STEAM CERTIFICATION PROGRAM
LOS ANGELES UNIFIED SCHOOL DISTRICT

Executive Summary

A recent report, “High Tech in L.A.” showed that Los Angeles leads Boston, New York and the Silicon Valley in the number of high-tech jobs. In addition, the Otis report on the L.A. Creative Economy indicates that one in eight Los Angeles jobs is part of the vital creative economy. Of even greater significance, “The U.S. Department of Commerce estimates that nationally, jobs in science, technology, math and the arts will grow 17% by 2020, nearly double the growth of non-STEAM fields. By 2022, the U.S. will have more than 1.2 million unfilled STEAM jobs.”

The response to these advantageous career opportunities is a heightened demand from LAUSD students and their parents for quality STEAM education programs. For the District, teaching relevant, in demand skills, that prepare students to become innovators in our continuously evolving world, is paramount - not only for the prosperity of our students, but for the future of the District and the nation. The expansion of STEAM programs presents a viable opportunity for the District to maintain and attract additional preK-12 enrollment.

Educating students in STEAM subjects (if taught correctly) prepares students for life, regardless of the profession they choose to follow. At this time, does the District have the capacity to provide the necessary, top quality STEAM education? While desiring to expand STEAM opportunities to meet the demand for all students, the District is faced with two strategic challenges:

*How do we accelerate and sustain academic progress through STEAM education pre-K through grade 12 and beyond for all students?*

Many K-12 students in LAUSD, especially those representing underserved communities, lack access to high quality, vetted, comprehensive, coherent and integrated STEAM programs of inquiry-based science, technology, engineering, arts and mathematics learning experience that take place both in and out of school.

To improve Science learning, the Division of Instruction has developed a new instructional plan (January 2018) focused on the Next Generation Science Standards (NGSS). When implemented district-wide, this framework will contribute to the building of scientific
knowledge for students, and establish an expectation for teachers as to what all students should know and be able to do towards scientific and STEM/STEAM student achievement.

How do we leverage our resources to successfully prepare every teacher and administrator for full STEAM quality implementation?

The majority of LAUSD teachers and administrators currently lack the job-embedded, high quality training and support they need to grow in their capacity as STEAM educators. When teachers are properly prepared, STEAM training empowers them to provide project-based learning that crosses all five disciplines (science, technology, engineering, arts, math) and fosters an inclusive learning environment where all students can engage and contribute.

As teachers and administrators become adept in making the innovative shift to new models of teaching, the paradigm shift begins not just in words, but in actions that spread to every classroom. We must achieve this same paradigm shift in LAUSD by creating our own world-class STEAM Teacher and Administrator Resident Certification Training Program. By partnering with the Division of Instruction (DOI), we propose to create a cohesive STEAM team to not only implement the NGSS standards, but to support and train teachers and administrators at the building level. We will create a STEAM pipeline of staff as resources for the schools.

Human Resources to Lead the Certification Training Program

The DOI has planned for full implementation of the Next Generation Science Standards (NGSS). District-wide science implementation in our schools will insist upon reform and change in the current professional development system. We must consider teacher training and development as a continuum that begins with the initial preparation of teachers to induction for actual classroom preparation, and classroom practice of teaching that aligns to systematic, needs based training and professional development, with district support that is on-going and on-site.

Twenty-first century learning, which is blended, personalized and competency-based, requires new skills, new roles and a new mindset for educators. The District’s Human Resources Division is directly involved in the support of new and veteran teachers. With programs such as District Intern, Early Childhood Education, Peer Assistance and Review, Administrative Services, Teacher Quality/Teacher Support and Development and other programs, HR is uniquely positioned to conduct a tiered leadership model towards a STEAM Certification Program for the District’s most innovative teachers and administrators.
The key components of the Certification Program are:

- **Update hiring profiles of teachers and administrators** to reflect their knowledge, skills and dispositions needed to teach and lead in a blended and personalized environment.
- **Develop Teacher and Administrator STEAM Certification modules that ensure teacher learning and provide salary point credit.**
- **Create a demand that preparation programs at colleges and universities** deliver competent teachers to the system with STEAM training. In addition, working with school administrators and the Division of Instruction, HR will develop a systematic way to identify and maintain a roster of talented teachers with leadership potential.
- **Create a lattice of teacher developmental roles,** creating classroom leadership for the present and the future. We intend to be purposeful in creating a wide range of leadership experiences to encourage excellence at every level.

**Program Goals and Outcomes**

The implementation of STEAM across the District, through the HR-led STEAM Teacher and Administrator Resident Certification Training Program, will achieve the following goals and outcomes over a 3-year period:

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<th>GOALS</th>
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<td>Administrators to build knowledge and skills necessary to support the implementation and support of the STEAM Certification Program at the building level. Teachers to build knowledge, skills, and strategies to implement STEAM at the classroom level through an interdisciplinary instructional approach.</td>
<td><strong>Administrators</strong> School administrators will demonstrate their ability to support the implementation of the STEAM Certification Program at the building level using the STEAM Support Framework to review, monitor, and provide continuous feedback to classroom teachers. <strong>Teachers</strong> Teachers will demonstrate STEAM knowledge, skills, and strategies through the use of best practice framework in the delivery of instruction in the classroom. <strong>Students</strong> Students of teachers in the pilot program classrooms will demonstrate through their academic work content knowledge and skills of the STEAM instructional approach; and increased academic achievement on common assessments.</td>
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Design of the STEAM Certification Program for Teachers and Administrators

The STEAM Teacher and Administrator Resident Certification Training Program design is guided by the National Research Council’s Framework for K-12 Science Education, California State Innovate Blueprint for STEM/STEAM, California Science Framework, the California Blueprint for Environmental Literacy, and research into currently existing STEAM education models. The program will be aligned to the LAUSD Frameworks for teachers and administrators, which describe how teachers and administrators will develop capacity in elements that support STEAM instruction.

There will be differentiated course models for teachers and administrators to complete the STEAM Teacher and Administrator Resident Certification Training Program.

Overview of STEAM Teacher Resident Certification Training Program

Training: 105 hours for teachers – online and in real time

- Our program will consist of 3 courses of two parts each. All courses will be offered in a hybrid model with both face-to-face instructor-led training and self-paced training online. The “STEAM Foundations and Access” and “STEAM Curriculum, Instruction, and Assessment” courses will each consist of 30 hours of hybrid coursework. The “STEAM Leadership and Capstone” course will consist of 15 hours of hybrid coursework in addition to 30 hours of participant homework.
- In total, the certification program will consist of 30 hours of face-to-face instructor-led training, 45 hours of self-paced online training, and 30 hours of homework which requires participants to create a digital STEAM portfolio as part of their “STEAM Leadership and Capstone” course.
- All courses will be infused with Digital Media Literacy and Instructional Technology support teachers need to leverage these tools in their classrooms.

Overview of STEAM Teacher Certification Courses

- **Course 1: STEAM Foundations and Access (30 Hours Hybrid Face-to-Face and Online)**
  - **Part 1: STEAM Foundations:** What is the vision and purpose for STEAM in the 21st century learning environment? In this course, participants will consider the potential for STEAM to transform student learning in their current setting. Participants will produce a STEAM vision that clearly articulates the purpose and impact STEAM education will have for their students. There will be a special focus on the role that the Next Generation Science Standards play in STEAM instruction.
Part 2: STEAM Access and Equity: How might STEAM instruction uniquely provide access and equity for all students? In this course, participants will explore the ways in which STEAM methodologies provide opportunities to increase equity and improve educational outcomes for ALL students. There will be a special focus on the role of language and literacy in not only connecting the STEAM disciplines but also in providing a strong foundation for student success.

Course 2: STEAM Curriculum, Instruction, and Assessment (30 Hours Hybrid Face-to-Face and Online)

Part 1: STEAM Assessment: What does high quality STEAM assessment look like? In this course, participants will learn how to design, deliver, and analyze student data from STEAM Performance Tasks. Additionally, participants will explore the role of the formative assessment process in guiding student learning. This course will have a special focus on Project Based Assessments.

Part 2: STEAM Curriculum and Instruction: What does high quality STEAM Curriculum and Instruction look like? In this course, participants will learn how to design and deliver classroom learning experiences that prepare K-12 students for success in a globally connected, 21st century society. A special focus will be on integrating the STEAM disciplines while emphasizing the Science and Engineering Practices in the creation of real life, relevant, and engaging learning experiences. This course will have a special focus on Project Based Learning.

Course 3: STEAM Leadership and Capstone (15 Hours Hybrid Face-to-Face and Online, 15 Hours of Homework)

Part 1: STEAM Leadership: How can my school organize for success with STEAM Implementation? Who are some partners that might join me in my journey? In this course participants will explore successful leadership and organizational change models needed to lead the work of STEAM on their campus. Engaging community partners in the process will be a special focus.

Part 2: STEAM Capstone: How can I design a STEAM strategic plan to focus the direction of STEAM education at my school site? In this course, participants will apply their learning from all other courses in the development of a STEAM Strategic Plan for their school site. This plan will include exemplar STEAM assessments and units of instruction. The Capstone experience will also provide participants the opportunity to conduct research alongside practicing scientists in the community in order to build their content and pedagogical knowledge.
Overview of STEAM Administrator Resident Certification Training Program

Aligned with the District’s leadership development model, training opportunities will be keyed to the role of the site administrator in implementing STEAM programs. Similar to the STEAM Teacher Certification, participants will complete a 3-course program in STEAM Leadership from LAUSD. This will include development of a schoolwide vision for STEAM instruction, facilitation of high quality professional development, accountability for monitoring instruction, supporting the staff with collaborative opportunities and resources, as well as communicating the program effectively through public relations and social media to the school’s community and stakeholders.

Compensation

Stipends will be provided to teachers and administrators for their participation in the STEAM Teacher or Administrator Certification process. In lieu of a stipend, participants may elect to earn District salary credits.

STEAM Certification will prepare educators to effectively teach and support STEAM instruction, achieving results with students. The ultimate goal of STEAM Certification is to ensure that teachers become accomplished STEAM educators, able to enact change in their classroom, school, and LAUSD, while improving achievement for all students.

Certification Program Impact

In the first year, the STEAM Certification Program will include 20 schools, with five teachers each (100 teachers total), and at least one site administrator from each school (20 administrators total). In years two and three, we will add 20 more schools with five teachers and one site administrator per school. Total participation in the pilot program will be 300 teachers and 60+ administrators.

Screening of participants will be made based on a “readiness index” selection process based on their progress and support needed in implementing NGSS and STEAM instruction. Additionally, participants will need to submit an application to the program as part of a team that is composed of five teachers and one site administrator. The team will need to describe their STEAM work to date, their reasons for wanting to engage with the process, and commit to engaging in the certification courses as part of a collaborative team.
Accountability and Evaluation

The program evaluator will work collaboratively with the STEAM Certification Program project staff and the Central and Local District STEAM Coordinators to provide program monitoring and quarterly analysis of training and implementation progress to determine if the project is meeting the specified goals.

Evaluation practices will include: 1) observation of program training activities; 2) review of participants’ survey comments on the quality and effectiveness of the online training components; 3) interviewing teachers and administrators individually and in focus groups to assess progress toward goals and outcomes; 4) classroom observations to determine the quality and fidelity of STEAM instruction; and, 5) analysis of relevant data from classrooms implementing STEAM teaching and learning.

Semi-annual reports will be provided the program administrators, Office of Human Resources, and Division of Instruction with immediate information to maintain quality and ensure continuous program improvement.

Technology Utilization for Effective Delivery

The program training will include 45 hours of self-directed online training. In addition to the 45 hours of self-directed online training, participants will create a digital portfolio as part of their Capstone course.

In addition, a STEAM Boiler Room website will be created as the hub for the training program. It will include lists of teaching resources, training opportunities, lessons posted by teachers, instructional videos of best practices, blogs by various educators in the programs and information exchanges for site visitors, special event announcements, grant opportunities, and catalogs of other online resources that support STEAM instruction.

Program Staff

The STEAM Certification Program will be staffed by one Project Director, two Project Coordinators, and two Teacher Experts, all with backgrounds in STEAM instruction and training. Clerical and technology support will also be needed. In addition, an External Evaluator will be engaged to measure the response to the training and the successful implementation of the training at each school site.
Sustainability

After the initial 3-year pilot implementation, the program can be taken to scale across the District and funded through a combination of Title II Professional Development funds, corporate sponsorships, and grants for professional development.

Summary

School districts across the country are developing STEAM teacher training programs, and even special credentials, to prepare their instructors for the challenges of this critical shift in education. We will be building a STEAM Certification Program that will promote blended, personalized, and competency-based professional growth in the next generation of STEAM teachers and administrators, ready to provide advanced learning for all Los Angeles students.

Working to Realize Our Vision for ALL Students

Students demonstrate their learning across all disciplines through highly relevant and engaging project-based instruction with an emphasis in science, technology, engineering, the arts, and math. It is our vision that all teachers from all disciplines can collaborate to develop rigorous performance tasks that integrate science, technology, engineering, mathematics, literacy, the arts, and other disciplines. Equity, access, and success of ALL students is ensured through the design and implementation of rigorous, culturally and linguistically responsive units of instruction.