



## **JOINT NEWS RELEASE**

**Singapore, 1 September 2022**

### **NTU Singapore and A\*STAR to reshape tomorrow's classrooms through technology-inspired education research**

**Nanyang Technological University, Singapore (NTU Singapore) and the Agency for Science, Technology and Research (A\*STAR)** are collaborating on joint research projects in education that aim to translate research into pedagogy design and intelligent tools for the classroom of the future.

Leading NTU's efforts in this partnership are its **National Institute of Education (NIE)** and **School of Computer Science and Engineering (SCSE)**.

The Memorandum of Understanding was signed today at a ceremony at NIE.

The collaboration brings together researchers and academics from NTU and A\*STAR to work on education research through projects focusing on the science of learning in education, AI, machine learning and human-artificial cognition, with the aim to help students learn and educators teach more effectively.

For example, researchers will reimagine a classroom where human instructors and AI interact to engage students better and explore how knowledge and skills can be imparted to students more effectively through the use of technology.

Researchers aim to collaborate and develop capabilities in interdisciplinary research projects and testbeds in the areas of science of learning in education and human health and potential.

Building on NIE NTU's vision to develop and grow hubs of excellence in early childhood, pedagogy, and practice, the collaboration aims to create educational practices and strategies for tomorrow's classrooms that can contribute to teaching and learning across an individual's entire lifetime.

NTU's SCSE will support the effort with its interdisciplinary research excellence in education technology and AI, which includes areas such as teacher-machine

augmented intelligence, and interactive and personalised learning systems.

The collaboration will also see the streamlining of joint research grant submissions and allow for deeper cross-institutional connections.

**Professor Louis Phee, NTU Vice President (Innovation & Entrepreneurship) and Dean, College of Engineering**, said: “The collaboration between A\*STAR and NTU, spearheaded by the university’s NIE and SCSE, will further strengthen and facilitate the interdisciplinary research collaboration among the partners, and bring talented people from different disciplines and organisations together to solve impactful and authentic problems of practice in education.”

**Professor Christine Goh, President’s Chair in Education (Linguistics & Language Education) and Director of NIE**, said: “Building on NIE’s vision of Leading the Future of Education, the partnership will boost research in science of learning and the use of technologies such as AI for education, contributing to envisioning the classroom of the future.”

The partnership leverages A\*STAR’s research expertise in AI, data analytics as well as the integration of social and behavioural science with technology to solve problems of practice for the future of education.

**Professor Lim Keng Hui, Assistant Chief Executive, Science & Engineering Research Council, A\*STAR**, said: “We are looking more closely at innovative ways to help students learn, and to help educators teach. Integrating AI technologies with the social and behavioural sciences allows us to jointly tackle challenges in existing teaching and learning systems. A\*STAR looks forward to a deeper partnership with NIE and NTU, where we can leverage one another’s multidisciplinary capabilities to come up with real-world solutions that result in better educational outcomes for learners at multiple levels.”

Both NTU and A\*STAR will exchange data, share laboratory resources, and enable researchers and graduate students to exchange knowledge through short-term attachments in research labs and schools.

Examples of ongoing collaborations include projects which focus on using AI in an experimental classroom, improving student engagement in virtual learning environments, and EVA (Education via AI), an adaptive learning buddy for students. More information about these projects can be found in [Annex A](#).

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***About Nanyang Technological University, Singapore***

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Medicine, Humanities, Arts, & Social Sciences, and Graduate colleges.

NTU is also home to world-renowned autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

Ranked amongst the world's top universities, the University's main campus is also frequently listed among the world's most beautiful. Known for its sustainability, over 95% of its building projects are certified Green Mark Platinum. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

For more information, visit [www.ntu.edu.sg](http://www.ntu.edu.sg)

### ***About the National Institute of Education (NIE), Singapore***

The National Institute of Education (NIE), an autonomous institute of the Nanyang Technological University (NTU), Singapore is among the world's top education institutes, renowned for its excellence in teacher education and education research. Founded in 1950, NIE has played a pivotal role in developing Singapore's teaching workforce.

In a dynamic education milieu, NIE prepares teachers with the requisite values, skills and knowledge to meet the continuous demands of diverse learners across the lifespan. The quality of NIE programmes is based on evidence-informed reviews and enhancement, and delivered using innovative pedagogies in digitally-mediated learning spaces. NIE's degree, higher degree and professional development programmes offer global perspectives through international practice and semester exchanges, while 21<sup>st</sup> Century pedagogies, multidisciplinary curricula and service-learning initiatives help to develop the holistic reflective practitioner and school leader. The Institute also offers the only local sports-related undergraduate degree programme in Sport Science & Management that provides academic and professional pathways to sports-related careers.

NIE is ranked among the world's top institutions for research in education and the education-related disciplines. Its research philosophy is focused on impacting school practices, enhancing programmes, informing policy formation and, ultimately, improving student learning outcomes. With its highly reputable education programmes and rich research culture, it has built strategic alliances with many other renowned institutions in the US, Europe and Asia Pacific regions.

Recognising the need to anticipate, adapt and advance, NIE has recently identified five strategic growth areas under a new institute-level initiative, Learning Initiatives for the Future of Education at NIE NTU Singapore (LIFE@NIE SG<sup>®</sup>). Over the coming years, NIE will grow its regional and global impact in these five priority areas – Child and Human Development, Values and Ethics, Science of Learning, Emerging Technologies, and Assessment and Evaluation – to lead the future of education and play its part in helping to address Singapore and humanity's grand challenges in an ever-evolving world.

For more information, please visit: [www.nie.edu.sg](http://www.nie.edu.sg).

### ***About Agency for Science, Technology and Research (A\*STAR)***

The Agency for Science, Technology and Research (A\*STAR) is Singapore's lead public sector R&D agency. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit the economy and society. As a Science and Technology Organisation, A\*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by improving societal outcomes in healthcare, urban living, and

sustainability. A\*STAR plays a key role in nurturing scientific talent and leaders for the wider research community and industry. A\*STAR's R&D activities span biomedical sciences to physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit [www.a-star.edu.sg](http://www.a-star.edu.sg).

## **ANNEX A**

### **JOINT PROJECTS**

<b>Ongoing Projects and Descriptions</b>	<b>Principal Investigator and Collaborators</b>
<p data-bbox="204 443 810 640"><b>Development of AI-based performance/competence and behavioural measures for teaching and classroom management (AI for experimental classroom)</b></p> <p data-bbox="204 674 783 909">The project aims to develop a proof-of-concept training tool for teacher development, and will explore the use of audio-visual sensors with AI inference to uncover and understand meaningful classroom behaviours.</p> <p data-bbox="204 947 826 1227">A prototype system will be built to automatically and quantitatively assess teachers' classroom management skills. This can help to inform and accelerate their professional development, as traditionally teachers acquire teaching and classroom management skills through experience.</p> <p data-bbox="204 1265 815 1458">An audio-visual dataset unique to the local educational context will also be collected and made available for use in future research into such technologies in the classroom.</p>	<p data-bbox="871 443 1070 472">Collaborators:</p> <ul data-bbox="871 524 1369 640" style="list-style-type: none"><li data-bbox="871 524 1369 562">• A*STAR (Principal Investigator)</li><li data-bbox="871 562 1369 640">• National Institute of Education (NIE), Singapore</li></ul>
<p data-bbox="204 1563 831 1637"><b>Improving student engagement in virtual learning environments</b></p> <p data-bbox="204 1675 842 1868">With the rise of virtual classroom teaching, the project aims to study the effectiveness of using engagement detection tools to help teachers in estimating the engagement levels of students in virtual classrooms.</p> <p data-bbox="204 1906 730 1977">The goal is to develop an AI tool that provides educators with feedback on</p>	<p data-bbox="871 1563 1070 1592">Collaborators:</p> <ul data-bbox="871 1644 1369 1760" style="list-style-type: none"><li data-bbox="871 1644 1369 1682">• A*STAR (Principal Investigator)</li><li data-bbox="871 1682 1369 1760">• National Institute of Education (NIE), Singapore</li></ul>

<p>student engagement in various virtual learning environments.</p> <p>An audio-visual dataset of educators and students in virtual learning environments would be collected. This would allow for the study of student engagement levels over time, as well as the analysis of factors affecting student engagement in virtual learning environments.</p> <p>The development of this tool can enable a study on the effectiveness of various teaching methods in virtual learning environments in the future.</p>	
<p><b>EVA (Education via AI): Your adaptive learning buddy</b></p> <p>This project looks to develop a conversational AI engine that is powered by algorithms in neural language generation, representation learning, and dialogue modeling. This will be a virtual tutor system that helps students acquire and practice reading aloud skills in English.</p>	<p>Collaborators:</p> <ul style="list-style-type: none"> <li>• A*STAR (Principal Investigator)</li> <li>• National Institute of Education (NIE), Singapore</li> </ul>

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