Opening Letter from Bob

In 2016, I was approached by then-Provost Tan Eng Chye asking me to start a new chapter in my career. After ten years as the Vice Dean of Education at Duke-NUS Medical School, I joined NUS to serve as the founding director for ALSET, a new institute dedicated to improving how NUS students learn.

From the outset, ALSET was tasked with an important mission: to establish NUS as a leader in learning science and educational technology research, and to make sure that best practices were effectively applied in the classroom. This not only includes classrooms right here at NUS, but also across Asia and elsewhere in the world.

We started 2017 with a small team (3!), big dreams, and many unresolved questions about how we would approach this mission. By the end of the year, we established a vibrant Research Office, helped build a robust “Data Lake” holding NUS educational data, and started to attract a diverse community of leading researchers to join our institute.

We also launched an array of educational programs for students and working adults that will help them succeed in their studies and become effective lifelong learners. These programs would also serve as a way for us to experiment with new ways of teaching and measuring learning.

As I look back on work this year, I’m excited by our progress. Thanks to the ongoing support of the administration and the hard work of a dedicated and growing team, we now have laid the groundwork to make important advances in education. I’m even more excited by the prospects for our impact in 2018.

Best Wishes,

Professor Robert Kamei
Associate Provost (Education) at NUS and Director of ALSET
Introduction

The Institute for the Application of Learning Science and Educational Technology (ALSET) was founded in 2016 to support research and innovation in education at NUS. In 2017, we laid the foundation to produce world-class research and impactful programs for learners in Singapore and beyond. In our first-ever Annual Report, we lay out our accomplishments and plans for the years ahead.

WHAT WE DO

One of our biggest accomplishments for 2017 was aligning around a strategic vision that includes three main pillars of activity: research, innovation, and education.

ALSET’S THREE PILLARS

RESEARCH

We aim to become a leading hub for learning science and education technology researchers in Asia. We are particularly interested in investigating the behavioral and cultural attributes of Asian learners, but open to supporting any research that will contribute meaningfully to the field.

INNOVATION

We support the creation, evaluation, and application of innovative educational technologies and practices. We also help manage the NUS Data Lake, an exciting new resource for education researchers that compiles detailed data on student backgrounds, behaviors, and outcomes.

EDUCATION

We work in partnership with other NUS stakeholders to ensure that best practices are actually implemented in the classroom. We also provide courses, programs, and content directly to students and adult learners that help them apply best practices in their own lives.
Our strategic vision centers on original research and data to promote excellence in educational technology and pedagogical practice. We collaborate across a wide range of academic departments and disciplines in order to create one of the most interdisciplinary educational research institutes of its kind. Our ultimate focus is on students and adult learners. Our goal is to help them learn better.

Our research efforts will help ensure that pedagogical practice at NUS is aligned with the latest advances in learning science and educational technology. We will work collaboratively with the Centre for the Development of Teaching and Learning (CDTL), the Centre for Instructional Technology (CIT), and other departments at NUS to help them investigate new initiatives and stay on top of developments in their respective fields. We will also work with NUS Information Technology and CDTL to continue developing and managing the ALSET Educational Data Lake, an exciting new resource for education researchers that compiles detailed data on student backgrounds, behaviors, and outcomes.

Finally, we have worked to develop original courses and programs related to learning science and educational technology. For example, we recently ran a very successful pilot for Learning to Learn Better, an undergraduate course that examines recent research from the field and provides practical tips for being an effective learner. In 2018, we will work with the School of Continuing and Lifelong Learning (SCALE) to offer this class to a large group of working adults.

As we develop other courses, programs, and events, we look forward to deepening our ties and our engagements with the NUS community in 2018.

**ALSET ROLE IN THE NUS ECOSYSTEM**

- Education Researchers
- Academic Departments
- Centre for Instructional Technology (CIT)
- Centre for Development of Teaching & Learning (CDTL)
- NUS Undergraduates
- NUS Alumni
- Adult Learners
- School for Continuing and Lifelong Education (SCALE)
- NUS Enterprise
Senior Management

ALSET is led by a team of experienced educators, researchers, and technologists.

ROBERT KAMEI, M.D.
Director

Bob is the Associate Provost (Education) at NUS and the Director of ALSET. Prior to launching ALSET in 2016, he spent 10 years as the Vice Dean of Education at Duke-NUS Medical School, where he established an innovative pedagogical method called TeamLEAD, one of the first to incorporate the “flipped classroom” approach in medical education. He previously spent 17 years as the Director of Residency Training in Pediatrics at UCSF. He holds a B.S. in Human Biology from Stanford and an M.D. from the University of California, San Francisco.

CHRISTOPHER BOESH, PH.D.
Deputy Director

Chris is an Associate Professor (Education) and Deputy Director of ALSET. With over twenty years of experience in engineering and management roles at leading global technology firms, he oversees many of ALSET’s analytics and technology initiatives. Prior to joining ALSET, he spent 6 years as an Associate Professor of Information Systems at Singapore Management University, where he taught popular courses on cloud computing and big data. He holds a B.S. in Electrical Engineering from Auburn University and a Ph.D. in Computer Science from Nova Southeastern University.

MIN-YEN KAN, PH.D.
Deputy Director (Research)

Min is an Associate Professor at the School of Computing and Deputy Director (Research) at ALSET. An active member of the NUS community since 2002, he oversees the institute’s research initiatives in learning science and education technology. He also serves as the Assistant Dean of the Undergraduate Office at the School of Computing, and holds senior posts with many leading professional associations and entrepreneurship programs. He holds a B.S. and a Ph.D. in Computer Science from Columbia University.
Staff

ALSET also has a dedicated team with expertise in tracking grant opportunities, writing grant applications, providing research support, conducting statistical analyses of research results, and communicating the results of their work to a professional and a general audience.

WILL GREENE
Communications Officer

Will supports ALSET’s communications and digital marketing initiatives. He also writes regularly about science and technology trends in Asia for a variety of regional and international media publications. He holds a B.A. in Political Science from Amherst College.

STEPHANIE HEPNER
Research Coordinator

As research coordinator with ALSET, Stephanie supports ALSET’s research initiatives and policies. She connects researchers and instructors with similar research interests across the university, provides pedagogy and education literature background, supports researchers with IRB applications, and tracks relevant grant opportunities. She holds an M.S. in Education from St. John’s University, and a M.A. in Educational Leadership and Management from the University of Bath.

TECK KIANG TAN
Statistician

Teck Kiang is a statistician and research fellow at ALSET. Prior to joining ALSET, he was a research fellow at the Institute for Adult Learning. He is also the author of “Doubly Classified Models with R,” which was published by Springer in 2017. He holds an M.S. in Statistics from the National University of Singapore and a Ph.D. in Education from Nanyang Technological University.

MICHELE TEH
Management Assistant Officer

As a management assistant officer, Michele supports planning and operations at ALSET. She keeps the ALSET team on task and makes sure that everything works smoothly.

FAITH THIA
Communications Officer

A recent graduate in Political Science from NUS, Faith supports ALSET’s communications and digital marketing initiatives. She also helps run ALSET-sponsored programs and courses for students.
Advisory Board

Our efforts are guided by our Advisory Board, which include some of the world’s leading thinkers in learning science and educational technology.

LORI BRESLOW

Lori Breslow is a Senior Lecturer in Managerial Communication at the MIT Sloan School of Management. She was the founding director of MIT Teaching and Learning Laboratory (TLL) from 1997 to 2015, where she did some of the earliest research on MOOCs. Her research focuses on the development and impact of pedagogical, curricular, and technological innovations in higher education. Breslow has collaborated both in the U.S. and internationally on a number of initiatives to improve teaching and learning.

K. RANGA RAMA KRISHNAN

Chairman

Dr. Krishnan is currently the Dean of Rush Medical College in Chicago, Illinois. He was previously Professor of Psychiatry and Behavioral Sciences at Duke-NUS and Dean of Duke-NUS Medical School in Singapore. He was also co-chair of the Executive Committee of the Duke-NUS Singhealth Academic Medical Center partnership, and Chairman of the National Medical Research Council. He is widely regarded as a leading researcher on depression, bipolar disorder, and dementia.

TREVOR W. ROBBINS

Trevor Robbins is a Professor of Cognitive Neuroscience at the University of Cambridge, where he serves as the Chair of Experimental Psychology and Head of Department. He is also Director of the Behavioural and Clinical Neuroscience Institute (BCNI), jointly funded by the Medical Research Council and the Wellcome Trust. A decorated researcher, he has been included on a list of the 100 most cited neuroscientists by ISI, has published over 600 full papers in scientific journals and has co-edited seven books.

ANDREAS SCHLEICHER

Andreas Schleicher is Director for Education and Skills at the Organisation for Economic Co-operation and Development (OECD) in Paris, where he also serves as Special Advisor on Education Policy to the Secretary-General. His work includes the Programme for International Student Assessment (PISA), the OECD Survey of Adult Skills (PIAAC), and other key initiatives. Before joining the OECD, Mr. Schleicher was Director for Analysis at the International Association for Educational Achievement (IEA).
Joseph is an Assistant Professor at the School of Computing and ALSET’s Translational Research Technologies Lead. His research interests focus on creating intelligent, self-improving systems that conduct dynamic experiments to discover how to optimize and personalize technology. Prior to joining ALSET, he held research fellowships at Stanford and Harvard, where he built and deployed adaptive technologies for personalized learning. A native of Trinidad, he holds a B.S. from the University of Toronto and a Ph.D. in Computational Cognitive Science from UC Berkeley.

Patricia is an Assistant Professor in the Department of Psychology and a Research Theme Lead for Teaching and Learning Excellence. Her research focuses on understanding the mindsets and behaviors that promote goal achievement, and she designs psychological interventions that motivate people to pursue their goals strategically. A native of Singapore, she completed her Ph.D. in Social Psychology from the University of Michigan and conducted her postdoctoral research at Stanford University.

Jessica is an Associate Professor of Economics and a Research Theme Lead in Economics. She is an applied micro-economist with research interests in labor economics, the economics of education, gender, and immigration. Jessica earned a B.A. and Ph.D. in Economics and an MBA from the University of Chicago.

Tuan is an Assistant Professor at the School of Computing and a Research Theme Lead for Social and Networks Analysis. His research interests relate to online and offline social networks, social media, product diffusion, and web/mobile commerce. His work draws upon methods at the intersection of computer science, statistics, and the social sciences. A native of the United States, he earned a B.S. in Electrical Engineering and Computer Science at MIT and a Doctor of Business Administration in Marketing from Harvard University.

Joseph is an Assistant Professor at the School of Computing and ALSET’s Translational Research Technologies Lead. His research interests focus on creating intelligent, self-improving systems that conduct dynamic experiments to discover how to optimize and personalize technology. Prior to joining ALSET, he held research fellowships at Stanford and Harvard, where he built and deployed adaptive technologies for personalized learning. A native of Trinidad, he holds a B.S. from the University of Toronto and a Ph.D. in Computational Cognitive Science from UC Berkeley.
Research

In 2017, ALSET’s key accomplishments included:

- Established the ALSET Educational Data Lake
- Established a formal suite of policies and services for ALSET researchers
- Recruited an initial group of researchers to join the institute
- Hired two full-time staff to support our researchers
- Participated directly in multiple grant applications and IRBs
- Co-hosted our first research conference (WESST 2017)

THE ALSET EDUCATIONAL DATA LAKE

One of our biggest accomplishments in 2017 was establishing the ALSET Educational Data Lake, a powerful new resource for researchers and educational technologists. To achieve this, we worked with NUS Information Technology to create the IT architecture. We also worked with stakeholders from across NUS—including faculty, students, and the administration—to begin developing policies and a process for engaging the community on data ethics and management. The goal is to ensure that the data is used in an ethical and compliant manner, and that the security and privacy of student data is protected at all times.

In the past year, we also started populating the Data Lake with data from across the university. As shown in the box below, our ultimate ambition is to compile detailed data on educational backgrounds, behaviors, and outcomes—including long-term outcomes in the workforce.

THE NUS DATA LAKE—CURRENT AND FUTURE DATA SOURCES

Completed

- Registrar Data
- LMS Transaction Logs (IVLE)
- Graduate Employment Survey

Other Potential Data Sources

- Email Header Metadata
- Student Feedback
- Job Placement & Salary Data
- Co-curricular Activities
- Student housing
- Internship
ALSET’S GROWING RESEARCH COMMUNITY

As of December 2017, ALSET has officially recruited four research theme leaders, seven core faculty, and nine affiliated faculty. For the full list of ALSET staff and researchers, please see Appendix A.

ALSET’S FOUR LEVELS OF FACULTY APPOINTMENT

Research Theme Leaders are research-track faculty whose research interests are integrally aligned with ALSET’s goals. They are expected to be champions for learning science and education technology within their disciplines. They also expected to take part in committee work and run regular events. As such, they receive the highest level of service from ALSET, including privileged access to ALSET’s data warehouse and direct funding for their research.

Core Faculty are research-track faculty whose research interests are related to understanding and improving learners’ ability to learn and retain knowledge and skills. They also have access to a wide range of ALSET services, including the data warehouse and seed funding for their research, but fewer overall responsibilities than Research Theme Leads. ALSET aims to have 20-30 core faculty members across the university.

Affiliated Faculty are educator-track or research-track faculty who are interested in investigating pedagogical excellence. They can apply for access to the data warehouse and other research services on an as-needed basis. ALSET aims to have 50-100 affiliated faculty members across the university.

Allied Faculty are educator-track and research-track faculty who are interested in working with ALSET researchers to implement educational interventions in their courses.
THE WORKSHOP ON EDUCATIONAL AND SOCIAL SCIENCE TECHNOLOGIES

In July 2017, ALSET held the Workshop on Educational and Social Science Technologies (WESST 2017), a three-day conference that featured workshops and tutorials from some of the world’s leading voices in the field, including keynotes from Dragan Gašević of the University of Edinburgh, Xiangen Hu from the University of Memphis, and Carolyn Rosé and John Stamper from Carnegie Mellon University. Co-hosted with the School of Computing, it also included several staff and researchers from the Computer Science Department, as well as staff and researchers from across the broader education and social sciences community in Singapore.

Co-hosted by ALSET and the School of Computing at NUS, the WESST workshop brought together some of the world’s leading experts in educational and social science technology.

RESEARCH THEME LEADS

Assisting ALSET researchers are a growing array of provided services. This includes a dedicated team with expertise in tracking grant opportunities, providing research support, conducting statistical analyses of research results, and communicating the results of their work to a professional and a general audience. It also includes seed grants, events, and other services that help our researchers to develop and share their work.

For a full overview of the types of services we provide to each of these various faculty groups, please see Appendix B.
Innovation

Over the past year, we also made progress in our mission to drive innovation in learning science and education technology. The key accomplishments included:

- Developed a grant mechanism to promote innovation at the University, including seed grants to help NUS researchers secure larger grants from the MOE, NRF, and other funding bodies
- Hosted multiple innovation-oriented events, including the First EdTech Challenge, the Ultimate Learning Weekend, and Ace of Coders (a National Infocomm Competition)

Long term, we believe that NUS can be a global leader in learning science and education technology innovation. A big part of our mission is to help the NUS community fulfill its potential.

INNOVATION EVENTS: THE ULTIMATE LEARNING WEEKEND, THE EDTECH CHALLENGE, AND ACE OF CODERS

In 2017, we also hosted several events designed to encourage innovation and entrepreneurship in the local edtech community. In February, for example, we hosted the Ultimate Learning Weekend and the First EdTech Challenge, which included a business case competition for new edtech solutions.

Later in the year, we also helped run Ace of Coders 2017, a National Infocomm Competition that teaches students the fundamentals of coding. Co-hosted with the Info-communications Media Development Authority (IMDA) and held on the NUS campus, it included over 850 students from Singaporean secondary schools and junior colleges, as well undergraduates at NUS.

The event was led by deputy director Chris Boesch, who also played a key role in the Singapore National Coding Championships in April 2017 and other student coding competitions over the past three years.
**Education**

At ALSET, our ultimate goal is to ensure that the latest advances in learning science and education technology make it to the classroom. In this vein, our key accomplishments in 2017 included:

- Launched a pilot for our Learning to Learn Better (LTLB) course
- Laid plans to offer LTLB as a for-credit course for students and working adults in 2018
- Started preparing other courses, including Learning to Choose

We provide courses that bring the latest ideas from learning science and education technology directly to NUS students and adult learners in Singapore. We also actively support these efforts with research, events, and advocacy.

**ALSET COURSES**

In 2017, ALSET launched a pilot for Learning to Learn Better (LTLB), an undergraduate course that uses blended learning approaches to examine recent research and longstanding wisdom from the field of learning science.

Designed to provide students with knowledge and practical tips that will help them succeed in their studies, the pilot attracted over 30 students.

The pilot was a group effort that included multiple ALSET staff and faculty, including Fun Man Fung, an expert on the use of innovative videography techniques in education. The pilot helped us refine our content and approaches as we prepare to launch the pilot as a for-credit class at NUS and an adult learning seminar at the School of Continuing and Lifelong Education (SCALE) in 2018. It also helped us prepare to launch Learning to Choose, a second course that will cover the art of decision making.

Most importantly, the pilot delivered immediate impact for students. That is our ultimate goal, and the guiding light that will inform our activities in 2018.

Fun Man Fung is an IT-for-Teaching Chemistry Instructor with the Department of Chemistry and an enthusiastic contributor to ALSET’s education initiatives.
Appendix A: ALSET Staff and Researcher Directory

ALSET STAFF

- Robert Kamei
  Director
- Chris Boesch
  Deputy Director
- Min-Yen Kan
  Deputy Director (Research)
- Michele Teh
  Admin and Operations
- Teck Kiang Tan
  Statistician
- Stephanie Hepner
  Research Coordinator
- Faith Thia
  Communications Officer
- Will Greene
  Communications Officer
- Norrita Bte Abdul Ghani
  Business Consultant

ALSET RESEARCHERS

RESEARCH THEME LEADS:
- Patricia Chen
  (Psychology, FASS)
  Learning Science
- Tuan Q. Phan
  (DISA, Computing)
  Network Analysis and Social Outcomes
- Jessica Pan
  (Economics, FASS)
  Economics and Economic Outcomes
- Joseph Jay Williams
  (DISA, Computing)
  Translational Research Technologies

OUR CORE FACULTY AND THEIR INSTITUTIONAL/DEPARTMENTAL AFFILIATIONS ARE AS FOLLOWS:
- Bibhas Chakraborty
  (Duke-NUS)
- Fun Man Fung
  (Chemistry, FoS)
- Joshua Gooley
  (Neuroscience, Duke-NUS)
- Timothy Strauman
  (Psychology and Neuroscience, Duke)
- Greg Tucker-Kellogg
  (Biology, FoS)
- Wang Ye
  (Computer Science, SoC)

OUR AFFILIATED FACULTY AND THEIR INSTITUTIONAL/DEPARTMENTAL AFFILIATIONS ARE AS FOLLOWS:
- Chris Asplund
  (Psychology, Yale-NUS)
- Trevor Carlson
  (Computer Science, SoC)
- Michael Chee
  (Neuroscience, Duke-NUS)
- Paul O’Keefe
  (Psychology, Yale-NUS)
- Mihi Park
  (Language Studies, FASS)
- Lakshminarayanan Samavedhamlaksh
  (CheBE, FoE)
- Kelvin K.C. Seah
  (Economics, FASS)
- Min Kok Seet
  (Economics, FASS)
- Adelle Yang
  (Marketing, School of Business)
- Thomas Yeo
  (ECE, FoE)

OUR POST DOCTORAL FELLOWS:
- Adeetee Bhive
Appendix B: Summary of Benefits for ALSET Researchers

The table below provides an overview of the benefits and responsibilities for ALSET’s various faculty ranks.

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<th>Benefit</th>
<th>RESEARCH THEME LEADER</th>
<th>CORE FACULTY MEMBER</th>
<th>AFFILIATED FACULTY MEMBER</th>
<th>ALLIED FACULTY MEMBER</th>
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<td>Outreach and Core Research Funding*</td>
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<td>Educational Research</td>
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* Includes funding for post-doctoral researcher or equivalent (Approximately SGD $100,000) to support their research.

** Typically $10,000 - $20,000 and provided with the expectation that recipients apply for external funding within 12 months.

*** ALSET provides a grant calendar and matrix highlighting relevant external funding opportunities; this document is updated monthly by the research office.