telos

Technology for Equity
in Learning Opportunities

ANNUAL REPORT

2016-2017 Academic Year

CONTENTS

Background

The TELOS Initiative was established in 2015 as a result of a generous gift from the Nomellini-Olivier family. TELOS' overarching goal is to **create and investigate ways that technology can advance equity in learning opportunities for preK-12 learners, educators, and families**.

To achieve this goal, TELOS works to:
GOAL I: Facilitate the design, building, testing, and scaling of technology for learning;
GOAL II: Prepare and support education leaders and teachers to use educational technology in support of effective teaching and learning;
GOAL III: Support collaborative efforts in this domain both within and beyond Stanford; and
GOAL IV: Shape the discourse in this arena by widely disseminating the results of our efforts and by serving as a convening force in the field.

The following report details TELOS' activities in the 2016-2017 academic year. Our first full year of activities was the 2015-2016 academic year during which TELOS funded 10 faculty and student projects, offered a full-quarter seminar entitled Education's Digital Future: Equity by Design, hosted a cross-sector innovation lab, hired a new TELOS faculty member, and supported summer professional development opportunities for educators. Details can be found in our 2015-2016 annual report.

TELOS is structured as an initiative, rather than a center, so that work can be spread across all areas of the GSE and help connect diverse stakeholders.

Team & Partnerships

TELOS FACULTY CO-LEADS

Brigid Barron
Professor, Stanford GSE

Janet Carlson
Associate Professor, Stanford GSE
Director, Center to Support Excellence in Teaching (CSET)

TELOS STAFF

CHRISTINE BYWATER

Professional Development Associate, STEP (full time)

Christine is a Clinical Associate in Educational Technology for STEP (Stanford Teacher Education Program), a new position supported through partnership with TELOS. Her work focuses on supporting STEP students and faculty in integrating technology in engaging and equitable ways for students. She also collaborates with local schools and teachers to support the use of technology in K-12 curriculum and teacher professional development. Her work centers around the cohesive and equitable use of technology for K-12 students, the preparation of pre-service teachers to use technology, and the development of technology infused professional learning experiences for teachers. Christine has a background in Social Studies education and spent four years as a teacher in Brooklyn. Most recently she worked for Apple supporting education, youth, and professional development programs.

ANGELA ESTRELLA

Professional Development Associate, CSET (part time)

Angela Estrella is a Professional Development Associate and Instructional History Coach for the Hollyhock Fellowship Program at the Center to Support Excellence in Teaching (CSET). In addition to her work at Stanford, Angela works part-time as a professional development facilitator for Overfelt High School in San Jose and is a Teacher in Residence for Imagine K12, an incubator for educational technology startups. Prior to joining CSET, Angela taught history for 9 years and served as an educational technology mentor and instructional coach.

VIELKA HOY

Specialist in Education Technology,
Profesional Development Associate and Insturctional Coach (part time)

Vielka serves as Professional Development Associate and Instructional Coach in History with the Hollyhock Fellowship Program and Specialist in Educational Technology with TELOS. She supports history teachers in meeting their instructional goals and works with under-resourced schools to integrate greater use of technology in the classroom. Prior to joining CSET, Vielka worked for nearly twenty years in public, private, charter, and schools abroad as a teacher, administrator, and program coordinator. She also founded two college admissions consulting companies, Vielka Hoy Consulting LLC and Bridge to College Inc. She earned her BS in Social Studies Education from New York University and MA in Afro-American Studies from UCLA.

AMBER LEVINSON, Ph.D.

Research Associate (part time)

Amber is a Research Associate at TELOS. She drives core TELOS research activities including our grants program for faculty and students, designing TELOS public convenings featuring leaders in the field, while also conducting original research at the intersection of technology, equity, and learning. Amber's doctoral work focused on Latino immigrant families' use of technologies and included identifying how digital resources might better support language-minority families. Her prior research focused on technology creation and digital citizenship among youth. Amber began her career as a K-12 Spanish teacher and then spent six years living in Rio de Janeiro, Brazil, where she worked in media production and grassroots media arts education.

MOLLY ZIELEZINSKI

Research Assistant (part time, winter quarter)

Molly joined the TELOS team in winter quarter, 2017 during Amber Levinson's maternity leave. Molly is a doctoral candidate at the Stanford Graduate School of Education with a dual specialization in Learning Sciences & Technology Design and Curriculum & Teacher Education. As a former teacher, she is deeply committed to equitable outcomes in education, specifically in identifying and interrogating practices that support teaching and learning K-12 classrooms with underserved students.

ADVISORY BOARD

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GUADALUPE VALDES
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In 2016-2017 TELOS was also supported by:

JAVIER HEINZ
administrative support

SARAH MANDUDZO
finance management

HIEP HO
webmaster

JENNIFER RAY
events and communication support

GOAL I: Facilitate the design, building, testing, and scaling of technology for learning

Technology can be designed and used to promote deeper learning in and out of school, and Stanford is uniquely positioned to simultaneously create educational technologies and conduct research on what we create. Technology has the potential to support teaching and learning in literacy, math, science, language skills, and more; but its value depends on the quality of the content and the social interactions it catalyzes. Systematic efforts are needed to assess which tools work well for whom and under which circumstances. These efforts involve an iterative process of prototyping and testing in educational contexts—both in and out of schools. This cycle of needs-based design, development, and studies of technologies in use is greatly benefitted by involving colleagues who understand the economics and politics of education as well as the needs of teachers in classrooms. To advance this goal, TELOS provides seed grants and opportunities for faculty and students who are developing and studying technological innovations for learning. TELOS has also begun conducting its own research projects in this area which will expand in the 2017-2018 academic year.

2017 TELOS Grants

Through our grants to GSE faculty and students, TELOS supports a wide variety of work at the intersection of equity, technology, and learning. At the heart of the grants program is the mission to improve educational equity by creating and investigating ways that technology can uniquely contribute toward this mission.

TELOS grants support work that addresses our goal of advancing research as well as our goal of designing and scaling solutions. Faculty and student awards fund research projects at the TELOS intersection, as well as projects that include building/scaling of technologies at the intersection. In many cases, particularly with faculty and doctoral student awards, the projects are a combination of research and technology development.

TELOS grantees carry out work in a wide range of settings, from rural China, to urban U.S. classrooms, family homes, and in community learning settings. Projects focus on PreK-12 students, teachers, and/or families. In most projects, technology is being studied (in many cases, also designed and built) as a resource for learning (learner facing technology). In three projects, the role of technology is to provide meaningful ways for researchers to answer questions about equity (researcher facing technology).

Some of the ways in which 2017 TELOS projects seek to advance equity through the use of technology are:

- Using technology in new ways to offer learning opportunities that are potentially more engaging and/or intentionally designed, such as culturally-relevant virtual reality lessons for science.
- Designing and studying technologies to support family learning with mobile devices.
- Making learning tools available to students who have had less access due to location and resources (such as in rural China).
- Using technology as a tool to more deeply investigate and understand issues of equity in education.

The first round of grants funded through the TELOS Grants Program were awarded in the spring of 2016. Our 2015-2016 annual report details the 10 projects (5 faculty, 5 doctoral students) that were awarded at that time.

In the 2016-2017 academic year, TELOS' second year of funding, 15 new student and faculty projects were awarded. For the first time, awardees included masters students who could apply for up to $2500 in funding. Details of all new projects are described on pages 9-14 in this report.

Our selection criteria for TELOS grants takes into account first and foremost the centrality of equity to the proposed project. The interpretation of equity is broad and TELOS funded projects target many different populations and dimensions of equity.

In 2016, in response to requests for smaller grants to support more rapid innovation by faculty, for example prototyping and building a research-based technology, TELOS created a new Faculty Small Innovation Award category, which faculty can apply to on a rolling basis.

Awards granted this academic year included:

New 2017 TELOS Faculty Grantees

Faculty Scholarship/Research/Design Awards (up to $100,000). In Fall of 2016, TELOS launched the second RFP for these larger faculty awards. Three faculty were awarded grants:

BRYAN BROWN
Science in the City: The Culturally Relevant Pedagogy Approach to Virtual Reality Science Lessons

This project studies the implementation of virtual reality science lessons to understand how students and teachers respond to, and are impacted by, culturally relevant virtual reality in their classrooms. The participating schools are minority-serving institutions comprised of mostly low-income African-American and Mexican-American communities. The project anticipates having a lasting impact on these schools even after its completion, providing participating teachers with professional development in teaching science, emphasizing how to use technology for science teaching, and modeling ways to integrate culturally empowering pedagogy with tech-based education. Additionally, the team anticipates a potential product of this project to be a series of culturally relevant science lessons that can be distributed to urban elementary schools nationwide.

GEOFF COHEN
Targeted, Tailored, and Timely Interventions through Mobile Technology

Research has made it increasingly clear that brief interventions can have large effects when they are well-targeted, tailored, and timed. That is, the "right" person receives the "right" message at the "right" time (Cohen & Sherman, 2014; Cohen, Garcia, & Goyer, in press). For example, a high school student who is intimidated by the application process for financial aid might receive, a few days before the deadline, a reassuring word of encouragement and a reminder to apply. The intervention seems small but, because it occurs at a critical moment, it can have disproportionate impact. Apps permit a high degree of targeting, tailoring, and timeliness at an unprecedented scale, offering the possibility of large-scale, impactful, and scientifically-informed social change. TELOS funds are supporting complete development of the app Dr. Cohen and team have developed, currently a prototype, and the experimental evaluation of its efficacy. The goal is for the app, once developed, to offer a cost-effective way to close opportunity gaps at scale while still maintaining the personalization of small-scale psychological interventions.

PRASHANT LOYALKA
Bringing Online Computer Assisted Learning to Rural Areas in China

TELOS supports Dr. Loyalka's work to develop and evaluate an online CAL (computer assisted learning) package that is tailored to China's national curriculum. The individualization that CAL offers is important in China's fast-paced, rigid curriculum. In rural areas, where there is more danger of children falling behind their urban peers, remedial tutoring is often unavailable. Thus the project aims to move CAL forward and make it available and useful for millions of students in rural China to help close the gap. The evaluation research aims to determine what mechanism best produces student gains when using CAL.

Faculty Small Innovation Awards (up to $25,000). Open to faculty all year on a rolling basis, these awards are designed to support design innovations that faculty would like to develop based on their research.

BRIGID BARRON
The Learning Pathways Project

Learning Pathways is a biographical timeline development tool that can combine the power of big data with the deep contextual understanding of qualitative data (e. g. retrospective interviews and/or longitudinal case studies). The prototype app is designed (1) To support reflection through a tool that allows one to visualize learning resources; and (2) To collect data based on user-generated learning pathways. Such a tool can allow individual users to tell, augment, and supplement their learning stories, and then can export datasets across users, leading to robust connections and deeper understanding about the stories that big data can tell us and the patterns that they reveal. The outcomes are twofold: Both timeline-based learning biographies of individual learners, highlighting opportunities, challenges, learning partners, resources, connections made between synergistic projects, collaborations, and ideas across setting and time; as well as contributions to the existing database through new data points from individual users that can be exported, analyzed, and visualized across participants.

SHELLEY GOLDMAN
Playful Science for Families

Ideas about what science is and how to engage in science learning tend to be based on the science people have been exposed to in school. Many parents worry that they do not "know" enough science to be "helpful" and "correct" with their children. Using TELOS funds to design a mobile app called "Playful Science for Families," Dr. Goldman aims to introduce a "playful" version of science for families with children ages 4-9. The app helps families engage science, introducing activities that are easy to carry out in everyday contexts. The activities emphasize exploration, observation, sensemaking, and questioning. The app also enables families to create their own science activities that they can use and submit to us for possible publication to other families in updated versions. The hope is that the app will prompt playful science learning for thousands of families so that children have many opportunities to build foundational practices and dispositions that complement the science they will engage in school. The team's research focuses on understanding how families take up and enact science on their own terms and in their own spaces. The app platform enables research with a larger number of families, as anonymous user data can be collected within the app.

New 2017 Doctoral Student Grantees

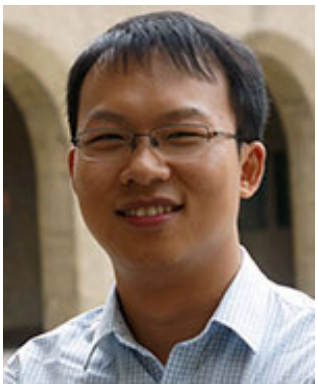
GSE Doctoral Student Awards (up to $7500). Three GSE doctoral students were awarded grants in Spring 2017.

KEITH BOWEN
Virtual Student Exchange: Contact Theory in Online Learning Environments

This project uses contact theory to explore how a virtual international exchange experience might help break down negative biases and build positive attitudes. Student exchange is widely recognized for its value to promote generational change. However, in-person student exchange is an expensive and demanding form of educational experience, one more often available to students from high-income countries, and one that requires even these students to have substantial means and flexibility to live far from home for extended periods of time. We use new media and technology to connect two classes of future PreK-12 teachers, one at a state university in Northern California, U.S. and the other at a comparable university in Beirut, Lebanon, developing a new pedagogical model we call Virtual Student Exchange. TELOS will support a study of the exchange program's impact in reducing stereotypes and improving attitudes among students who participate, in comparison to a control group.

MATTHEW KELLY
Unequal by Design: Public Policy, Space, and the Roots of Educational Inequality

Leveraging new geospatial technologies, "Unequal by Design" investigates the roots of inequality between school districts in the San Francisco Bay Area. Examining the period between 1850 and 1950, this project traces the creation, redefinition, and movement of school district boundaries in the past so that education scholars, policymakers, and practitioners can better address educational inequality in the present. This project seeks to create important historical data that supports continued calls for more equitable school funding.



JING LIU
Measuring Teacher Practices and Their Impact Using "Text as Data" Methods

The project uses novel "text as data" methods to analyze transcripts of classroom videos by leveraging computational power. I use data from the Measures of Effective Teaching (MET) project, which recorded videos of teachers in 310 schools in six districts serving high poverty student populations. Using transcriptions of classroom videos, I apply several "text as data" methods, including Structural Topic Modelling (STM), "bag of words," and sentiment analysis to create metrics of teacher-student interaction patterns and their language features. By linking those measures to multiple measures of teacher effectiveness, this research aims to generate knowledge on why some teachers are more effective than others and how to improve teacher effectiveness particularly for students most in need of high quality instruction. This research also provides a demonstration of how to use computational social science methods to study teaching and learning in K-12 classrooms.

New 2017 Master Student Grantees

GSE Masters Student Awards (up to $2500). Eight GSE masters students were awarded grants for a total of six projects.

ALI AZHAR
Simurg

Simurg is a novel model for structuring learning experiences for students in rural Pakistan. The model describes a collaboration across multiple levels - with village teachers, local and remote mentors, and university researchers - to co-design lessons aimed at extending the curriculum to skills such as collaboration, creativity, and problem solving. A variety of existing information and communication technologies allow the school to leverage the assets of the local community and the skills of remote collaborators. In our work with the elementary school Banyan, introduction of low-cost robotics kits and other digital tools showed promising gains in computational thinking and language literacies.

FABIO CAMPOS & LEINY GARCIA
MyHood

Adolescents are generally aware of their neighborhood conditions and opinionated about the changes they want to see. Yet, there is a low sense of empowerment and agency, and lack of academic relevance that deters them from active engagement. MyHood helps adolescents uncover, explore, and discuss topics related to their place as a means to engage them with their communities and issues that matter to them. Using an accessible mobile platform, adolescents map and analyze challenges and resources in their neighborhood to formulate opportunities for action. With MyHood, adolescents learn what they can do for their Hood together.

ALIZA HOFFMAN & KIMIYA HOJJAT
Candid

Growing up is tough, and so is talking about it. Parents might not have the right language or confidence to bring up topics in comprehensive sex education, and while kids are curious, they may not always know what to ask. Instead of silence or embarrassment, learning about growing up can be an opportunity for coming together, sharing stories, and engaging in positive and playful learning experiences. Candid is a mobile tool that leverages popular media and interactive question prompts to foster meaningful conversations that encourage kids to think critically and make smart decisions about their well-being and relationships.

JULIA RUBIN
Teacher Feedback in Lacuna Stories

Research suggests that teacher feedback on student writing can be a powerful force for learning. For students in urban and under-resourced schools, the likelihood of receiving feedback they cannot effectively implement is higher than middle-class, predominantly white schools, resulting in less effective acquisition of writing skills over time. The goal of this project is to build a tracking tool that collects teacher comments on student writing and provides dashboard data about the types of feedback a teacher gives to individual students over time as well as trends in teacher feedback to an entire class. I will adapt the Lacuna Stories platform for writing, rather than reading, in service of teachers developing personalized writing instruction for students based on a portfolio of their work.

MAYA SUSSMAN
Práctica

There are 23 million adults in the United States with limited English proficiency. Many English learners frequently interact with English speakers at work, at the grocery store, and at their children's schools, and research shows that increased exposure to English leads to an increase in proficiency. However, a lack of confidence and a fear of failure often prevent recent immigrants from taking advantage of these interactions to improve their English. Through a combination of practical conversational content and daily speaking challenges, Práctica helps learners transform these everyday conversations into low-risk learning opportunities that boost both their confidence and their English proficiency.

CASEY ULRICH
ConquerEd

ConquerEd is a technology that aims to teach students the power of setting a goal, creating strategies to help them achieve that goal, and reflecting on the learning process, derived from the paper-based process Casey used in the classroom. The culture of power in schools equips those from mainstream culture backgrounds to navigate schooling more easily than those from non-dominant backgrounds. By coaching students to think about their actions and reflect on them, ConquerEd hopes that what is currently hidden from students can be made clear in order to ensure all students have the opportunity to learn at the highest levels. ConquerEd's goal is for every student to develop a set of strategies that help them become confident learners and propel them to success in school, college, and career. TELOS supported ConquerEd's participation in the ISTE conference.

Read more about faculty and student grant projects at telos.stanford.edu/funded-projects.

TELOS Alumni News

First TELOS graduate: Dr. Holly Pope

Holly Pope, member of the first TELOS grantee cohort in 2016-2017, recently defended her dissertation on math learning with digital games among underserved students. The $7500 TELOS grant funded a set of 13 iPads for the study in which she implemented a research-based math game, Wuzzit Trouble, in third grade classrooms and examined students' learning via pre- and post-game assessments.

"The TELOS grant was perfect timing for me and exactly what I needed for my work," Dr. Pope says. "Had I not gotten this grant, my study would have been very different. I might have worked with a small group of children, maybe sharing iPads, which I would have had to gather from many different places."

Dr. Pope now holds a tenure-track professorship at the University of Hawaii at Mānoa. In her new role, she uses technology with preservice teachers in her STEM and math teaching courses, while also relying on her TELOS-funded iPads to advance her research agenda.

"I'm always going to be looking at issues of equity and underserved populations. In Hawaii, the underserved population is Native Hawaiians. I'd like to look at how equity in technology and mathematics is playing out there. I'm going to schools with high populations of Native Hawaiians and will implement studies with them using the iPad lab. There are many questions that I still want to answer and the lab will help me do that without worrying about getting technology to do it. Especially since I'm at a state school, [funding for] technology is going to be hard to come by. Also, Hawaii is an under-performing state [according to some national measures] so I think Hawaii will be a place where the iPads could work to improve outcomes for underserved children."

Additional TELOS Research & Innovation Activities

LDT Equity & Design Workshop
November 4, 2016 | Stanford University

In fall of 2016, TELOS Research Associate Amber Levinson conducted a workshop for the Learning Design and Technology Masters cohort (22 students) in which students used ethnographic cases of language-minority students and families as inspiration for a design thinking charrette. Deriving needs and insights from the stories of families, the Masters students designed solutions for the specific needs of the children and parents in the cases.

The objective of the workshop was to introduce students to the cases and have them take the perspective of families whose voices are often underrepresented in educational technology spaces. In addition, the workshop encouraged students to target equity challenges as they envision and craft their Masters projects.

6th iHub Pitch Games
June 22, 2017 | Google

Angela Estrella participated as a judge panelist providing guidance to administrators and educators in Fremont Union High School District and Gilroy Unified School District.

5th iHub Pitch Games
August 31, 2016 | Google

Janet Carlson participated as a judge panelist for the 5th iHub Pitch Games.

Sequoia School District Partnership

Amber Levinson participated in a half-day meeting with leaders from Sequoia School District as part of a developing research-practice partnership between Sequoia and Stanford, facilitated by California Education Partners.

GOAL II: Prepare PreK-12 education leaders and teachers to use educational technology in support of effective teaching and learning

In order to ensure that technology helps advance equitable learning there is a need to build capacity among education administrators to (a) evaluate and identify the tools that will best support student learning, and (b) engage and support the educators in their organizations to embrace and productively use these tools. Teachers also need to develop the knowledge, skills, and resources to support the effective use of educational technology in the service of student learning.

Educators of pre-service teachers and those who provide professional development for teachers need to cultivate teachers' ability to be critical consumers of the many technologies they will encounter in their careers. As critical consumers, teachers will need to know how to evaluate, choose, and align the type of and uses of a range of technologies with learning goals and student needs. Teachers cannot simply be trained to use particular technologies because what they are taught to use will likely be obsolete within a few years. The challenge is to prepare and support teachers to be able to make meaningful decisions based on the needs of their students and their learning goals. Teacher education programs across the country are struggling to figure out how to achieve this. Building on the GSE's strengths in the fields of teacher preparation and professional development, our goal is to develop and disseminate models of teacher education and professional development that educate teachers to be intelligent consumers and users of learning technologies.

To develop our own capacity in the GSE and serve as a leader in the field that addresses the issues above, TELOS works to:
Identify innovative models for the preparation of teachers and education leaders to be critical consumers and users of technology;

- Create and test models of pre-service preparation in STEP and of in-service support in CSET (using both face-to-face and online programs) which are focused on helping teachers review the relevance of various educational technologies and then use them effectively in their own teaching so that they serve as educational leaders within and beyond their schools;
- Convene workshops and seminars organized around powerful learning for educators, student teachers, and administrators;
- Create a robust, continuously updated and reviewed library of tools, apps, software for STEP students, local STEP alumni, and teachers at our partners schools to explore and borrow.

Preparing Preservice Educators

In 2016, TELOS partnered with STEP (Stanford Teacher Education Program) to hire a Clinical Associate in Educational Technology to support technology integration in the program so that teacher candidates will be better equipped to support equity in their future classrooms and schools. Christine Bywater began collaborating with STEP in early 2016 and joined the team full time in May 2016.

GOALS

STEP students (Teacher Candidates):
- Infuse more technology into their coursework.
- Support TCs one-on-one and in different spaces to strengthen their understanding of the analysis of technology practices and to understand methods of infusing technology in meaningful ways.

Placement Schools:
- Understand the STEP cooperating teacher (CT) recruiting process and get to know CTs who are infusing technology.
- Develop partnerships with the Teachers on Special Assignment (TOSAs) who focus on technology in the districts in which we work.

Collaboration:
- Form working partnerships with companies or schools to further understand how to best support teachers in technology.

PROGRESS IN THE 2016-2017 ACADEMIC YEAR

STEP Students

In the 2016-2017 academic year, Christine worked with the instructors of two courses, Secondary Seminar and Elementary Supporting Students with Special Needs, to infuse technology on a regular basis. The objective was to integrate technology in order to provide multiple opportunities for STEP students to interact with digital tools. This was done via regular planning meetings with the instructors and by providing co-teaching support in the classroom. Christine also established a partnership with PATCH (Palo Alto Technology Collaboration Hub) to bring in expert speakers and lesson planning ideas about UDL into the Elementary Supporting Students with Special Needs course.

In addition, Christine hosted EdTech Chats and facilitated technology integration in two other STEP courses: Elementary Seminar and Secondary Supporting Students with Special Needs.

In exit surveys, STEP students responded positively to the integration of technology into their learning experiences and have offered ideas for further expansion of this work.

iPad for Learning Program. In the summer of 2017, TELOS partnered with the VPTL office to allow every STEP student to have an iPad for the entire STEP year at Stanford. The tablets are being heavily integrated into their Literacies, Elementary Science, Child Development, and Secondary Seminar courses. Three STEP instructors participated and were loaned iPads for their fall quarter courses.

STEP literacies course

Christine Bywater collaborated with new TELOS professor Antero Garcia on ED 289: The Centrality of Literacies in Learning and Teaching, to infuse technology and model innovative practices as part of the course, including using Twitter for professional collaboration and creating a "digital tool diagnostic" in which students identify a digital literacy tool and share sample class-specific activity for utilizing this resource. Through a research-based foundation, the course is designed to build a socio-cultural grounding in how literacies are enacted and supported both in secondary classrooms and in out-of-school settings.

Placement Schools

Technology integration by cooperating teachers (CTs) in placement schools. In this first year of work we identified that few cooperating teachers working with STEP use/integrate technology in their instruction. Relationships were formed with TOSAs in partner districts & schools (San Mateo Unified, Sunnyvale SD, Santa Clara Unified, Barron Park). Currently Christine is working with TOSAs to understand professional development models at schools and how to best support candidates and their CTs in the use of technology.

Preparing Inservice Educators

Professional Learning Experience (PLE) for Educational Technology Leaders

The need for Professional Learning Experiences (PLEs) for Educational Technology Leaders emerged from our 2016 seminar series, Education's Digital Future: Equity by Design. Research finds that the majority of technology is implemented in ways that sustain current models of teaching, instead of inspiring more innovative and creative practices. Many schools do not have a clear vision for preparing teachers to use the technology in effective ways with students (Darling-Hammond, Bullock, & Goldman, 2014).

The target audience for the PLE are Educational Technology Leaders. We later expanded the audience of the PLE to include teams of teachers comprised of an Educational Technology Leader TOSA and small group of teachers from the same school site.

The goal is to design and implement a PLE for technology integration leading teachers that creates, then lays the foundation to resolve, cognitive dissonance around the characteristics of effective technology use in classrooms and the necessary conditions for transformative professional learning. The PLE would be executed in 3 phases:

1. In-person kickoff course at Stanford where school teams of educational technology leading teachers will gather to build a professional community, experience practice-based professional learning, and develop a plan to conduct user-centered design with their audiences.
2. Multi-day design workshop where educational technology leading teachers will define a unique problem for their particular context, ideate potential solutions, and test prototypes in order to design professional learning experiences that align with school/district/teacher visions and goals.
3. Educational technology leading teachers will deliver ongoing professional learning experiences to their audiences, elicit feedback, and reflect on the experience for future iteration. In addition, educational technology leading teachers will receive ongoing coaching.

PLE Development Timeline:

EXPLORATION September 2016 - December 2016
- Collected Resources & conducted user interviews

DESIGN January 2017 - April 2017
- Developed initial program plan and training skeleton
- Conducted interviews for feedback
- Revised training design
- Develop reflection tool (in progress)

COMMUNITY & TESTING September 2017 - Winter Quarter 2017
- Develop community of potential participants
- Test and iterate training design

LAUNCH Spring 2018

Hollyhock Fellowship Coaching (Ongoing)

TELOS supports coaching inservice teachers in the area of technology and equity within the Hollyhock Fellowship program. The Hollyhock Fellowship welcomes 80-90 high school teachers from across the country each year who work in schools serving at least 50 percent low-income students, and are interested in deepening and developing their content-specific instructional practices and creating equitable access and opportunities for all learners in their classrooms. Hollyhock Fellows make a commitment to remain at their current school for the duration of the two-year fellowship so that they can support one another in their professional growth and make an impact at their schools.
Over the course of the 2016-2017 school year, Angela Estrella has continued to coach three Hollyhock Fellows engaged in a virtual co-teaching partnership. In these coaching sessions, the Fellows deconstructed the enactment of lessons they co-planned and, as part of the Hollyhock coaching model, participated in virtual coaching sessions to:

1. Identify a problem of practice from shared artifacts of learning (e.g. classroom video, student work),
2. Discuss a strategy to address their identified problem of practice,
3. Develop a plan to enact the strategy and record the enactment to share with each other and Angela.

Deconstructing the enactment of the same lesson distinguished the teachers in the co-teaching partnership from the other teachers Angela coached in Hollyhock. Zach Seagle and Justin Taylor, the two teachers that launched the virtual co-teaching partnership at Hollyhock, recently presented at ISTE in San Antonio. More context on how Zach and Justin started their co-teaching partnership is detailed in an article they wrote for EdSurge.

Hollyhock | Equity in Education Conference (July 18, 2017)

The Hollyhock Fellowship held its 2nd Annual Equity in Education Conference on Tuesday, July 18th, 2017. Based on the positive feedback received from the prior year's conference, TELOS returned presenters who explored topics at the intersection of technology, learning, and equity. Session titles are below, and the conference flier can be found here.

TELOS sessions at the conference included: "Code for What? Engaging the Multi-literacies of Urban Youth Through STEM," presented by Cliff Lee, Saint Mary's College of California; and "Bringing All Students into the Discussion with Backchanneling," presented by Angela Estrella.

Hollyhock | Summer Institute (July 10 - July 28, 2017)

In addition to the TELOS sessions offered at the Hollyhock Equity in Education Conference, the following sessions were also offered throughout the 2017 Hollyhock Summer Institute.

Making Space: Equity and the Maker Movement || Presenter: Jeff Kilner, Hollyhock Leading Fellow
Session Description: Are you interested in joining the maker movement? Are you unsure of where or how to start? If so, spend some time with Jeff learning about how Sussex Central's STEAMLab is aiming to increase accessibility to science, technology, engineering, art, and math curriculum through student-developed projects. Then, take some time to collaborate with other fellows to perform a site inventory that will help you identify where to get started in your makerspace quest in an effort to create equitable making at your school site.

Technology for Facilitating Student-to-Student Discussions || Presenter: Pamela Levine
Session Description: Facilitating successful peer discussions requires substantial teaching skills. Students must be helped to engage in practices such as giving explanations, making connections, and using representations. At the same time, teachers' "moves" must be contingent on what students say and do. Free technologies like PollEverywhere, Socrative, and Plickers can help in this endeavor by capturing and providing data that serve as a jumping point for explicit instructional choices. In this session, you will: 1) Identify which technology is the right fit for your classroom (whether you have 1-to-1 computing devices, no classroom devices at all, or something in between) and 2) Learn and practice how to combine these tools with discussion strategies and teaching moves. We will use a hands-on format, so please bring a laptop if you have one (and/or be willing to share).

Instructional Coaching Literature Review

Tina Ehsanipour, Florencia Gomez Zacharelli, and Janet Carlson are collaborating to produce a review of the literature on instructional coaching for Digital Promise. The lit review summarizes research on instructional coaching, and best practices for designing and implementing effective coaching programs.

CSET & STEP Technology Convening

About the Convening: On June 14, CSET and STEP convened local K-12 practitioners who are effectively using technology with students. The convening was designed to build community, highlight and share the challenges and successes of using technology, and ideate on ways to develop teachers as practitioners who use technology to support equitable student learning. We invited a targeted group of STEP alumni and CSET teachers, and asked them to include a great teacher they knew for this work. The convening was held Wednesday, June 14th in the CERAS building at Stanford University and hosted 10 Bay Area K-12 educators. The day was focused on sharing stories, brainstorming best practices, and ideating on what is necessary to be a teacher who infuses technology in creative, equitable, and challenging ways. To see more from this event, please click the following links: Storify Recap & Exit ticket.

GOAL III: Catalyze Collaborative Efforts at the TELOS Intersection

There is very limited interaction today among people who design learning technology; researchers who study what kinds of technology work, for whom, and for what purpose; educators who prepare teachers to use technology in their classrooms; and practicing teachers who are already working with technologies in their classrooms. TELOS aims to help coordinate efforts by weaving these groups together to ensure that those who invent technology are informed by research and practice related to teaching and learning, and that those who prepare teachers are informed by the latest innovations and knowledge about their effectiveness in promoting learning. We also work to inform leaders in all of these areas by promoting understanding of the social, cultural, and economic contexts in which people are using technology.

Our Partners & Collaborations

TELOS has developed partnerships with several organizations across practice, policy, research, and the technology industry to catalyze efforts at the intersection. Below is a list of TELOS' major partners.

CS + Social Good at Stanford

CS + Social Good is a 10-week program in which Stanford students with computer science skills have the opportunity to design, prototype, and implement a social impact project that is based on a preliminary challenge statement provided by community impact partners that are assigned to each student team. Students in the program also have the support of design and technical mentors working in industry. The purpose of the CS + Social Good Studio is to give students a deeper understanding of the social issues in the surrounding community, as well as provide the tools and resources you need to help solve some of these issues.

TELOS team member Angela Estrella has participated as a community impact partner and advised CS+Social Good teams addressing school-based challenges.

Digital Promise

Digital Promise is a national non-profit organization that was created with the mission to accelerate innovation in education to improve opportunities to learn.

The Digital Promise team presented and helped facilitate some of our "fireside chats" during our 2016 speaker series. Digital Promise has now expanded to include Digital Promise Global which will include major research efforts at the TELOS intersection, on which TELOS will collaborate as it develops.

Joan Ganz Cooney Center at Sesame Workshop

The Joan Ganz Cooney Center is an independent research and innovation lab that focuses on the challenges of educating children in a rapidly changing media landscape. The Cooney Center conducts original research on emerging education technologies and collaborates with educators and media producers to put this research into action. The Center also aims to inform the national conversation on media and education by working with policymakers and investors.

The Cooney Center is a longtime TELOS partner, and collaborative activities in the past year have included planning the FamLAB Innovation Lab (see next section) as well as contributing to a national survey investigating how children learn in different settings (home, school, community, etc.) and the role of technology in connecting learning across physical locations.

National Center for Digital Equity

NCDE's mission is to advise and assist the nation's communities and digital equity investors in designing optimally impactful digital equity initiatives in support of educational and economic opportunity.

TELOS has conducted initial meetings with NCDE and plans to collaborate with this new organization on their upcoming projects.

Redwood City School District

Redwood City School District serves a diverse population of K-8 students, including a large proportion of English learners. TELOS is developing a partnership with RCSD leaders to design and implement targeted research that investigates various aspects of technology integration in the district, in order to help inform strategy for the district itself as well as contribute to knowledge about best practices for the broader population.

Silicon Valley Education Foundation

SVEF is a nonprofit resource and advocate for students and educators that is dedicated to putting all students on track for college and careers, focusing on the critical areas of science, technology, engineering, and math (STEM).
SVEF has been a key partner in engaging broader audiences including school district teachers and administrators in TELOS events. TELOS team members have also contributed to SVEF's projects including the iHub program which seeks to connect education practice, educational technology industry, and research. Brigid Barron participates as an iHub board member, and Angela Estrella and Janet Carlson have contributed as panel judges for the program.

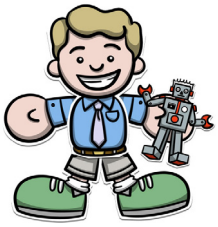
Families Learning Across Boundaries (FamLAB) Innovation Lab

November 8-10, 2017

TELOS collaborated on the design and planning of the FamLAB Innovation Lab, an intensive 2-day workshop hosted at Stanford by TELOS in partnership with the Joan Ganz Cooney Center at Sesame Workshop. This event was part of a larger program of activities proposed by the Cooney Center, including a national survey and a funding competition to seed new solutions that connect students' learning across various settings such as their home, school, after-school programs, and community. In addition to the two-day, invitation-only workshop, a public TELOS speaking event was offered the evening before.

Learning, Design, & Technology Program | Prototyping Workshop Series

In spring of 2017, Andy Russell, founder of LaunchPad Toys, now part of Google, led a series entitled the ProtoToys Workshop Series. The evening workshops were for Learning, Design, and Technology as well as Learning Science and Technology Design students, and the goal was to encourage prototyping projects using toys. The series brought in designers from the teams developing each of the toys/tools/apps to talk about the art of prototyping, teach the tricks of their toys, and work with students to start prototyping different ideas they might have. TELOS contributed funds to provide food for students at the evening sessions and Brigid Barron participated in the events.



Andy hosted three workshops. The first, entitled Software Prototyping with Scratch, included talks by Heather Madison from the Children's Creativity Museum and Champika Fernando from the ScratchBlocks team at Google. The second session, Video Prototyping with Toontastic and Adobe Spark Video, featured talks by Thushan Amarasiriwardena of the Toontastic team at Google and Tom Nguyen from Adobe. Finally, Electronics Prototyping with littleBits featured presentations by Andrew Sliwinski from the Scratch team at the MIT Media Lab and by Liza Stark from littleBits.

Following the three workshops, the group went to the Children's Creativity Museum in San Francisco for a hands-on testing session of their prototypes with children and families.

Computational Thinking Activities in Development

In the 2016-2017 year, TELOS has begun to investigate the possibility of creating or supporting computational thinking learning opportunities for educators. TELOS team members have participated in meetings with Google to discuss this direction, and TELOS is exploring the possibility of supporting CT learning opportunities for STEP students, who do not currently have the opportunity to learn CT in their coursework.

GOAL IV: Shape the discourse in this arena by widely disseminating the results of our efforts and by serving as a convening force in the field

TELOS aims to have national and international visibility and to influence educational researchers, technological innovators, and practitioners. Stanford can convene large and diverse audiences (industry, educators, researchers, policy makers, etc.) who have interests in promoting technologies for learning. There is a huge demand for this information and no university is better positioned or respected to meet it.

To advance this goal, TELOS works to:

- Maintain a web presence to announce and magnify the GSE's commitment to this endeavor;
- Highlight the work of TELOS, expand our audience, appeal to teachers and school administrators, and develop a community of learners;
- Develop opportunities to bring together varied audiences such as seminars, conferences, events, etc.;
- Work directly with schools and districts, as well as create market/industry partnerships, to ensure that practice and new products are informed by best-in-class research on the use of technology to enhance learning.

TELOS Spring Convenings 2017

In Spring of 2016, TELOS offered Education's Digital Future: Equity by Design, a quarter-long, weekly seminar highlighting key issues at the TELOS intersection. Reflecting on the seminar experience and participant feedback, we identified some topics of high interest and importance at the intersection that were not directly addressed in the seminar, as well as feedback requesting more depth in the event content (rather than a focus on breadth of topics and speakers). Based on these reflections, we identified two topics: How technology might support special needs learners, and improving gender equity in computer science fields, to address in this year's convenings. We offered two events, one focused on each of these topics, in April and May 2017.

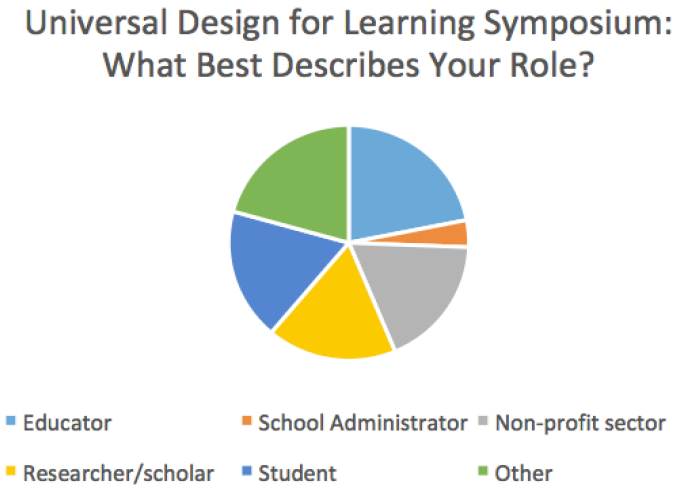
Our third Spring event showcased the TELOS-sponsored projects at Stanford GSE, bringing together work on a wide range of issues at the intersection. This event offered a breadth of topics in an exhibit fair, as well as a keynote session with a more in-depth discussion on the theme of online literacy.

As part of the goal to engage across sectors and bring together researchers, educators, students, industry professionals, community leaders, and others; TELOS has built a diverse network for promoting events and drew participants from all of these groups for its Spring convenings (see specific attendance information for each event).

In addition to our own TELOS events, we partnered with leaders from Redwood City School District to support "Bright Futures: Equitable Access to Learning in the Digital Age," a conference for educators and others interested in technology, equity, and education. TELOS team members Brigid Barron, Amber Levinson, and Molly Zielezinski presented workshops at the conference, and TELOS offered scholarships for 20 STEP and other GSE students to attend.

Equity and Access through Universal Design for Learning (April 10, 2017)

Early in the 2016-2017 academic year we identified the topic of technology and equity for special needs learners as an important one that had not been touched upon in our 2016 series. We chose to focus on the Universal Design for Learning framework, an important and broadly applicable model that would be of interest to our diverse, cross-sector audience. Dr. David Rose is a leader in this field and pioneer of the Universal Design for Learning framework as well as an innovator in the space of technology to support UDL. Given our commitment to reach educators and their desire for practice-based solutions, we also sought to engage an innovative local educator who could illustrate concrete ways of leveraging technology in the UDL approach with students. Brian Gadus of the Palo Alto Technology Collaboration Hub within Palo Alto Unified School District joined us to present his experiences and examples of UDL in K-12 classrooms.

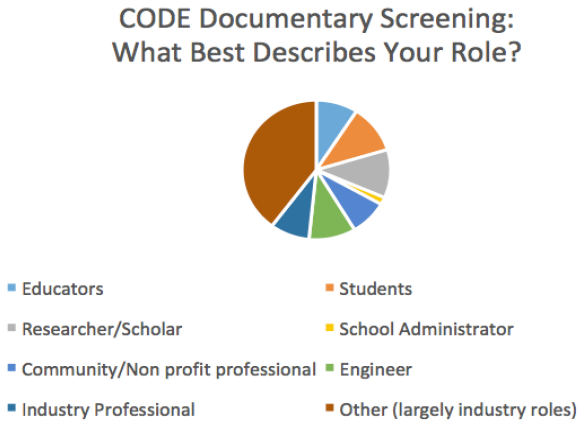


The event had an audience of approximately 100. Data from the RSVP survey shows a mixture of practitioners, researchers, non-profit professionals, students, and others: 22% PreK-12 educators, 18% community/ non-profit, 17.5% researcher/scholars, 18% students, 4% school administrators, as well as 30% “other” that included members of the educational technology industry, library professionals, and adult education professionals.

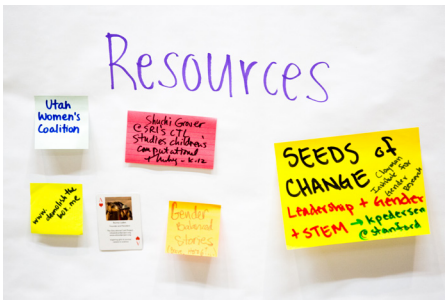
Gender equity in technology fields: Screening and panel discussion of CODE: Debugging the Gender Gap (May 8, 2017)

Issues of gender equity in computer science and engineering surfaced throughout our 2016 Equity by Design seminar. The recent documentary Code: Debugging the Gender Gap addresses many of the challenges that arise both in creating better access for girls to develop CS interests and skills, as well as support for female engineers as they navigate the workforce.

The TELOS event featured a screening of the full-length documentary followed by a panel of leaders in the area of gender and technology: Alexandra Diracles, CEO of VidCode, Gillian Scott, Director of TechWomen (US Department of State), and Alaina Percival, CEO of Women Who Code. The post-session reception featured an "inspiration wall" where attendees were encouraged to post innovative solutions to the challenges that were discussed.



Interest in the event was very high and approximately 80 people attended. Those who RSVP'ed were 9% Educators, 11% students, and 11% researchers/ scholars. The majority of the remaining respondents were industry professionals (engineers, product managers, etc. [several respondents replied "other" and filled in their professional titles/roles]). The Clayman Institute at Stanford promoted the event and generated much interest among women working in technology fields.



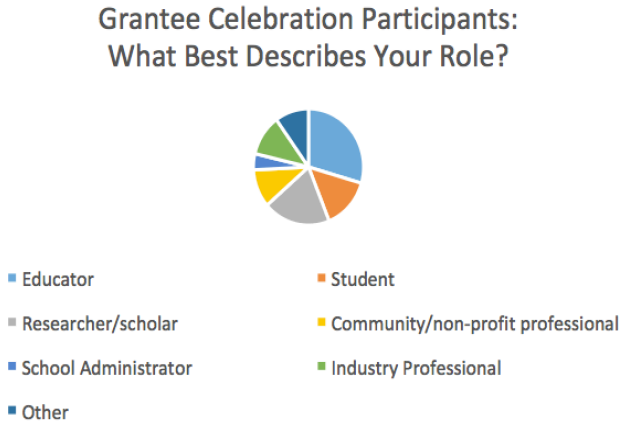
TELOS Celebration: Keynote Address and Grantee Exhibit Fair (June 5, 2017)

On June 5, 2017, TELOS hosted a convening to celebrate and share the first year of funded projects.

The event featured a keynote address by TELOS grantee and GSE professor Sam Wineburg, along with collaborators Sarah McGrew (GSE doctoral student) and Will Colglazier (teacher and STEP alumnus).

Following the talk, an exhibit fair featured 13 other TELOS projects by GSE faculty and students that were funded in 2016. Topic areas included science education, mathematics teaching, gaming in classroom instruction, literacy, academic support in rural China, peer tutoring, among others.

Approximately 110 participants attended the talk and exhibit fair, representing a variety of roles including teaching, research, industry, and students. Of the 150 RSVPs that were received, 29% indicated they were educators, 14.5% students, 19.8% researchers, 11.5% industry, and a diverse range of roles listed in "other."



Bright Futures Conference (in Partnership with Redwood City School District)

McKinley Institute of Technology
Middle School, Redwood City
May 6, 2017

TELOS partnered with Redwood City School District to support the Bright Futures conference, an event highly synergistic with the TELOS mission. TELOS team members presented four sessions at the conference. TELOS also made scholarships available to allow 12 STEP and 10 GSE students to attend.

Event Description:

The Bright Futures forum offered Bay Area teachers, administrators, and thought leaders in educational technology a venue to:

- Learn and share about ways to close the digital divide and integrate technology in purposeful ways,
- Hear about the newest educational research from Stanford professors with TELOS,
- See how teachers are integrating technology into their curriculum to support a range of students - from GATE to Long Term English Language Learners,
- Join in conversations with panels from the tech industry, educational leadership, and academic research,
- Try a hands-on workshop where you get to make and take a new idea to use right away, and
- Discover helpful resources from the San Mateo County Office of Education and other organizations.

TELOS team presentations included:

Brigid Barron

- PANEL: Opportunities and Challenges Around Equity and Access to Technology for Learning
- Creating (and Lighting Up) a Map of Your Technology Learning

Amber Levinson

- Enlaces: Technology as a link between home and school for Latino immigrant families

Molly Zielezinski

- Keynote: A Case, Place & Time for Disruptive Innovation

Next Steps: Activities for 2017-2018

In the 2017-2018 academic year, TELOS is continuing work on all four central goals. Key activities will include:

- A new round of funding for GSE faculty and student projects
- FamLAB Innovation Lab event in November 2017
- Continuing work with pre- and in-service educators
- Work to advance computational thinking opportunities at the GSE
- TELOS-driven research with local school districts in underserved communities
- Quarterly TELOS convenings including:
    - Symposium on Learning Across Boundaries
    - Spring convening on Computational Thinking
    - Book signing: Allan Collins *What's Worth Teaching? Rethinking Curriculum in the Age of Technology*

Technology for Equity in Learning Opportunities

at Stanford University

Annual Report
2016-2017 Academic Year

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