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Dear Friends and Colleagues,

Hard to believe that it’s been only two years since we launched ALSET, and I’m once again amazed at how far we’ve come in such a short time. Time flies when you’re having fun!

From the outset, our mission at ALSET was to build a community of researchers and educators at NUS with a shared passion for educational research and innovation. This community now includes over 60 members from more than 15 unique disciplines, making us one of the most multidisciplinary groups of our kind. Ongoing research projects cover topics as varied as the impact of sleep on learning; how social networks make you smarter (or dumber); and the undergraduate behaviours that not only help students to land a job, but also to build a successful career and a meaningful life.

One major service we offer our researchers is the ALSET Educational Data Lake, a unique resource that now includes anonymised data on over 120,000 NUS students and alumni. We kicked off several projects this year that will yield even more data on how NUS undergraduates learn over their academic careers and perform in the workforce. Many of these projects are a long-term investment in data collection—while the real benefits may take years to materialise, we believe they will eventually establish NUS as a global hub for educational research. They will also allow us to measure the outcomes of key educational policies at NUS, such as the recent NUS Lifelong Learners Programme, an ambitious initiative that renders student enrolment at NUS as valid for 20 years from the point of admission.

We also launched two new courses for NUS undergraduates and alumni to cultivate essential skills in effective learning and decision making, as well as large-scale coding competitions that will help build Singapore’s technical talent base. These educational initiatives, which reached thousands of students this year, also serve as “living labs” for ALSET researchers to deploy and test educational interventions, further enhancing our understanding of how to optimise learning processes. Through local and international partnerships, we are now seeking to scale these programmes globally. We recently ran our first international course at L’institut Villebon Georges Charpak in France. Bonne nouvelle!

As always, I am grateful for the ongoing support of the NUS administration and the hard work of our staff, researchers, and board. Stay tuned as we announce even more exciting projects in 2019!

Best Wishes,

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

The Institute for Application of Learning Sciences and Educational Technology (ALSET) is a research institute at the National University of Singapore dedicated to helping learners to learn better. Founded in 2016, our mission is to be a leading hub for educational research and innovation in Asia. This report describes our recent progress and plans for the years ahead.

This past year was, in many ways, a pivotal year for ALSET. We tripled the size of our multidisciplinary research community; launched exciting studies to investigate learning policies and practices in Singapore and around the world; increased our headcount to offer new resources to our researchers; ran courses and competitions that reached thousands of Singaporeans; and inked partnerships with local and international organisations to extend our reach even further.

One significant change this year was the decision to implement a new organizational structure. We expect this new structure will give us greater clarity of purpose as we continue to expand in 2019.

ALSET’s Three Operating Units

DISCOVERY
The Discovery Research Unit conducts basic educational research and produces original data on how learners learn. It has researchers from a variety of fields, making it one of the most interdisciplinary research communities in the learning sciences.

TRANSLATION
The Translational Research Unit focuses on applied research on how learning actually happens in the classroom and the real world. It builds educational software tools, manages the ALSET Educational Data Lake, and runs events that drive inquiry learning for students.

EDUCATION
The Educational Unit provides courses and other services to help individuals of all ages become effective lifelong learners. These courses also serve as a lab for ALSET researchers to study learning and drive pedagogical innovation at NUS and beyond.
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Founding Director (ALSET)

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Deputy Director (Translational Research)

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Deputy Director (Discovery Research)

FUN MAN FUNG
Assistant Director (Education)

KEVIN HARTMAN
Translational Research Coordinator

ALEX BIOTTEAU
Discovery Research Coordinator

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Statistician

WILL GREENE
Senior Manager, Comms & Special Projects

MICHELE TEH
Assistant Manager

CALISTA ROCH
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ALSET EDUCATIONAL PROGRAMMES

ALSET’s ultimate mission is to help learners to learn better. In support of that mission, we offer courses and programmes directly to students and working adults that provide formal instruction in the fundamentals of how we learn, choose, and think. Our two flagship courses are Learning to Learn Better (LTLB) and Learning to Choose Better (LTCB).

Learning to Learn Better (LTLB)

LTLB examines recent research and longstanding wisdom from the learning sciences. The course helps students avoid common misconceptions about learning and develop evidence-based study practices. It demonstrates how best practices can sometimes be counterintuitive (a fact that students often don’t believe until they try incorporating these practices into their own lives).

LTLB was piloted in 2017 and offered on a for-credit basis for NUS undergraduates this year. It was also repackaged as a CET course for working adults and offered through the NUS School of Continuing and Lifelong Education (SCALE). Thanks to support from NUS Libraries, the course reached over 300 students and alumni in 2018.

If you want to find out more about LTLB, take a photo of this QR code and follow the link to watch the official trailer!
Learning to Choose Better (LTCB)

LTCB provides formal instruction on the fundamentals of critical thinking, decision making, and cognitive biases. The course was launched this year and attracted nearly 100 students for the first round of enrolment. It addresses natural biases and helps learners to avoid common traps through case studies that cover everyday scenarios, such as high-pressure sales tactics in stores or fake news stories in the popular media.

As blended learning experiences, LTLB and LTCB are highly scalable, and we are currently working to adopt these courses to other contexts. In 2018, for example, we partnered with the Institut Villebon Georges Charpark to launch LTLB in France.

ALSET courses not only provide meaningful learning experiences to students—they also serve as a living laboratory for our researchers to investigate learning behaviours and test pedagogical interventions. For example, Joshua Gooley is using wearable sleep sensors to conduct research on student sleep habits in the undergraduate LTLB course at NUS and in France. This cross-cultural study is supported by a collaborative grant between NUS and the Université Sorbonne Paris Cité.

In 2019, we also plan adopt our LTLB course at local high schools and polytechnics in Singapore, including the Anglo-Chinese School (Independent) and Singapore Polytechnic (SP). This will provide additional opportunities to recruit external collaborators and help ALSET researchers to perform similar studies in other student populations.
ALSET Coding Competitions

In addition to our flagship courses, we continued to organise and host large-scale coding competitions for Singaporean students. This includes two main events—the National Coding Competition in May and Ace of Coders in November—that both drew over 1,000 participants from Singapore’s secondary schools, junior colleges, and polytechnics.

As with LTLB and LTCB, we also use these events as labs for conducting educational research. In August, for example, we hosted CODE:2018!, an event for aspiring female coders that drew over 70 high school students. The event helped us investigate gender preferences regarding STEM activities and generated insights that we hope will help increase female participation in technical disciplines.
ALSET RESEARCH INFRASTRUCTURE

ALSET offers an array of datasets, tools, and services that support our faculty and partners in their educational research initiatives. One of our most important services is management of the ALSET Educational Data Lake, an information repository that aggregates data from across the university and beyond.

Launched in 2016, we made many improvements this year, including expansion of existing datasets (notably archived data from 2014-2016) and addition of new datasets, which collectively cover learning behaviours and outcomes for over 120,000 students and alumni.

The Data Lake provides unique opportunities for researchers and policymakers to follow the education of a large group of Singaporeans for their entire careers. Insights from our datasets will be critical to measure Singapore’s educational quality and future needs. We are positioning ourselves to have a multidisciplinary and longitudinal perspective.

ALSET also offers a range of support services for researchers. For our Core Faculty, this includes assistance with grant writing, IRB submissions, participant recruitment for research studies. It also includes statistical support services from Teck Kiang Tan, ALSET’s resident statistician.

ALSET is recruiting researchers to join as either core or affiliated faculty (see Appendix A for further details about the benefits and expectations for ALSET researchers). For more information, contact our Discovery Research Coordinator Alex Biotteau: alsab@nus.edu.sg
ALSET RESEARCH PROGRAMMES

ALSET’s research activities fall under our two dedicated research units— the Discovery Research Unit, which conducts basic educational research and collects original data related to the science of learning, and the Translational Research Unit, which focuses on applied research about how learning happens in the classroom and in the real world.

ALSET Discovery Research
The Discovery Research Unit grew rapidly this year. After starting the year with less than 20 researchers in our community, we now have faculty from over 15 unique disciplines, making us one of the most interdisciplinary research institutes of our kind. Our research is organised around four main themes, each headed by an accomplished Research Theme Leader who serves as a champion for learning science and educational technology within their discipline.

Discovery Research Themes and Leads

Social Networks and Learning Analytics
The impact of social relationships, connections, and networks on academic outcomes and employment.

Psychology of Learning
The cognitive, affective, behavioral, and social mechanisms of learning and teaching.

Economic Impact of Education
The effect of academic programs and policies on educational and labor market outcomes.

Neuroscience of Learning
The development and application of neuroscience-inspired approaches for improving learning.

Patricia Chen
Tuan Q Phan
Jessica Pan
Joshua Gooley
The **Economic Impact of Education Theme**, led by Jessica Pan, launched several studies investigating how student behaviours and university policies can impact labour market outcomes of NUS graduates. This includes research on the impact of the discretionary admissions policy that NUS launched in 2004, as well as the relationship between earnings and undergraduate grades, fields of study, course taking diversity, and other factors.

The **Neuroscience of Learning Theme**, led by Joshua Gooley, focuses on building teams that leverage cognitive-neuroscience approaches in educational research. This includes exploring the possibility of using sleep data for identifying at-risk students and developing interventions that can improve mental health and academic performance.

The **Economic Impact of Education Theme**, led by Jessica Pan, launched several studies investigating how student behaviours and university policies can impact labour market outcomes of NUS graduates. This includes research on the impact of the discretionary admissions policy that NUS launched in 2004, as well as the relationship between earnings and undergraduate grades, fields of study, course taking diversity, and other factors.

The **Social Networks and Learning Analytics Theme**, led by Tuan Q. Phan, began research on the role of peer influence on academic and workforce outcomes of NUS students. Phan is also designing analytic techniques to test socio-motivational elements in student learning, identify students at risk of mental health issues, understand how information propagates through online and offline social networks, and serve other educational goals.

The **Psychology of Learning Theme**, led by Patricia Chen, supported ALSET researchers in their research projects related to language learning, exercise, and the relationship between undergraduate field-of-study and employment outcomes. Chen also received a $3m National Research Foundation Fellowship and a $450,000 grant from the Singapore Millennium Foundation in 2018 to create psychological interventions aimed at cultivating self-directed learning.

ALSET also supported several interdisciplinary research and data collection projects, including the Freshman Survey, a longitudinal study that aims to understand how NUS undergraduates study and learn over their academic career. We are also working on a grant proposal to improve upon the NUS Graduate Employment Survey and collect more longitudinal data on workforce outcomes for NUS students.
Translational Research

Beyond basic educational research, ALSET aims to ensure that key findings from the learning sciences get translated and evaluated in the classroom and real-world settings. Our Translational Research Unit conducted an array of activities this year, all geared towards generating real-time insights and enabling “just-in-time” interventions to improve learning outcomes.

ALSET offers a growing library of educational software tools that support this kind of research. This includes an open-source platform called Achievements that allows instructors and students to better create, manage, and track various learning activities, as well as a variety of individual software tools called “Embeddables” that collect data from learning management systems or web-based learning platforms such as our NUS LumiNUS.

To leverage these tools and datasets, we recently set up a Translational Research Interest Group (TRIG) that brings together experienced NUS educators with an interest in understanding how data can enhance learning in the classroom. It is headed by Laksh Samavedham, the former director of the Centre for Development of Teaching and Learning at NUS and a longstanding advocate of the use of data in education.

ALSET is also conducting translational research on working adults through a recent partnership with SkillsFuture Singapore to develop a course recommender system for the SkillsFuture Credit scheme. Following an initial test on a cohort of NUS alumni between the ages of 22-29, we endeavour to apply this to other contexts, such as making course recommendations to NUS students.
CONCLUSION

Through all these efforts, ALSET aims to be a global leader in learning sciences and education technology research, as well as a provider of impactful technologies and programming for educators and learners in Singapore and around the world.

Being based at NUS, we endeavour to collaborate with the university’s rich community of education professionals and specialist centres to make this happen. Our unique focus on basic and translational research in the learning sciences allows us to develop insights and best practices that benefit the entire NUS ecosystem.

Beyond NUS, we are increasingly forging partnerships with external stakeholders from Singapore and beyond. This includes our longstanding work the Info-communications Media Development Authority to run national coding competitions for Singaporean students; our recent partnership with SkillsFuture Singapore to study course selection behaviours among working adults; and a July partnership with the Centre for Research and Interdisciplinarity (CRI-Paris) in France to support joint research efforts.

ALSET’s Role in the NUS Ecosystem

- NUS Undergraduates
- NUS Alumni
- Adult Learners and Working Professionals
- School for Continuing and Lifelong Education (SCALE)
- NUS Enterprise

RESEARCH & DATA

- Education Researchers
- Academic Departments
- Centre for Instructional Technology (CIT)
- Centre for Development of Teaching & Learning (CDTL)
- Centre for Future Ready Graduates (CFG)
- Centre for English Language Communication (CELC)
Much of our work dovetails with the broader shift taking place at NUS, where university leaders recently declared that student enrolment is now valid for 20 years from the point of admission, an initiative known as the NUS Lifelong Learners Programme (L³). It also aligns with the policy recommendations of Singapore’s Committee on the Future Economy in February 2017, which highlighted workforce development as a critical priority area for the government and supported renewed efforts for continuous learning, reskilling, and job placement.

Our work is increasingly gaining recognition from local, regional, and international bodies. At the Reimagine Education Conference in San Francisco, for example, ALSET faculty took home several awards for our innovative approaches to pedagogy and educational technology. Our faculty and staff routinely present at conferences around the world to share case studies and build further partnerships. We often find that our peers are fascinated and inspired by the work happening at ALSET and in the broader NUS community.

Through our research, programming, and partnerships, our ultimate goal is to drive better understanding of educational practices and policies in Asia, and to establish NUS as a leading hub for learning science and educational technology in the region. We invite you to join us as we continue to make exciting progress on that mission.
## APPENDIX A:
### BENEFITS AND DUTIES OF ALSET MEMBERSHIP

<table>
<thead>
<tr>
<th>Benefits and Duties</th>
<th>Affiliated Faculty</th>
<th>Core Faculty</th>
<th>Research Theme Leader</th>
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</thead>
<tbody>
<tr>
<td><strong>Funding</strong></td>
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<tr>
<td>Seed Funding</td>
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<td>●</td>
<td>●</td>
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<tr>
<td>Education Conference</td>
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<tr>
<td>Outreach &amp; Research</td>
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<tr>
<td><strong>Data</strong></td>
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<td>Access to Data Lake</td>
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<tr>
<td>Support from Statistician</td>
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<td>●</td>
<td></td>
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<tr>
<td><strong>Research Support</strong></td>
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<tr>
<td>Grant Application Support</td>
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<td>●</td>
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<tr>
<td>IRB Support</td>
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<td></td>
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<tr>
<td>Matching Grant Funding</td>
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<tr>
<td>Participant Recruitment</td>
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<tr>
<td><strong>Partnerships</strong></td>
<td></td>
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</tr>
<tr>
<td>Matchmaking</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Featured on ALSET Website</td>
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<td>●</td>
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<tr>
<td><strong>Duties</strong></td>
<td></td>
<td></td>
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<tr>
<td>Contribute to ALSET Project</td>
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<td>Encouraged to Contribute</td>
<td>Lead Strategic Development</td>
</tr>
<tr>
<td>Research Seminar</td>
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<td>Encouraged to Attend</td>
<td>Organise</td>
</tr>
<tr>
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<td></td>
<td>Footnote Where Applicable</td>
<td>ALSET Affiliation</td>
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<tr>
<td>Governance Meeting</td>
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<td>Expected to Attend</td>
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</tbody>
</table>

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Institute for Application of Learning Science and Educational Technology
Annual Report 2018
APPENDIX B: OUR RESEARCHERS

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