

# Notes of the Expert Panel Meeting Representing Futurists

## June 21, 2018

### National Assessment Governing Board

#### *Ad Hoc* Committee on Measures of Postsecondary Preparedness

As one step in addressing the charge of the *Ad Hoc* Committee on Measures of Postsecondary Preparedness, HumRRO organized and facilitated a meeting with a select group of futurists.<sup>40</sup> The purpose of this meeting was to elicit input from thought leaders regarding the future of postsecondary education and work.

We were fortunate to assemble an exceptional panel of visionaries with a variety of perspectives. The panel members included **Randy Bennett**, Educational Testing Service; **Karen Cator**, Digital Promise; **David Conley**, EdImagine; **Alana Dunagan**, Clayton Christensen Institute; **Devin Fidler**, Rethinkery Labs, and **Nancy Lue**, Advanced Education Research and Development Fund on behalf of the Chan Zuckerberg Initiative and the Bill & Melinda Gates Foundation. Also, in attendance were several Governing Board members, Governing Board staff members, and HumRRO staff.

The meeting was held on June 21, 2018 in San Francisco, California. An overview of the National Assessment Governing Board and the charge of the *Ad Hoc* Committee on Measures of Postsecondary Preparedness, a “facebook” of attendees with brief biographic summaries, along with the agenda and logistical information for the meeting were sent to the panelists in advance of the meeting. Appendix A contains the agenda, list of attendees, and panelist biographies.

Terry Mazany, *Ad Hoc* Committee Chair, welcomed the futurists and set the stage for the role of NAEP in the future, given the impact of technology on work as well as the economic and global context in which students enter the postsecondary world. He led the attendees through introductions. Thanos Patelis (HumRRO) reviewed the agenda and stated the goals for the meeting.

To establish the perspectives of these varied experts, each panelist provided a 10-minute presentation of their initial thoughts regarding five discussion questions: (a) what are the trends you see that will define the future of learning and schools? (b) what are the trends you see that will define the future of work and the skills that will be most valued by employers of the future? (c) what are the most promising technologies that will redefine education? (d) what things are most likely to disrupt how we think about teaching and learning? and (e) what are the trends that most concern you, and why? Copies of the presentation slides are in Appendix B.

Following the presentations, Thanos Patelis facilitated deeper discussion about common themes and the five questions. Finally, Terry Mazany offered some concluding comments.

The purpose of this document is to summarize the themes and comments made by the panelists. The information in this report is meant to provide insight into the rich conversation and comments provided by the expert panelists.

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<sup>40</sup> Although some panelists would not describe themselves as “futurists,” per se, their careers all include the identification and evaluation of trends, as well as forecasting future conditions or developments.

## *Presentations*

**Randy Bennett** described seven trends in the future of learning.

- Learning is increasingly technology-based with complex tasks (e.g., simulation and games).
- Materials and methods used in learning are only now catching up with cognitive science.
- Learning is more person-based, adaptive, and customized on different dimensions, to (a) allow accessibility to make learning more available to students with diverse learning types, (b) personalize in terms of competency level, (c) engage students effectively, and (d) give students greater agency over their learning goals.
- New constructs and competencies, such as socioemotional learning, citizenship and citizen engagement, and cross-cultural competency, are becoming more prevalent.
- Prior knowledge is critical when learning new information or developing new skills.
- There is a focus on cross-disciplinary skills such as communication and problem solving. However, contextual differences within disciplines are important considerations (e.g., problem solving in art differs from problem solving in science).
- Assessment embedded in instruction with automated analysis and feedback, allows for adjustment of instruction.

In addition to trends in the future of learning, Dr. Bennett described two trends of most concern.

- Personalization – There is concern that personalization could be used to exacerbate as much as ameliorate differences in opportunities and learning. For example, students from underrepresented groups could be routed toward basic skills classes.
- Embedding assessment in instruction – There is potential for embedded assessment in instruction for student learning, however conflating assessment for learning with assessment for accountability could be problematic, especially if used to make policy judgements.

**Karen Cator** provided the following perspectives regarding the five questions:

- Trends in the future of learning include: (a) personalization to accommodate variability in students through learning science, (b) more flexible learning to obtain and demonstrate competency, and (c) performance-based assessments leading to credentials for the changing global workforce.
- Trends in the future of work and skills include artificial intelligence (AI) which has the potential to disrupt many jobs. Employees will need deeper learning skills such as collaboration and social emotional skills. We should focus on what is uniquely human.<sup>41</sup>
- Technology can be used to augment human performance. For example, data from embedded assessment and improved diagnostics can provide more precise and accurate analyses of student knowledge and performance, helping teachers perform more effectively in the classroom.
- Learning science could be disruptive. People will have jagged profiles—different levels of competence across skills—based on individual differences and the contexts in which they apply the skills.

<sup>41</sup> Ms. Cator recommended Jack Ma's presentation at the World Economic Forum on The Way We Teach; <https://www.youtube.com/watch?v=pQCF3PtAaSg>.

- Most concerning is disenfranchisement of teachers. As an example, one-third of current teaching jobs in St. Louis are vacant. Other areas of concern include limited resources in schools, increasing cost of higher education, limitations of current assessments, equity of access to quality learning activities, and the digital learning gap.

**David Conley** shared the following insights regarding the five questions:

- The future of learning includes the following trends: (a) taking the teacher out of the bottleneck role, thereby allowing students to work at their own pace and receive just-in-time learning; (b) providing more social learning; (c) using technology to identify learning patterns to personalize learning; and (d) focusing on adapting skills to accommodate changes in work rather than learning fixed skill sets.
- Trends in the future of work and skills include changes such as (a) gig work versus long-term careers, (b) continued adaptability, (c) hiring at low- and high-skill end with less at the middle-skill level, (d) global work teams while living locally, (e) increasing service work, and (f) standardization versus bespoke work (see jagged profiles as mentioned by Ms. Cator).
- Promising technologies in education are adaptability, including a wider variety of students, specialized job/task-specific reading, and web-based learning.
- The following may contribute to disruptions in teaching and learning: (a) students having more agency over their learning, (b) basic skills taught in context using simulations or serious games such as used in the military and medical training, (c) self-directed learning will require resources for teachers to help students who have trouble directing their own work, and (d) emphasis on career preparation with certifications and badges over liberal arts education.
- The three most concerning trends are (a) equity in education, (b) equity in defining preparedness, and (c) increasing the pace of disruptive economic change.

**Alana Dunagan** offered the following insights:

- The future of learning and work includes the following trends:
  - increased online learning in higher education and K-12
  - learning not requiring a terminal degree (e.g., a certification)
  - workforce alignment of education
- Higher education institutions are seeing falling enrollment, while training in specific skills matters more. She described the parallels between disruptive innovations in education and in business. She explained that corporate bankruptcy following implementation of disruptive technology occurs when companies do not adapt by using technology to expand the reach of their services (i.e., they continue serving the same set of customers rather than expanding their customer base); Blockbuster is an example of this situation.
- Jobs requiring higher education are growing twice as fast as jobs that do not, because of disruption by the education technology market. Innovators in the education technology space are developing partnerships with employers and creating new ways of offering higher education providing the needed training.
- The biggest concern in education and work is the prestige-based model of signaling competence (i.e., a degree from an elite university is highly valued over a degree from a lower tier school without regard to a student's actual knowledge and skill). This model ignores the skills a student has and does not include employers in identifying the skills that students should learn. A better model would engage businesses in identifying skill

needs, offer education aligned to workforce needs, and provide students with evidence of skill attainment and a means for submitting that information to employers.

**Devin Fidler** provided a historical perspective to inform the following trends:

- The history of change in organization strategies evolved from guilds to industrialization to manufacturing/assembly to digital. The advent of the World Wide Web facilitated communication and has expanded to commerce and coordination.
- Examples of using technology to speed up work include peer to peer applications such as TaskRabbit, Gigwalk, and Upwork. These platforms have millions of people enrolled to offer their services with qualifications based on past performance. Employers can use these applications to identify well-qualified candidates with the appropriate skills mix and a history of positive reviews; employees can use these applications to find jobs and to see what skills are in demand.
- The most promising technologies are using organization technologies in education technology with artificial intelligence.
- Disruption will come from small innovative organizations who are more nimble than large businesses.
- The biggest concern is the stereotype that organization is dehumanizing; however, organization can expand human capability.

**Nancy Lue** identified the following education megatrends:

- Return on education (i.e., value of education) is similar to an internal rate of return (IRR), a term very popular in Silicon Valley to evaluate whether to invest in something. In 2015, 50% of college graduates were working in fields they did not study in school, and more than a third indicated they would study different subjects if they had the opportunity to do it all over again. In a 2013 survey, nearly 40% of college graduates indicated university did not prepare them for employment. Meanwhile, companies and non-profit organizations (e.g., Coursera, EdX, Khan Academy) offer courses for free or with a credential for \$100. General Assembly boasts a 98% success rate in securing jobs or promotions within six months for their graduates.
- Continuous learning (e.g., Kaizen education) offers an opportunity for adults to keep up with education. Millennials are projected to have 15 careers in their lifetimes so this ongoing education is important. Coursera's MOOC "Learning How to Learn" has been highly successful, with over half a million "alumni."
- Technology provides opportunities for ongoing learning. Video games are one venue for learning. One way to get people interested in education is to make the best (aka, "rock star") teachers available through technology.
- Knowledge increasingly can be seen as currency (e.g., micro-credentials, badges). The degree-driven, prestige-driven education system isn't meeting the needs of modern society. "What you know" is becoming more important than "where did you go." Individuals can curate a portfolio of skills evidenced by micro-credentials, etc.
- Big data and smart data provide an opportunity to use data to personalize learning (Dreambox, Knewton, etc.).
- Mobile technology learning applications are widely available. Today, 90% of high school and college students own a smart phone, and time spent on smart phones is increasing. Smart phones are providing opportunities to learn in small bits of time as well as in dedicated sessions.

- Mind, body, and soul: Breakthroughs in brain research and cognitive science are being incorporated into learning. Evidence is mounting that physical fitness, happiness, diet, overall wellness, and mindfulness (e.g., Goldie Hawn’s MindUp program) are associated with successful learning.
- Equity is the greatest concern and pervades all of the trends. For example, education technology has costs which limit access. While mobile technology is available to many, ten percent of students do not have smartphones.

### **Discussion**

Thanos Patelis (HumRRO) facilitated a deeper discussion among panelists about common themes and the discussion questions.

*Personalized learning.* Content can be tailored to student preparation, interest, and ability. Learning will feel more purposeful, connected, and relevant. Fewer students will be seated in rows in classrooms on a rigid schedule. In high school, students may enroll in work training programs or participate in micro-internships. Teachers will serve as mentors. There is a need to change the traditional school organization/culture and provide teachers with the knowledge and skills to educate students in a new environment.

*Contextual data.* Is a student goal-focused or not? Using data about students’ goals can improve instruction. Contextual data (e.g., goals, interests, self-confidence) may provide clues as to why a student might be struggling and may also provide insights to inform how to individualize instruction.

*Equity.* Opportunity to learn pervades multiple areas. Cost and availability can be barriers to access educational technology and higher education.

*Big data.* Educational technology generates a lot of data. Educators need to learn how to analyze and use the data, taking a data systems point of view. Also, there is a need to teach teachers how to capture and document performance data on what students are doing in the classroom and how to use those data to improve classroom instruction and activities.

*Data dashboards.* Data dashboards can connect data from different sources, interpret multiple data points, and provide evidence of what students can do (versus cannot do).

*Micro-credentials.* Micro-credentials can be used by students and teachers. Students could earn a micro-credential when mastering a concept. Teachers can use their students’ micro-credentials to identify the skills acquired and those that need to be taught or re-taught.

*Competency assessments.* Students would benefit from measures of job-related skills to show their potential and demonstrate performance capabilities, particularly if the measures do not correlate to student background. Employers benefit because they have evidence of a job candidate’s skills. Educators can use competency data to mentor students on achieving goals.

## **Panelist Recommendations**

As a wrap-up exercise, Thanos Patelis asked each panelist to make one recommendation for the Governing Board to consider.

**Randy Bennett** – Use NAEP’s national probability sample to describe what instruction is like at different levels for different types of students (e.g., students with disabilities, socioeconomic status) across time.

**Karen Cator** – Work toward a more coherent assessment system across NAEP and states.

**David Conley** – Endorse the work of the *Ad Hoc* Committee with a longer-term vision for NAEP to be bold in creating better items and measuring traditional content with greater precision.

**Alana Dunagan** – Develop innovative methods to measure flexibility, problem solving, and non-traditional skills that people will need in the future.

**Devin Fidler** – Look at partnering with prestigious organizations within the learning space that function outside of formal assessment, such as skunk works and incubators.

**Nancy Lue** – Use NAEP to assess the technology gap and equity issue in technology use outside of the classroom.

## **Reflections**

Terry Mazany expressed his appreciation for the panelists’ insights. He noted that each expert presented similar ideas through a different lens; while this might have seemed repetitive, it actually reinforced the conclusions. The panelists convinced him that traditional education enterprise is collapsing in slow motion. Innovation outside of education is occurring at an accelerating pace. Learning might occur in smaller units such as micro-credentials.

Mr. Mazany discussed the high cost of traditional higher education and the trillion-dollar impact of student debt on the economy. He acknowledged the existence of prestige-based signaling that maintains inequity in the system. These are complex and challenging social issues. NAEP may be able to be a market signal by Governing Board priorities regarding what to measure and report on. He opined that perhaps NAEP can reinforce that prestige alone is not the gold standard.

## Appendix A: Meeting Agenda, Attendees, and Panelist Biographies

### Futurist Expert Panel

Thursday, June 21, 2018 1:00 pm – 4:00 pm PT

Room: Cypress A \* Hyatt Regency San Francisco Airport  
1333 Bayshore Highway \* Burlingame, California, USA, 94010

#### Agenda

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1:00 – 1:15 pm Welcome, Introductions, and Overview of the Ad Hoc Committee  
*Terry Mazany, Chair of the Ad Hoc Committee on Measures of Postsecondary Preparedness*

Overview of the Agenda and Goals for the Meeting  
*Thanos Patelis, HumRRO*

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1:15 – 2:45 pm Panelist Perspectives and Initial Thoughts Regarding the Discussion Questions

*A series of ten-minute presentations, each followed by a five-minute Q&A.*

1:15 – 1:30 Randy Bennett (*Educational Testing Service*)

1:30 – 1:45 Karen Cator (*Digital Promise*)

1:45 – 2:00 David Conley (*EdImagine*)

2:00 – 2:15 Alana Dunagan (*Clayton Christensen Institute*)

2:15 – 2:30 Devin Fidler (*Rethinkery Labs*)

2:30 – 2:45 Nancy Lue (*Advanced Education Research & Development Fund*)

*Questions for Discussion:*

1. What are the trends you see that will define the future of learning and schooling?
  2. What are the trends you see that will define the future of work and the skills that will be most valued by employers of the future?
  3. What are the most promising technologies that will redefine education?
  4. What things are most likely to disrupt how we think about teaching and learning?
  5. What are the trends that most concern you, and why?
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2:45 – 3:45 pm Panel Discussion  
*Facilitated by Thanos Patelis*

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3:45 – 4:00 pm Final Reflections  
*Terry Mazany*

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*Conducted in Support of the National Assessment Governing Board's  
Ad Hoc Committee on Measures of Postsecondary Preparedness*

## *Attendees*

### **Expert Panelists:**

- Randy Bennett, Norman G. Frederickson Chair in Assessment Innovation in the Research & Development Divisions, Educational Testing Service
- Karen Cator, President and CEO of Digital Promise
- David Conley, President, EdImagine
- Alana Dunagan, Researcher for Higher Education, Clayton Christensen Institute
- Devin Fidler, Founder, Rethinkery Labs
- Nancy Lue, Co-Lead, Advanced Education Research & Development Fund

### **Governing Board Members:**

- James Geringer, former Governor of Wyoming
- Carol Jago, Associate Director, California Reading and Literature Project at UCLA
- Terry Mazany, Chair, *Ad Hoc* Committee on Measures of Postsecondary Preparedness
- Dale Nowlin, Teacher and Mathematics Department Chair, Bartholomew Consolidated School Corporation, Columbus, Indiana
- Linda Rosen, former Chief Executive Officer, Change the Equation, Washington, DC
- Chasidy White, Director of Strategic Initiatives, Office of the Superintendent, Montgomery, Alabama

### **Governing Board Staff Members:**

- Michelle Blair, Assistant Director for Assessment Development
- Bill Bushaw, Executive Director
- Lisa Stooksberry, Deputy Executive Director
- Lily Clark, Assistant Director for Policy & Research

### **HumRRO Staff Members:**

- Monica Gribben, Senior Staff Scientist
- Sunny Becker, Principal Staff Scientist
- Thanos Patelis, Principal Scientist

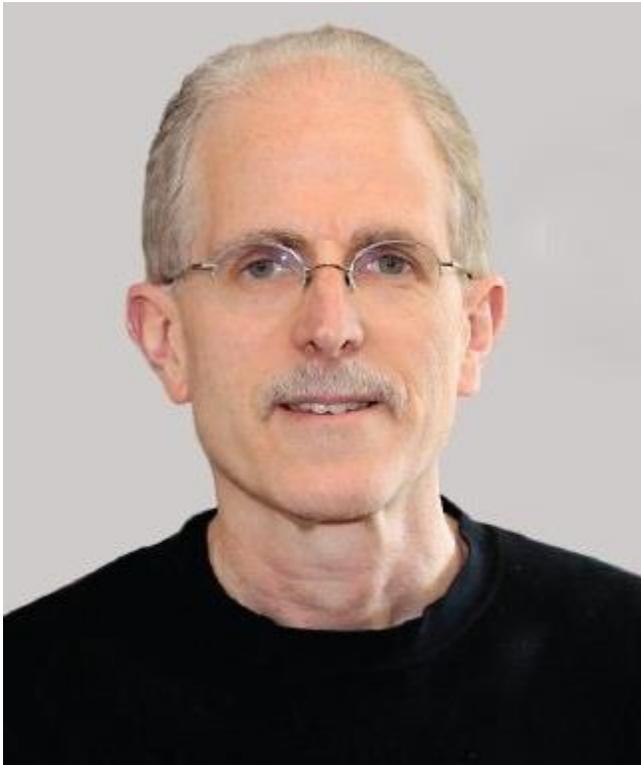
# Ad Hoc Committee Meeting on Postsecondary Preparedness

## *Panelist Biographies*

Randy E. Bennett Ph.D. ....	55
Karen Cator .....	56
David Conley, Ph.D.....	57
Alana Dunagan .....	58
Devin Fidler.....	59
Nancy Lue.....	60

**Randy E. Bennett Ph.D.**

Norman O. Frederiksen Chair in Assessment Innovation in the Research & Development Division Educational Testing Service



Randy E. Bennett is Norman O. Frederiksen Chair in Assessment Innovation in the Research & Development Division at Educational Testing Service in Princeton, New Jersey. Bennett's work has focused on integrating advances in cognitive science, technology, and educational measurement to create approaches to assessment that have positive impact on teaching and learning. From 1999 through 2005, he directed the NAEP Technology Based Assessment project, which included the first administration of computer-based performance assessments with nationally representative samples of school students, and the first use of "clickstream," or logfile, data in such samples to measure the processes used in problem solving. From 2007 to 2016, he directed an integrated research initiative titled, *Cognitively-Based Assessment of, for, and as Learning* (CBAL), which focused on creating theory-based summative and formative

assessment intended to model good teaching and learning practice. Randy Bennett is president of the International Association for Educational Assessment (IAEA) (2016-), an organization primarily constituted of governmental and non-governmental nonprofit measurement organizations throughout the world, and immediate past president of the National Council on Measurement in Education (NCME) (2017-2018), whose members are individuals employed primarily in universities, testing organizations, state education departments, and school districts. He is a Fellow of the American Educational Research Association.

**Karen Cator**

President and CEO of Digital Promise



Karen Cator is President and CEO of Digital Promise and a leading voice for transforming American education through technology, innovation and research. From 2009-2013, Karen was Director of the Office of Educational Technology at the U.S. Department of Education, where she led the development of the 2010 National Education Technology Plan and focused the Office's efforts on teacher and leader support. Prior to joining the department, Cator directed Apple's leadership and advocacy efforts in education. In this role, she focused

on the intersection of education policy and research, emerging technologies, and the reality faced by teachers, students and administrators. She began her education career in Alaska as a teacher, ultimately leading technology planning and implementation. She also served as Special Assistant for Telecommunications for the Governor of Alaska. Cator holds a master's in school administration from the University of Oregon and received the 2014 College of Education Distinguished Alumni award. The American Association of Publishers has awarded Cator with the 2014 Visionary Award. She received her bachelor's in early childhood education from Springfield College and received the 2015 Distinguished Alumna award. She is an Aspen Pahara Fellow, the past chair for the Partnership for 21st Century Skills and has served on boards including the Software & Information Industry Association-Education.

**David Conley, Ph.D.**

President, EdImagine

Professor of Educational Policy and Leadership in the College of Education at the University of Oregon

Director, Center for Educational Policy Research



David Conley is Professor of Educational Policy and Leadership in the College of Education at the University of Oregon where he directs the Center for Educational Policy Research. He is the founder and president of EdImagine, an educational strategy consulting company. Additionally, he founded and served for 12 years as CEO of the Educational Policy Improvement Center, EPIC (now Inflexion). He recently completed an appointment as Senior Fellow for Deeper Learning under the sponsorship of the Hewlett Foundation.

Dr. Conley is a national thought leader in the areas of college and career readiness, student ownership of learning, systems of assessment, educational accountability, and the future of education and the economy. He

has published multiple articles and policy briefs as well as three books in these areas. His most current book, published by Harvard Education Press, is entitled *The Promise and Practice of Next Generation Assessment*.

He serves on numerous boards and advisory committees including as a member of the technical advisory committee of the Smarter Balanced Assessment Consortium (SBAC) and the Illinois State Board of Education Accountability Technical Advisory Committee, and as a founding board member of New Meridian, which now manages the PARCC assessments. Additionally, he chairs the New Meridian Steering Committee. Previously, he co-chaired the Validation Committee for the Common Core State Standards.

He has conducted multiple major research studies for the Association of American Universities, the College Board and its Advanced Placement program, the International Baccalaureate, and the National Assessment of Governing Board. He has most recently studied next generation systems of assessment, new indicators of college readiness, and new methods to determine career readiness.

Before entering higher education at the University of Oregon in 1989, Dr. Conley spent 20 years in the public-school system in a variety of roles including teacher and co-director of two alternative schools, a site and central-office administrator, and an executive in a state education agency. He is a first-generation college attendee who received his AA from Cabrillo College, his BA from the University of California, Berkeley, and his MA and PhD from the University of Colorado, Boulder. He grew up on the central coast of California, where he spent a great deal of time at the beach.

**Alana Dunagan**

Researcher, Higher Education, Clayton Christensen Institute



Alana leads the Institute's higher education research and works to find solutions for a more affordable system that better serves both students and employers. In this role, Alana analyzes disruptive forces changing the higher education landscape. Her research includes studying business model innovations, public policies, and investment strategies that can give rise to new and sustainable postsecondary models.

Prior to joining the Christensen Institute, Alana spent ten years in institutional investment management working on behalf of nonprofits, particularly colleges and universities. She worked as an investment consultant for Slocum, and spent five years with Macalester College managing their \$700 million

endowment. She holds a BA in Economics and Political Science from Macalester College and an MBA from the Harvard Business School.

**Devin Fidler**  
Founder, Rethinkery Labs



Devin has worked with senior leaders at dozens of Fortune 1000 companies to systematically explore emerging issues and technologies, and to analyze their potential impacts. His ongoing work at Rethinkery Labs, including developing tools for “self-driving” management, has been covered by HBR, the New York Times, Wired and a number of other publications. He argues that today, companies

themselves are a technology on the verge of disruption. Prior to founding Rethinkery, Devin founded and led the Future of Work and Future of Learning programs at the Palo Alto-based Institute for the Future.

Devin is a frequent speaker at gatherings of business leaders and others interested in the transformation of work and organizations. He approaches projects from a strongly international perspective, having lived and worked in several countries throughout his career.

## **Nancy Lue**

Co-Lead, Advanced Education Research & Development Fund



Nancy Poon Lue is currently co-leading the exploration of a national Advanced Education Research & Development Fund on behalf of the Chan Zuckerberg Initiative and the Bill & Melinda Gates Foundation. She is also a Partner and Secretary of the Board of Directors of the venture philanthropy organization Silicon Valley Social Venture Fund (SV2). Previously, she served as Executive Director at the venture capital firm Global Silicon Valley (GSV) and was the inaugural General Manager of the EdTech Lab at GSVlabs. During the Obama Administration, Nancy was a Senior Advisor at the U.S. Department of Education where she led the development of the agency's five-year strategic plan. Nancy is a Senior Fellow with the American Leadership Forum-Silicon Valley and sits on the Advisory

Board of the AT&T Aspire Accelerator and the GreenLight Fund-Bay Area. She earned her B.A. and Ed.M. from Harvard College and Harvard Graduate School of Education