy of non-discrimination by race, color, national origin, gender, age, or disability.

**SERVICES REFLECT UP-TO-DATE KNOWLEDGE OF EFFECTIVE PRACTICES**

Grounded in contemporary NH educational research (see pages 8-10), implementation, and evaluation best-practices, the Laupaʻi ka ʻIke Kuamoʻo project builds on more than 30 years of HL educational development and cutting edge international indigenous language revitalization work of Ka Haka ʻUla o Keʻelikōlani (KHʻUOK) College of Hawaiian Language at the UH Hilo.

The project will develop, pilot, and improve Hawaiian medium (HM) education learning resources and services at six laboratory and pilot school sites serving 570 grade 6-12 students before scaling to an additional nine school sites serving 620 HM students (Table 1, page 4). By project end, Laupaʻi ka ʻIke Kuamoʻo will serve a total of 1,270 students in grades 6-18. The

project's innovative design incorporates multiple contexts for the transmission of knowledge from seasoned HL and culture educators and STEM experts to a new generation of HL users.

**Overarching Project Goal:** To increase access to culturally grounded print and multimedia HL knowledge resources, skills, and career pathways in fields where NHs are underrepresented, through an innovative two-pronged "Kuamoʻo" process facilitating practical hands-on experiences in HLCB STEM education and the computer science of language preservation.

This broad goal will be accomplished through: (1) the coordination of introductory summer and online bridge coursework and work based learning experiences for grades 12-18, and (2) the development of curriculum resources, leveled informational texts, evaluation services, and teacher training for grades 6-18. Both of these project implementation goals, and the associated objectives and activities presented below, are designed to pass knowledge and career skills to a new generation of HL speakers resulting in increased language fluency and tech sector job skills for 1,270 predominantly Native Hawaiian HM students in grades 6-18.

**Goal 1:** Increase community and student access to critical multimedia HL resources by engaging HM students in creating and utilizing state-of-the-art digital dissemination platforms through crowdsourcing, culture- and STEM-focused college bridge courses, and work based learning experiences in the computer science of digital HL preservation and dissemination to foster technology skills, career readiness, and advanced HL fluency for 80 grade 12-18 students as well as millions of online HL learners of all ages.

**Objective 1.1** – Develop online and face-to-face introductory college bridge coursework, and enrichment resources for 80 or more grade 12-18 students at KH‘UOK and partner laboratory and pilot schools to be hosted at the Hale‘ōlelo campus of KH‘UOK.

- **Activity 1.1.1** – From months 3-12, develop high school to college online and face-to-face introductory bridge courses, enrichment experiences, and student technology workforce development teacher training to advance HL infrastructure and STEM skills through crowdsourcing and database platforms.

- **Activity 1.1.2** – From month 13 to 21, train KH‘UOK staff and STEM college partners in the content and effective delivery of coursework designed in activity 1.1.1, utilizing college and community STEM partnerships to strengthen the culture-based HM STEM education capacity at KH‘UOK.
- **Activity 1.1.3** – During months 22-36, pilot and implement college bridgework programs with laboratory schools and other HM high school partners.

Research on the efficacy of college bridge programs finds that effective programs do the following: (1) cultivate strong relationships with partner schools, (2) provide professional development to all program staff, (3) conduct preprogram orientation sessions and closing ceremonies; (4) provide academic advising and other support services; and (5) implement both formative and summative evaluation methods (Kallison & Stader, 2012). Each of these recommendations will be incorporated into the design, implementation and evaluation of KP bridge programming.

College level coursework, including high school bridge courses for grade 12 students will include a summer intensive “Leo Ola” course building on the work of senior professor, Dr. Larry Kimura, who had the foresight from 1972 to 1988 to record on reel-to-reel tapes more than 400 live broadcast interviews and 550 hours of live discussions that he conducted with mānaleo (native speakers of Hawaiian language) on the Ka Leo Hawai‘i radio program. As the mānaleo population has dwindled in recent years to only a few remaining speakers, these recordings of fluent speakers of Hawaiian with authentic STEM insights from a unique NH cultural lens, have proven invaluable to Hawaiian language learners from all walks of life, and have been digitized and made available online as the Kani‘āina database. The Kuamo‘o project will involve grade 12-18 students in hands- and minds-on learning experiences with Kimura—recently named a “living treasure” of Hawai‘i—and tech specialists of the Kani‘āina project development team who will share knowledge and skills of archiving, transcription, OCR, digitization, database development and maintenance, crowdsourcing, and social media marketing involved with bringing this free resource to an expanding global community of Hawaiian language learners.

**Objective 1.2** – Coordinate work based learning experiences for 10-20 students who will participate with language, cultural, and technology specialists in the development of the world’s first online multimedia monolingual HL dictionary, and the further development through crowdsourcing of the Kani‘āina oral language repository of native speakers of Hawaiian, the products of which will be posted to KH‘UOK’s Ulukau digital library platform leading to increased STEM career readiness for student participants and increased access to HL resources for online language learners.

- **Activity 1.2.1** – Develop, expand and enhance a multimedia Hawaiian monolingual dictionary that includes audio, video, photos and other graphics.
- **Activity 1.2.2** – Develop a system of crowdsourcing transcriptions for the Kani‘āina native Hawaiian speaker audio database, engaging grade 10-15 students in the design, implementation, and enhancement of this system.
- **Activity 1.2.3** – Establish work based learning opportunities for 10-20 students across the above projects to engage undergraduate and high school students with experts in information technology and HL and culture.
- **Activity 1.2.4** – Train student assistants and staff at the college’s Hale Kuamo‘o Hawaiian Language Center unit in the further development of the Ulukau internet dissemination platform.
- **Activity 1.2.5** – Newly trained staff, student interns, and others disseminate project products and resources and increase library collections on the Ulukau.

In their “Handbook for Work Based Learning”, Cunningham, Dawes, and Bennett (2016) note that knowledge gained at work and through work plays an increasingly important role in modern times so that work based learning is central to “a paradigm shift from an ‘industrial society’ to a ‘knowledge society’” (p. vii). From a Hawaiian cultural lens, this modern insight is also ancient as a well known proverb suggests: Ma ka hana ka ‘ike (“From doing comes knowing”). The KP prepares students for this “ma ka hana ka ‘ike” reality of 21st Century work and workplaces through an application process that pairs interested students with experts in culture and information technology with a focus on language perpetuation through IT software

and infrastructure. Thus, relevancy is reinforced through both mentor-modeling and a social purpose in technology applications.

**Goal 2:** Integrate STEM and Hawaiian knowledge in the creation of digital and print educational resources — curriculum units, leveled grade 6-18 culture-based texts, evaluation services, and pre- and inservice teacher training modules — to increase the supply and best-practice use of HL education products and services while fostering STEM understanding, relevancy, and interest for 1,270 HM students and millions of online learners by project end.

**Objective 2.1** – Develop, pilot, and disseminate 14 problem-based culturally relevant HL STEM curriculum units to teachers and schools serving 1,270 HLIP grade 6-12 students.

- **Activity 2.1.1** – Develop 12 STEM problem-based culturally relevant curriculum units and support materials for grades 6-12 in collaboration with lab school teachers and university STEM content specialists.
- **Activity 2.1.2** – Coordinate internships/mentorships/apprenticeships and coursework for KH‘UOK Kahuawaiola indigenous teacher education program graduate students to build their capacity to engage in HLCB curriculum development, piloting, assessment, and revision of resources while completing student teaching requirements.
- **Activity 2.1.3** – Pilot, and revise 14 problem-based culturally relevant HL STEM curriculum units at lab and partner schools, including 2-6 graduate HM education student teachers in the piloting process as a work based learning and mentorship experience.
- **Activity 2.1.4** – Create, enhance, and support preservice and inservice curriculum training opportunities featuring culturally relevant STEM curriculum and best-practice teaching methodologies for grades 6-12.

The KP benefits from the knowledge expertise present in the UH Hilo learning community where support in science and math content development for these curriculum units has been formalized in letters of support from ʻImiloa Astronomy Center, the College of Tropical Agriculture, and a Department of Mathematics professor fluent in the HL (see the appendix).

**Objective 2.2** – Adapt and develop a grade 6-12 continuum of HL-based text characteristics criteria to guide development of leveled STEM and other informational books for these grades.

- **Activity 2.2.1** – Convene a development team of college specialists on the ACTFL criteria as applied to the HL (function, text, context, accuracy), middle and secondary HM educators, and community partners, to develop a HL matrix of leveled text characteristics for advancing HL literacy skills at the middle and secondary levels.

This careful leveling of literacy materials provides instructional supports for HM teachers to address the specific developmental literacy needs of individual readers, and provides learning supports for all project beneficiaries, but especially for at-risk early learners experiencing difficulty learning to read. The reading of nonfiction informational texts is associated, especially when accompanied by teaching focused on cultivating strong comprehension and analysis skills, with student success in K-12 education and college (Goodwin & Miller, 2013).

**Objective 2.3** – Utilize the leveled text characteristics continuum from Objective 2.2 in the development of two sets of 7 leveled HLCB informational texts to foster increased HL language fluency in the domain of content-specific HL terminology for grade 6-18 HM students.

- **Activity 2.3.1** – Develop two sets of 7 short HLCB informational text resources (6-12 pages per text) integrating Hawaiian knowledge, culture, math and science and associated curriculum and support materials for grades 6-12.

- **Activity 2.3.2** – Test pilot leveled HL books, curriculum and support materials for grades 6-12 through collaboration with partnering lab and pilot schools.
- **Activity 2.3.3** – Coordinate substantive work based leaning involvement and participation of Kahuawaiola graduate level HM student teachers in 2.3.2 pilot work.
- **Activity 2.3.4** – Revise and publish informational books, incorporating pilot feedback.

Support for the piloting of draft curriculum and books, and for the KP project in general, is expressed in letters of support from the Hawai‘i Charter School Commision, KH‘UOK’s four lab schools where piloting will take place: Nāwahī (Hawai‘i), Kamakau (O‘ahu), Kawaikini and Ke Kula Ni‘ihau o Kekaha (Kaua‘i); two pilot schools, Ka ‘Umeke Kā‘eo (Hilo) and ‘Ehunuikaimalino (Kona); and the two Complex Area Superintendents representing Nāwahī in Puna and ‘Ehunuikaimalino in Kona. The entire KP application was provided for comment to the HIDOE P.I.P.E. Branch. Letters from all of the above are provided in the appendix.

**Objective 2.4** – Disseminate all project digital and print resources to schools and teachers serving 1,270 HL medium students through inservice and preservice professional development learning opportunities for grades 6-18 HM teachers.

- **Activity 2.4.1** – Disseminate math and science problem-based culturally relevant curriculum, books and support materials for grades 6-12.
- **Activity 2.4.2** – Provide inservice and pre-service teacher training opportunities for delivery of grade 6-12 math and science problem-based culturally relevant curriculum.
- **Activity 2.4.3** – Engage student interns in posting project and other HL resources on the Ulukau digital dissemination platform to increase access to these resources.

**IMPACT OF SERVICES ON THE INTENDED RECIPIENTS**

Major planned project impacts include: (1) Increased HLCB STEM competencies for grade 6-18 HM students; (2) Increased capacity of HM teachers, including preserve teachers, to plan and conduct problem-based HLCB STEM-integrated lessons and instructional units; (3) Growth of career readiness for in-demand STEM sectors where NHs are underrepresented; and (4) Access for the entire target population as well as a growing global community of HL learners to state-of-the-art online educational resources. A timeline for KP implementation detailing impacts by objective and activity with related measures is presented in Table 2 on pages 26-28.

**Section D – Quality of Project Personnel**

**ENCOURAGES APPLICATIONS FROM UNDERREPRESENTED GROUPS**

Although the number is growing, Native Hawaiians in particular are still underrepresented in the field of education. Therefore, the administrators of KH‘UOK encourage and actively seek applications for employment from persons who are members of groups that have traditionally been underrepresented based on race, color, national origin, gender, age, or disability. In particular, NHs who are proficient in the Hawaiian language are encouraged to apply. Following you will find the personnel KH‘UOK intends to hire based on high levels of expertise and qualifications. Therefore, the grant currently proposes the hiring of six NHs and one caucasian. While not discriminating on the basis of race, color, national origin, gender, age or disability, we encourage NHs who are proficient in Hawaiian to apply.

**QUALIFICATIONS OF KEY PROJECT PERSONNEL**

The organization chart on page 25 depicts leadership, project management and the specialized staff responsibilities of the Kuamo‘o Project. Staff members and faculty of KH‘UOK

are uniquely qualified, prepared, and positioned to carry out this program development. KH‘UOK has more than 30 years experience and leadership in HM P-20 program development, Hawaiian curriculum development, linguistics, literature, culture and evaluation. The personnel of this project will play a key role in its success. Staff members not only need to be highly qualified in their field of content and delivery, but each member of the staff also needs to be highly proficient in the HL as all project communications and services will be in the HL and all materials will be developed in the HL. Resumes of key staff are appended.

The **Principal Investigator** of this project is [redacted] Director of KH‘UOK at the University of Hawai‘i at Hilo. She is responsible for the preservice and inservice education of numerous HM teachers. She exudes the breadth and depth of HM education with 30 years of varied school experiences as a teacher, professor, researcher, writer, curriculum developer, administrator and project manager. [redacted] is the author of numerous scholarly articles on the Hawaiian language revitalization effort, Hawaiian academic and cultural proficiency standards, and distinctive teaching methodologies in HM education. Her leadership and oversight of the project is at .10 FTE contributed in-kind.

[redacted]

[redacted]

[redacted]

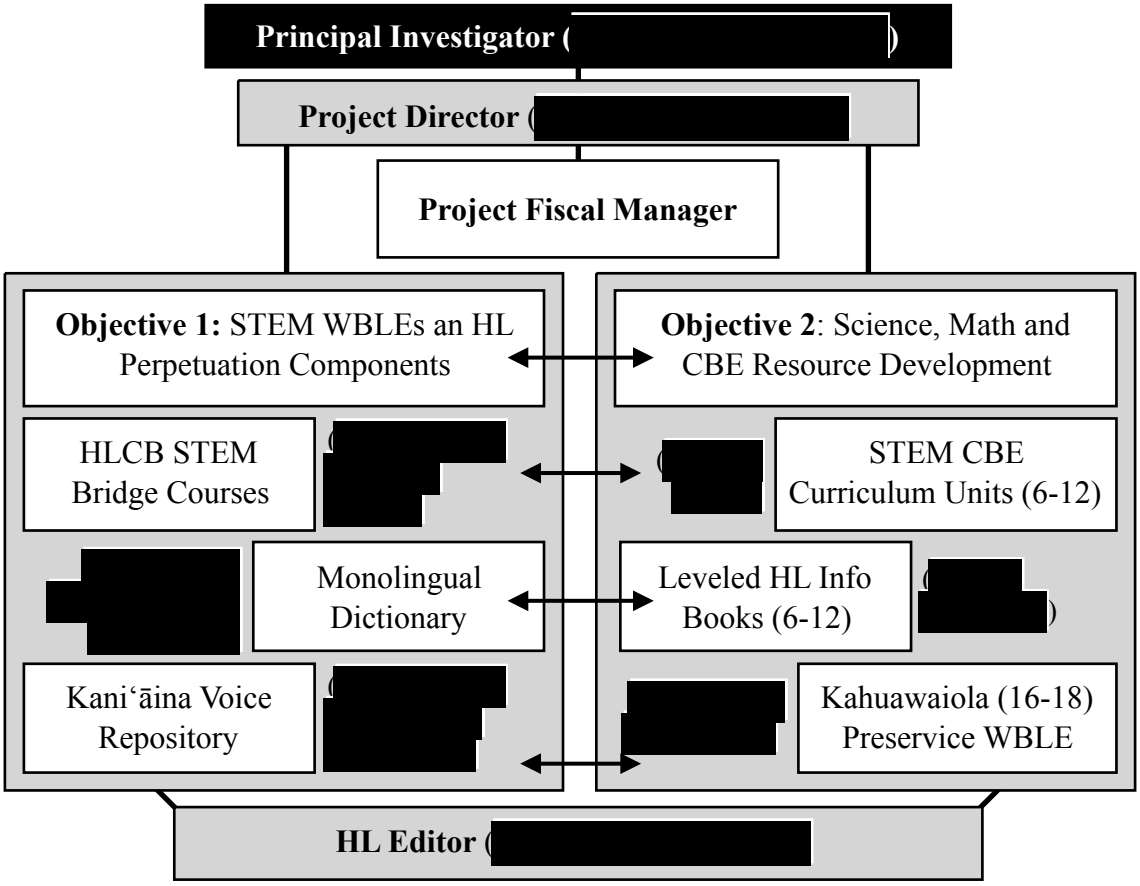
**Section E – Quality of the Management Plan**

**ACHIEVEMENT OF OBJECTIVES ON-TIME AND WITHIN BUDGET**

Primary responsibility for ensuring on-time and within budget project implementation is with the Project Director who confers regularly with the PI and is assisted by the Project Fiscal Manager. There are four Unit Coordinators leading the four major service units – Student Internship and Bridge Coursework, Curriculum Development, Book Development, and Preservice Teacher Involvement. Each Unit Coordinator will be responsible for managing and

supervising the activities of their units, implementing assessments, and contributing to related reports. Training and evaluation at the schools and for summer bridge course work will involve all units who will work with the PD and PI. Consolidated training schedules will address multiple topics to make effective use of time and project funds. As possible, PD credits for training or university credits will provide salary movement for HM teacher participants.

**DIAGRAM III: LAUPA'I KA 'IKE KUAMO'O PROJECT ORGANIZATION**




To guide project implementation and management, a timeline of services, milestones (by month), connections between services, impacts and multimethod evaluation instruments is presented in Table 2 below (QL=Qualitative, QN = Quantitative).

| Table 2 - Project Timeline, Impact, and Qualitative/Quantitative Measures | | |
|---|---|---|
| **Activities / Milestones** | **Timeline** | **Impacts / Evaluation Strategies** |
| **Objective 1.1 - Develop high-school-to-college bridge coursework.** | | |
| 1.1.1 - Develop bridge coursework | Months 3-12 | **QL** - small group pilots, focus group discussions |
| 1.1.2 - Train staff and partners | Months 13-21 | **QL** - training feedback forms for continual improvement; **QN** - # teachers trained, Likert Scale feedback |
| 1.1.3 - Implement bridge coursework | Months 22-36 | **IMPACT:** More positive dispositions (attitudes, beliefs, behaviors) towards college attendance leading to increased college attendance and success. **QL** - pre/post feedback forms for students and mentors; **QN** - # participants, # new enrollments at KHʻUOK and other college programs |
| **Objective 1.2 - Coordinate work based learning experiences (WBLE).** | | |
| 1.2.1 - Develop work based learning experiences (WBLEs) for the online multimedia monolingual HL dictionary | Months 1-3: planning Months 4-32: WBLE implementation | **IMPACT:** Systemic growth of vocabulary development in HM education; Career skills for WBLE participants; **QL** - small group pilots, focus groups, mentor eval forms, mentee reflections; **QN** - # of participants, participation hours (logs) |
| 1.2.2 - Plan WBLEs for crowdsourcing transcriptions for the Kaniʻāina native HL voice database. | Months 1-6: planning Months 7-32: WBLE implementation | **IMPACT:** Systemic growth of more native like language proficiency in HM education; Career skills for WBLE participants; **QL** - small group pilots, focus groups, mentor eval forms, mentee reflections; **QN** - # of participants, participation hours (logs), ACTFL oral language assessment |
| 1.2.3 - Establish and announce WBLE opportunities for the above projects to all partner schools. | As noted above for "WBLE implementation" for each project | **Impact:** Equal access to WBLEs in monolingual dictionary and Kaniʻāina work; Career skills for WBLE participants |
| 1.2.4 - Train student assistants in WBLEs to further develop the Ulukau internet dissemination platform. | Months 1-12: planning and training; Months 4-32: WBLE implementation | **Impact:** Increased access of HM educators and the public to HL digital resources; Career skills for WBLE participants; **QL** - small group pilots, focus groups, mentor eval forms, mentee reflections; **QN** - # of participants, participation hours (logs) |
| 1.2.5 - Disseminate all project products and resources via Ulukau | Months 13-36 | **Impact:** Increased access of HM educators and the public to HL digital resources; **QN** - # resources distributed; # of visits to Ulukau |

| Table 2 - Project Timeline, Impact, and Qualitative/Quantitative Measures | | |
|---|---|---|
| **Activities / Milestones** | **Timeline** | **Impacts / Evaluation Strategies** |
| **Objective 2.1 - Develop14 problem-based HL STEM curriculum units (HLSCU)** | | |
| 2.1.1 - Develop HL STEM curriculum units (HLSCUs) in collaboration with lab school partner teachers and university Math and Science experts. | Months 2-18 | **Impact:** Exchange of STEM and HLCB ideas between collaborating developers; **QN** - # of teacher / student teacher participants; **QL** - CBE, HL, STEM content and problem-based quality of HLSCU (Formative Rubric) |
| 2.1.2 - Pilot and revise 14 HLSCUs at lab and partner sites. | Months 12-26 | **Impact:** Improved learning products meet actual student & teacher needs; **QL** - narrative feedback from pilot testers; **QN** - Likert scale feedback from piloters |
| 2.1.3 - Create and implement inservice and preservice opportunities for the above. | Months 27-36 | **Impact:** Increased capacity and efficacy of HM teachers to teach HL and CBE, STEM integrated instructional units; Growth of STEM skills, dispositions, and interests of impacted HM grade 6-12 students; **QN** - pre / post tests of participating HM students |
| **Objective 2.2 - Develop a matrix of criteria for leveling 6-12 HL informational texts** | | |
| 2.2.1 - Convene a development team to develop the matrix. | Months 3-12 | **Impact:** Classroom practitioner input grounds the matrix in teaching and assessment practices and developmental characteristics; **QL** - meeting feedback forms for continual improvement |
| **Objective 2.3 - Develop 14 leveled HL grade 6-12 informational texts (HLIT)** | | |
| 2.3.1 - Utilize matrix in developing 2 sets (14 texts) of HLITs for 6-12. | Months 13-32 | **Impact:** A 200% increase in supply of leveled HLITs for the target HM grade levels |
| 2.3.2 - Test pilot HLITs with internship WBLE participation of preservice Kahuawaiola student teachers. | Months 13-32 | **Impact:** Improved learning product meets actual student & teacher needs; **QL** - narrative feedback from pilot testers; **QN** - Likert scale feedback from pilots |
| 2.3.3 - Coordinate preservice Kahuawaiola internships in 2.3.1. | Months 13-32 | **Impact:** HL career skills for HM student teachers; **QN** - # of teacher / student teacher participants; **QL** - CBE, HL, and matrix adherence of HLITs (Rubric) |
| 2.3.4 - Revise and publish HLITs incorporating pilot feedback. | Months 18-36 | **Impact:** Increased access for all target HL learners to quality HLITs leading to reading comprehension and content area language growth. |

| TABLE 2 - PROJECT TIMELINE, IMPACT, AND QUALITATIVE/QUANTITATIVE MEASURES | | |
|---|---|---|
| **Activities / Milestones** | **Timeline** | **Impacts / Evaluation Strategies** |
| **Objective 2.4 - Disseminate all project digital and print learning resources** | | |
| 2.4.1 - Disseminate grade 6-12 HLSCUs, HLITs, and associated resources to all project partners. | Months 30-36 | **Impact:** Language, STEM knowledge and appreciation, and reading comprehension growth. **QN** - # of resources distributed, # of visits to Ulukau |
| 2.4.2 - Provide inservice and preservice teacher training for project print and digital resources. | Months 30-36 | **Impact:** Increased capacity of HM teachers to teach HL and CBE, STEM integrated instructional units; Growth of STEM skills and interests of HM grade 6-12 students;<br>**QL** - Open-ended feedback;<br>**QN** - Likert scale feedback |
| 2.4.3 - Engage student interns in disseminating project resources through the Ulukau digital library. | Months 27 - 36 | **Impact:** Increased access of KP participants and the public to HL digital resources; Growth of advanced language proficiency through engagement with multimedia resources.<br>**QN** - # of visits to Ulukau |

## MECHANISMS FOR ENSURING HIGH-QUALITY PRODUCTS AND SERVICES

Multiple mechanisms to ensure the quality of products, services, outcomes, and impacts are detailed in Table 2. A process for ensuring feedback and continuous improvement in the operation of the proposed project will be achieved through regular administrative meetings, full staff meetings, and unit team meetings. Formative qualitative and quantitative assessment tools will be used to gather input for each project objective from student interns, HM 6-18 students, teachers, and mentors, and other stakeholders. The PI, PD and Fiscal Manager will meet as often as needed, but at least once a quarter to advise, to counsel, and to verify that the objectives and activities of the project are being completed within budget.

The PD will hold regular monthly meetings with the coordinators of each unit section to ensure that the objectives of the project are being completed on time with the highest level of quality. Each unit coordinator will report on the progress of work that has been accomplished in the unit during the preceding month. The project implementation plan will be reviewed and revised as needed based on feedback received from pilot studies, formative feedback from the

various stakeholders, teacher surveys, student surveys, intern rubrics, mentor evaluations, and Kuamoʻo project staff input. Each unit coordinator will meet monthly with his or her unit team members to assure quality control, communication and feedback, and the progress of individual and team responsibilities. Lastly, the entire KP staff identified in the organization chart on page 24 will meet quarterly to revisit the goals and objectives of the project. This will be a time for the entire staff to evaluate progress made in the previous three months, celebrate achievements, problem-solve obstacles, and brainstorm ways to improve the implementation plan.

**Section F – Quality of the Project Evaluation**

**VALID AND RELIABLE PERFORMANCE DATA ON RELEVANT OUTCOMES**

The Kuamoʻo Project focuses on increasing access: access to college; access to mentorships and internships with HL and STEM specialists; access to STEM knowledge, academic programs, and career pathways; access to HL educational resources where there are critical shortages; and access to training to improve HL outcomes from grade 6 to 18. Additionally, the project is designed to address three of four current NHEP program performance measures: (1) The # of grantees that attain or exceed the targets for the project outcome indicators; (2) the % of students in schools served by the program who graduate from high school with a regular high school diploma in four years; and (2) the % of students participating in a NH language program conducted under the NHEP who meet or exceed proficiency standards on a test of the HL.

As detailed in Table 2, a wide array of assessment and evaluation instruments will be employed to determine project impact and guide implementation. To effectively document this multivariate project impact, the project makes use of a mixed methods evaluation design incorporating formative and summative measures using reliable and valid qualitative and quantitative methods to collect data on relevant outcomes. The validity of the measures lies in

the intimate familiarity of KH‘UOK researchers with the HM school communities throughout Hawai‘i where the cutting-edge project products and services will be piloted and have impact.

KP summative measures include: # of students from partner schools graduating in 4 years; # entering college; # of products produced (for example, the # of entries developed for the monolingual HL dictionary); # of resources disseminated; and # of grade 12-18 students participating in bridge courses, mentorships, and internships.

To guide effective fulfillment of the summative measures of project impact, numerous formative measures (Table 2) will be utilized for continuous feedback and improvement. As an example of the cutting-edge context of this formative assessment work, KH‘UOK and its partners are the only researchers presently working on leveling criteria for HL informational texts for grades 6 and above. Thus, the text characteristics criteria developed for the leveling matrix will entail community input, knowledge of the HL, familiarity with the language and reading levels of students at these levels, and working relationships with the HM schools and teachers involved. Formative assessments in this groundbreaking context will, in turn, shape development of HLCB informational books and a summative pre/post assessment instruments.

Evaluation methods, instruments, and performance measures (both quantitative and qualitative) are closely matched to the project’s goals, objectives, desired outcomes, timeline for implementation, and strategies. The project and its measures were designed to multiply access to Hawaiian language, culture, livelihood opportunities, ancestral and contemporary STEM insights, and help unlock a vast treasure trove of knowledge of the indigenous people of Hawai‘i.

**E laupa‘i ka ‘ike kuamo‘o!**

May these language and cultural treasures be ever more accessible and abundant.

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