Learning Differences Initiative

Innovating breakthroughs that improve solutions for learners with (dis)abilities.

THE CHALLENGE

In 1974, Congress passed a federal law establishing the right to a free and appropriate public education for children with learning differences. Since then, access and opportunities to learn have improved, yet families and their children still experience denial to access, mis-categorization, imprecise instruction, and inadequately prepared teachers.

Today, approximately 13% of children in the U.S. are identified for special education services, using the 13 categories from federal law. These range from speech or language to social and emotional needs to learning and intellectual (dis)abilities*. The categories and their definitions are not necessarily shared across disciplines like psychology, neuroscience, and medicine. It would be valuable to refactor and align these with current evidence to improve consistency and minimize misidentification of children.

Structural and implicit biases in educational systems further mis-categorization of disadvantaged students based on their race, English competency, access to health care and early learning and life experiences. Often, these factors impact when, how, and why some groups of students are more likely to be identified for special education services, and they unfairly impact disadvantaged students most in need of an effective education.

Across the U.S., 95% of teachers have had students identified for special education services or accommodations in their classrooms. Many lack the knowledge and skills needed to design and assess learning for the wide range of students they teach. Special educators are prepared to offer learning supports in collaboration with their general education colleagues, but 48 states report severe shortages of special educators. This limits the potential for personalized and empowering educational opportunities. Individuals with learning differences continue to be stigmatized, underserved and excluded, rather than supported through improved approaches to teaching and inclusion. Dismal graduation rates and limited post-secondary options translate into under-employment and lifelong limitations.

Special education research has historically been siloed with minimal sharing between psychiatry, education, neuroscience, learning sciences, technology, humanities, and policy. There is a shortage of innovative solutions that draw upon multiple disciplines, despite the catalytic potential of new technologies. Moreover, there are relatively few studies examining special education services, tools, and their impact on practice and outcomes. Only a handful of major research universities are working on interdisciplinary discovery and development.

Some scholars use the term "(dis)ability" to signal that the identification of a disability can be the result of a social construction, and not simply an individual quality. A child diagnosed with dyslexia in English, for example, may do well with other writing systems. Hostile attitudes and environments can lead to disproportionate mis-categorizations that follow children through a lifetime.

OUR VISION

All children and adults should have the opportunity and means to participate fully in life. The initiative for Leaning Differences and Special Education will create breakthroughs that significantly improve opportunities for children with diverse learning needs to participate and learn in school and life. Through interdisciplinary collaboration, we will become a global leader in advancing discovery, designing inclusive solutions, preparing educators, cultivating leaders, and mobilizing knowledge to create lives of welcome engagement.

We need to shape policy towards emerging possibilities and gather large scale longitudinal data to support fundamental discovery and evidence-based decision making in the future. Additionally, all stakeholders will benefit from rapid communication of new knowledge and effective designs as we build knowledge together.

When we create solutions for people with learning differences, the outcomes can benefit all learners. Solutions that enable students with learning differences to be incorporated into classrooms enrich their peer's conceptions of difference, acceptance, and respect. Moreover, children categorized with a learning difference are, in reality, on a continuum that includes all learners. Currently, most children receive an early reading curriculum that was originally designed for children with exceptional reading challenges. Understanding and solving for the edge cases benefits all the cases.

WHY STANFORD?

At Stanford, many faculty and groups are committed to, and actively working in the area of special education and learning differences, but they often do not interact. From faculty in the School of Medicine that run summer programs for the hearing impaired, to the Law school that provides direct services to families struggling to access services, to the Graduate School of Education's research on how dyslexia manifests itself in neural pathways, there is a widespread commitment to advancing opportunities for children with learning differences. The field of learner differences is relevant to every discipline and connecting expertise will bring new energy, insights, and impacts.

Collaboration across disciplines is needed to advance understanding of diverse learning paths and to design effective tools, strategies, and training. Recent advances in neuroscience, data collection and analysis offer new opportunities to advance knowledge, while progress in

Stanford researchers partner with a local school to understand brain development

technology, artificial intelligence, and contextual analysis can render scientific advances into effective solutions. People once thought that the structures of the brain were relatively fixed, but Stanford faculty, working across neuroscience and education have recently revealed stunning plasticity in the brain's wiring when driven by effective instruction.

Stanford collaborations among pediatrics, artificial intelligence, education, and psychology are unlocking the critical role of play in social development, while they are also creating assistive technologies that help children with spectrum disorders gain real-time emotional information about their play partners. Stanford faculty with expertise in classroom dynamics, special education policy, and learning cultures are creating ways for children to learn academic content shoulder-to-shoulder with their peers in a classroom ecosystem that permits personalization and inclusion. The possibilities are tremendous.

With strength across disciplines and an infrastructure for cross-disciplinary collaboration, Stanford is uniquely poised to transform a field in need of breakthroughs. While Stanford has faculty working on learning differences, the university does not have a formal program in special education. This is fortunate. In the nation's research landscape of siloed intellectual ownership of learners with special needs, Stanford can create a greenfield approach that is interdisciplinary at its core. We will build bridges: among the disciplines; through research, practice, and policy; and, across the many contexts in which people participate and learn.

The initiative evolved from the report of a task force comprising faculty members from across campus. We have since hired six new faculty specializing in artificial intelligence, technology, behavioral neuroscience, policy,

classroom practices, and humanities. The faculty joined Stanford because of its bold new vision of an interdisciplinary approach to learning differences. It is Stanford's remarkable openness to interdisciplinary work that offers scholars and students opportunities to forge new frontiers.

OUR PLAN

This initiative will explore the complex array of factors underlying learning differences and develop learning designs to afford learner, educator, and system transformation. We believe Stanford can accelerate the pace of discovery and innovation in multiple arenas. Already, faculty are finding collaborators to work on significant goals that include developing actionable assessments for teachers; uncovering the neural trajectory of intensive remediation in math and reading; designing state-of-the-art inclusive instructional practices; implementing intelligent assistive technologies; delivering evidence-based policy recommendations; identifying the factors that lead to marginalization; and evaluating literacy interventions.

Themes

Our focus includes four key areas of work:

Breakthrough Science and Design – We will foster collaborative educational research to advance educational practice and outcomes, social policy, care giving, and public service. Our research will focus on:

- *Design for inclusive teaching and learning* – Researchers will expand inclusive practices and engage students and teachers in ongoing inquiry cycles to improve learning on-the-spot.
- *Harness neuroscience to understand what works and why* – Researchers in behavioral neuroscience will collaborate with faculty who design learning experiences to understand how the brain changes with exposure to math and reading instruction, and which aspects of instruction have the greatest long-lasting impact and why.
- *Develop personalized learning and assistive technologies* – Researchers will combine new possibilities of hardware and artificial intelligence to create technologies tuned to the needs of individual children for assistance and learning.
- *Create a longitudinal database* – Researchers will develop new assessments and identify existing measures that are precise and effective characterizations of individuals and the contexts they inhabit. They will be built into the architecture of a new database that can dramatically advance understanding of the manifold trajectories of children with (dis)abilities.

Inclusive Education Leaders – Through graduate training and professional education, the initiative will prepare current and future leaders. Preparation and continuing development programs will include best practices across learning ecologies including schools, corporations, health care, and local community government. The initiative will host professional development training for leaders in school systems, non-profits, and other groups.

Transform Policy – The initiative will engage key policy groups at the local, state, and federal level to advance systemic shifts in education policy. We will work collaboratively with policy makers, communities, and providers to address policy gaps and inconsistencies that impact the educational and life opportunities of individuals with (dis)abilities. Products and outcomes include: 1) thematic and timely policy briefings to guide advocacy groups, policy makers, and the public; 2) briefings on evidence-based designs and solutions; 3) data sharing; and 4) analysis of current systems, learning supports, and policies.

Mobilize Knowledge – The knowledge mobilization effort will translate and disseminate research, pedagogy, and policy findings into effective and impactful curriculum, instructional practices, and tools to amplify and sustain educational impact across PK-16 educational platforms. We will engage and connect various state, national, and international communities of scholars, practitioners, policy makers, and educators working to advance human capacities.

Outcomes

The challenges of learning differences cannot be understood or solved in single stroke. The work requires breakthroughs on multiple fronts, steady incremental

improvements, and the efforts of many. Key outcomes include:

- Produce foundational knowledge on the neural and social mechanisms that shape learning.
- Catalyze creative, ambitious, and transformative interdisciplinary research.
- Develop tools, strategies, and guidance that facilitates inclusive practices, personalized learning, literacies, assessments, and peer-to-peer, educator-to-peer, and educator-to-educator learning infrastructures.
- Scale effective interventions in collaboration with partners and stakeholders.
- Develop partnerships between different systems and providers that individuals with learning differences and their families.
- Develop model training programs in learning differences for current and future leaders.
- Transform local and national policies through research-based guidance
- Make measurable progress in reducing disparity - create effective, equitable, and accessible solutions for learners and educators needing them most.

NEXT STEPS

Over the last 18 months, we convened an interdisciplinary faculty team and spoke with nearly 200 Stanford researchers, policy makers, senior experts in the field of learning differences, families, educators, and industry leaders about pathways to a better future for all learners, and we have listened. Based on these conversations, we identified a preliminary workflow to lay the groundwork for scalable, sustaining impact in the key areas of focus. Over the coming year, we plan to:

Catalyze interdisciplinary Stanford research – We will continue to host bi-weekly meetings with a core, interdisciplinary faculty team to develop and guide implementation strategies. In winter 2021, we will award seed grants to interdisciplinary faculty working in partnership with schools, NGOs, and other groups focused on learning differences research with the potential for impact and scale.

Launch a publicly accessible cross-sector data infrastructure project – We will award funding to faculty interested in proposing and testing measures that could be included in a comprehensive, cross-sector longitudinal database. The goal is to galvanize engagement in a future publicly accessible database, where any group may submit data sets for review.

Help junior faculty develop their interdisciplinary agenda – We will develop mechanisms to support junior faculty interested in exploring interdisciplinary work. Potential programs include a post-doctoral program, where the post-doctoral scholar is jointly appointed to a junior and senior faculty member in different campus units. Or, the creation of an incubator program that brings faculty together in a multi-day facilitated program. The end goal is to produce a joint research proposal that will be funded by a launch fund within the initiative.

Launch fellowship and in-residence program – We will create and host an inaugural event for a cross-campus fellows program to promote interdisciplinary connections in research and teaching. We will launch a search for a FY22 In-Residence position for an accomplished, external, interdisciplinary scholar to collaborate with faculty and students on innovative approaches to research, practice, and/or policy efforts in the field of learning (dis)abilities and inclusive education.

Host convenings to advance research, practice, and policy efforts – Through the end of 2020, we will wrap up a three-part virtual convening and design workshop with San Jose families, San Jose educators, Stanford GSE students and faculty, and Silicon Valley Technology companies. The goal is to identify opportunities for technology disruptions that can meaningfully improve distance learning for students with learning differences and all students. In the winter of 2021, we will host a two-day networking and research design marathon for our intra-Stanford network of faculty and scholars as a pre-cursor to issuing a call for interdisciplinary research proposals. In the spring, we will host key stakeholders across disciplines and practice areas to co-produce policy briefs and lay the path for a successful reauthorization of the Individuals with Disabilities Education Act. And in the fall, we will host a large-scale, international convening engaging the most forward-thinking scholars, practitioners, policy makers, and educators from across the globe working to advance human capacities, educational designs, and governing and support systems for students with learning differences. This convening will highlight model efforts in the field that attendees can use in their own programs.

Design a next-gen inclusive educator development program – We will convene a task force to assess national inclusive educator development credentialing, certificate, and development programs. The task force will identify best practices and make final recommendations in the spring of 2021 for a Stanford credentialing, certificate,

and/or development program.

Advance inclusive school partnership work – We will continue building our Inclusive Schools Collaborative with local schools to advance their practices and provide Stanford Teacher Education Preparation (STEP) students with sites for pre- and in-service work. In the winter and spring of 2021, we plan on formalizing a research practice partnership with the Sequoia school district which will launch an inclusive school site in the fall of 2021. We will implement a student-inquiry project, engaging students and teachers in developing, implementing, and improving lessons to create more inclusive and equitable classrooms. We will work collaboratively with practitioners, students, and education leaders in order to co-construct new forms of knowledge while directly impacting learning in classrooms.

ACADEMIC LEADERS

LEADERSHIP CO-CHAIRS

Elizabeth Kozleski, Professor of Education, GSE
Ira Lit, Associate Professor (Teaching); Faculty Director, STEP Elementary Teacher Education Program, GSE

FACULTY ENGAGEMENT

Subini Annamma, Associate Professor of Education
Alfredo Artiles, Professor of Education
Nicholas Haber, Assistant Professor of Education, Computer Science
Heidi Feldman, MD, Ballinger-Swindells Endowed Professor in Developmental and Behavioral Pediatrics
Bill Koski, The Eric and Nancy Wright Professor in Clinical Education, Stanford Law
Chris Lemons, Associate Professor of Education
Bruce McCandliss, Professor of Education,
Ray McDermott, Professor Emeritus of Education
Rebecca Silverman, Associate Professor of Education
Guillermo Solano-Flores, Professor of Education
Brian Wandell, Isaac and Madeline Stein Family Professor, Psychology
Jason Yeatman, Assistant Professor of Education and Pediatrics

Plans articulated here may undergo further refinement.

DEVELOPMENT CONTACT

Christen Sottolano
Director of Major Gifts, GSE
csotto@stanford.edu