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research in education at the National Institute of Education, Singapore

# teacher development along a continuum

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# Editorial



Prof Low Ee Ling  
Head, Office of Strategic Planning  
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National Institute of Education

Internationally, it has been established that teacher learning begins even before teachers enter their pre-service programme. As such, teacher professional development includes previous experiences in school as well as an individual's life experiences, and this continues to develop during the pre- and in-service years.

During the pre-service years, education research is introduced to student-teachers to allow them to better bridge the theory-practice nexus and to allow them to develop inquiring mind-sets. This is dependent on the type of pre-service programmes, the nature of the programme and importantly, clinical field experience (also known as a practicum), early field experiences or the compulsory school stint depending on different contexts of practice. These collective experiences at pre-service will continue to help teachers develop their learning in terms of professional competencies and identities as they begin their journeys as beginning teachers.

During the in-service years and depending on the culture of the school, some teachers might be more exposed to education or action research compared to other teachers. Much research conducted at the National Institute of Education, Singapore involves

the participation of schools, school leaders and the teachers, and these research studies seek to provide in-service teachers with continuous professional development in various areas as well as to inform professional development needs.

This issue of *ReEd* will showcase projects covering the span of teacher professional learning from pre-service and beyond the beginning teacher years. Beginning teachers are teachers who are 2 to 3 years into the teaching service. However, in reality, teaching professional development continues throughout the lifespan of a teacher's career; it begins the minute a teacher enters into service and continues throughout his or her professional life as a teacher.

The collective research studies showcased in this issue aim to exactly detail this lifelong teacher learning journey. ■

## EDITORIAL TEAM

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**ReEd** (*Research in Education*) is a research bulletin aimed at sharing our research contributions with the global community. This is an initiative of the Office of Education Research at the National Institute of Education (NIE), Singapore.

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# Re Teachers as Mentors

## PROJECT TEAM

**Principal Investigator** Low Ee Ling, *National Institute of Education, Singapore*

**Co-Principal Investigators** Liu Woon Chia, Ng Pak Tee, *National Institute of Education, Singapore*; A. Lin Goodwin, *Teachers College, Columbia University, USA*; Goh Sao-Ee, *Academy of Singapore Teachers, Singapore*

**Collaborators** Chua-Lim Yen Ching, Sarifah Noor Aini Bte Syed Mahmood, *Academy of Singapore Teachers, Singapore*; Alexander See Shing Yeung, *Australian Catholic University, Australia*

**Research Associate/Assistant** Cai Li, Cheong Beng Cheong, *National Institute of Education, Singapore*

**PROVIDING STUDENTS** with a meaningful learning experience in school is every educator's goal. Before they can do so, teachers must first be professionally ready and well-equipped to bring their learners on this enriching learning journey.

To enhance the professional expertise of beginning teachers and their effectiveness for students' learning, the Academy of Singapore Teachers (AST) introduced a mentoring programme specially tailored for them as they embark on their teaching careers.

### Professional Learning for Beginning Teachers

"There is a very big difference when beginning teachers move from initial teacher education (pre-service) into schools (in-service)," Executive Director of AST and Deputy Director-General of Education (Professional Development) at Ministry of Education Mrs Chua Yen Ching says. "It is because of this that we have structured mentoring for our beginning teachers to ensure a smooth transition from the pre-service to in-service level."

Beginning teachers, defined as teachers who are in their first 2 years of teaching, participate in an instruction-focused programme conducted by their teacher-colleagues who assume the role of mentors in schools.

There are oftentimes gaps between expectations and reality, and some of the teaching practices beginning teachers learn during their pre-service preparation may not always work or be applicable in the classroom. The mentoring programme provides them with the necessary skills required to adjust their classroom practices accordingly on the ground.

**Preparing Quality Teacher-Mentors** For the mentoring programme to be effective, it is imperative to first equip the selected teacher-mentors with the necessary skills through an instructional mentoring programme (IMP) for them at AST.

"The aim of IMP is to prepare them as mentors to our beginning teachers," shares NIE Professor Low Ee Ling, who has been working closely with AST for the past 4 years. "These teacher-mentors are carefully selected and they need to have a certain number of years of teaching experience."



*Prof Low (centre) and her team believe that it is important to equip teachers with the skills needed to be effective mentors to other beginning teachers in schools.*

As this mentoring programme has been implemented for 2 years since 2015, Prof Low feels that it is now the perfect time to measure and evaluate the effectiveness of the programme through her latest research project.

**Measuring the Success of Mentoring** "The core purpose of my latest project is to investigate the factors that contribute to successful implementation of mentoring beginning teachers based on the IMP," Prof Low explains.

In this case, successful implementation should be viewed as positive impact on beginning teachers and their instructional practices. This includes the way a teacher engages his or her students actively in the classroom.

"Teachers' pedagogical approaches form the core of their instruction as they work to achieve specific learning objectives," she adds. These approaches also determine the effectiveness of student learning.

While Prof Low believes that it is important to understand how the mentoring programme impacts teachers positively, she ultimately feels that our young learners are at the heart of the education system. "We are very clear that whatever we research on, it cannot be just for the sake of research. It must contribute to our education system and especially to enhance the learning experience for the learners in our classroom." ■

# Developing Music Educators through Videos **Re**

## PROJECT TEAM

**Principal Investigator** Alfredo Bautista, *National Institute of Education, Singapore*  
**Co-Principal Investigators** Tan-Chua Siew Ling, *Singapore Teachers' Academy for the aRts, Singapore*;  
Eugene Dairianathan, Zachary Walker, *National Institute of Education, Singapore*  
**Collaborators** Ho Hui Ping, *Singapore Teachers' Academy for the aRts, Singapore*; Sandra Yuen, Denny  
Aw Yong, *Ministry of Education, Singapore*; Simon Lui, *Singapore University of Technology and Design,*  
*Singapore*; Francis Dubé, *Faculté de Musique, Canada*; Cristina Marín, *University of Music and*  
*Dramatic Arts Graz, Austria*  
**Research Assistants** Clarence Tan, Joanne Wong, *National Institute of Education, Singapore*

**MUSIC, ARTS** and physical education—these are subjects that many might think of as unimportant. For music educators in most countries, they do not get sufficient access to resources to reinforce their teaching practices.

In Singapore, however, that is not the case.

**Back to Basics for Teachers** An NIE research team, in collaboration with the Singapore Teachers' Academy for the aRts (STAR) and Arts Education Branch, has been looking into enhancing professional development resources available to primary and secondary school music teachers to enhance students' music learning.

Music teachers in secondary schools typically have a specialized music degree and they understand the subject well. However, this is not always the case in primary schools.

Even though the number of primary music specialists is increasing, there are still many generalist music teachers who feel quite ill prepared to teach this subject. "So it is important to reach out to these teachers," explains Principal Investigator Alfredo Bautista.

He does so through a collection of videos.

**Observing the Best** Since its establishment in 2011, STAR has orchestrated the collection of more than 800 video recordings on aspects related to teaching and learning of music.

These videos include lessons conducted in real classrooms, master teachers demonstrating innovative activities, and music pedagogy workshops that non-specialist music teachers can use to implement in their own lessons.

"Music teachers in the same school generally do not see how teachers from other schools

conduct their lessons," says Alfredo. "So we want to emphasize the value of observation, the value of being exposed to good classroom practices, and the value of observing how another music teacher is implementing a fantastic lesson."

**A Different Approach** The use of video technology to enhance the learning of music teachers is still an emerging idea in the field of music education.

"In many areas, this video idea has been out there for a while especially for mathematics and science education," explains Alfredo. "In music, however, this is something that is not so popular yet."

Providing music teachers with the opportunity to observe different music lessons helps broaden their classroom practices too. "They get to see different points of views and the process of analysing these practices is very productive," he adds.

Moving forward, Alfredo also plans to explore ways to design an online platform in which music teachers can have access to. "It could be a website where music teachers can log-in and watch these videos and interact with other music teachers." ■



*Alfredo (centre), and his Research Assistants Clarence and Joanne are interested in using video technology to further enhance the learning of music for primary and secondary school teachers.*



# In Pursuit of Continuous Teacher Development

## PROJECT TEAM

**Principal Investigator** Rita Elaine Silver, *National Institute of Education, Singapore*

**Co-Principal Investigator** Jessie Png, *National Institute of Education, Singapore*

**COLLABORATIONS BETWEEN** researchers and schools are commonplace today. They identify existing or potential educational issues in the school and work on designing classroom interventions to address them.

But what happens to an intervention after a project is over and the researchers leave?

“We knew from our previous projects that when we researchers leave after the project is over, the interventions tend to vanish too because there is no one in the school who has the expertise to sustain and support them,” explains NIE Associate Professor Rita Elaine Silver from the English Language and Literature (ELL) Academic Group.

This inspired Rita to equip collaborating teachers with the necessary knowledge and skills to sustain a particular intervention.

**Open-ended Questions** Rita embarked on a project with NIE colleague Jessie Png (Senior Lecturer in ELL and Assistant Dean of Office of Teacher Education) that introduces a strategy of using “queries” and “follow-up moves” to teach reading comprehension at the primary school level.

Typically, teachers are quick to correct pupils upon provision of an incorrect answer, but pupils might not always understand the underlying reason for their mistakes. By instead asking questions like “Why do you think so?” teachers can hear student reasoning and tackle the root of misunderstandings.

“When introduced to this method, teachers were initially worried about the unpredictable responses their queries might elicit,” says Rita. “But once they got started, they realized they could do it.”

**Learning through Practice** For any new strategy to be acquired effectively, practice and reflection are crucial. Ideally, teachers should spend 3 to 5 years practising, reflecting and adapting the strategy to suit student needs.

Rita and Jessie worked closely with the school’s Professional Learning Community, encouraging teachers to share their own experiences with fellow teachers.

“It was amazing how once fearful teachers became so confident and lively during lessons,”



*Rita (left) and Jessie want to help build up the level of confidence in teachers so they can sustain an intervention beyond the completion of a project.*

says Jessie. “The teachers have actually developed.”

One teacher even commented that she was able to tell that her students understood the comprehension text based solely on their open-ended responses, and concluded this method shortened the time taken to gauge their level of understanding.

**Spreading Knowledge Confidently** Such teacher buy-in is what Rita and Jessie hope to see more of. Eventually, they hope more teachers will gain the confidence to share their knowledge with their peers.

“The idea is to have these ‘First Generation’ teachers become mentors to the next batch of teachers,” explains Rita. “Developing the confidence to teach somebody else to use the strategy is a whole different part of professional development.”

At first, many teachers felt unqualified to mentor their colleagues, but they became more willing when they saw how the strategy benefitted their students and expanded their teaching.

“We stayed with these teachers until they became not only confident in the strategy but also in their ability to teach their fellow teachers,” shares Rita.

And just as they hoped, teachers have picked up the baton of knowledge sharing, ensuring the intervention continues beyond the conclusion of the project. ■

# Teacher Learning for the Spread of Innovation **Re**

## PROJECT TEAM

**Principal Investigator** Lee Shu Shing, *National Institute of Education, Singapore*

**Co-Principal Investigators** Toh Yancy, Dennis Kwek, *National Institute of Education, Singapore*

**Collaborators** Kenneth Lim, Wu Longkai, Wong Lung Hsiang, *National Institute of Education, Singapore*

**WHEN RESEARCHER-INITIATED** innovations are implemented in schools, there is a tendency to focus on the immediate results at the expense of longer-term considerations, observes NIE Research Scientist Lee Shu Shing.

However, as such innovations become more commonplace, there is a need to look beyond the efficacy of one-off interventions and consider their sustainability and spread. For this to happen, Shu Shing believes a change in mindset is needed—in particular, a shift from a results-oriented approach to a focus on teacher learning that occurs during interventions.

**Prioritizing Teacher Learning** “Classroom innovation is just the first step to get teachers thinking about their practice,” explains Shu Shing. “Only when we know how teachers learn and how embarking on certain changes can help them to reflect on their pedagogy, can we consider ways to foster the spread of these innovations.”

Her research project thus returns to some existing classroom interventions that have matured over 3 to 5 years to investigate how teachers learn as they enact them, and the structures and processes required to support this learning.

**Understanding the School Context** Because innovations change over time from school to school depending on the needs and readiness of the teachers, much of Shu Shing’s work involves going to schools to understand the unique contexts and processes where teacher learning occurs.



*Shu Shing is exploring teacher learning that occurs when they embark on new pedagogical practices.*

Leveraging the connections of researchers who have implemented innovations in particular schools, she observes teacher-researcher interactions and builds rapport with teachers to gain a better understanding of their learning process.

“We also look at how innovations have grown in schools to understand the structures and processes that are put in place to grow them,” shares Shu Shing.

As innovations mature and teacher capacity develops, teachers take ownership and work as a team to make sense and integrate the innovation into school-based practices or curriculum.

When a researcher works closely with a teacher, he or she is able to value-add teacher learning by identifying challenges teachers may face along the way and addressing issues as they arise.

While the process may be slower and more resource-intensive than sending teachers for one-time professional development workshops, it ultimately brings about deeper learning.

**Building Self-sustaining Innovations** “School leaders need to have the vision and willingness to put aside resources to allow teachers to pursue deeper learning,” says Shu Shing. “One of the schools we work with has started by freeing up time for teachers to do this.”

As an innovation spreads, there is a need to ensure its sustainability by moving beyond the school to build communities where teachers can learn from each other, turning them into “expert teachers” who can demonstrate classroom innovations to their peers.

“The community is very important,” explains Shu Shing. “When there is a community, everyone learns together, and everyone contributes as experts in different subject areas.”

Eventually, how well one can engage the wider community—other schools as well as system-level structures like the Academy of Singapore Teachers—for teacher learning will determine the sustainability and spread of these innovations. ■

# Ed Research in Action

## S5 Cluster's Professional Development for Teachers in Action Research



**FOLLOWING THE** S5 Cluster's request for teachers' professional and research development, a research team from the Office of Education Research (OER) led teachers from St Andrew's Junior School (SAJS), Anglo-Chinese School (Junior) (ACS Junior) and St Joseph's Institution (SJI) on a journey towards Action Research (AR).

The OER team comprised Research Scientist Dr Lee Shu Shing from the Centre for Research in Pedagogy and Practice at NIE, and then-Teaching Fellow Dr Steven Tan.

AR in education aims to promote teachers' reflections and refinement of their practices—producing local/contextual knowledge—and sharing this knowledge with professional communities. Together, Shu Shing and Steven conducted a series of workshops to introduce AR to teachers.

At the final workshop on 23 Sep 2016 held at SAJS where teachers presented their AR work, Vice-Principal of St Joseph's Institution Junior Mrs Linda Tan thanked all the participating teachers. "In your journey as a teacher, we hope that you can take this learning along and apply it to your work in school to impact teaching and learning," she said in her address. Mrs Tan oversees the professional learning initiative on AR as a representative from the S5 cluster.

**Variety of Action Research** Lower primary English teachers from ACS Junior Mrs Lai Li Lian and Mrs Siti Mohamad shared about their research on the use

of "Hot Seat", a classroom activity that enables pupils to generate new ideas and use them in their writing. They found that it led to better classroom engagement.

Chinese Language teachers from SAJS Ms Joyce Chy, Mr Mu Zhi Ming and Ms Tong Lai Yi devised a five-step plan on teaching Listening Comprehension. The team felt that their students now have a better idea of how to tackle Listening Comprehension.

Mr Michael Lim from SJI did an AR on teacher feedback for upper secondary classes. "I used to overlook small things, including corrections,"

he said. "I could have reduced my workload had I paid greater attention to seemingly minute things from the start." Michael felt his involvement in research gives him a more balanced view on his practices.

Mr Royston Siah from ACS Junior was pleased with the "U-3C" tool that he designed for teaching Science, enabling students to be more exam-smart which ultimately also prepares them for life. Royston felt that although teachers actively look at making lessons more engaging and improving test scores, many of them do not use AR due to time constraints. "The use of AR is to know, by using a scientific method, the degree of improvement," he added.

**OER Researchers as Facilitators** Both Shu Shing and Steven readily assisted teachers and provided them with practical AR tools for their respective studies. The AR workshop provided a good research experience for these novice teacher-researchers, who have come to appreciate how AR can be used to enhance their own teacher-reflection and refine their personal classroom practice.

"I applaud the teachers' dedication and commitment in persevering through their AR projects," Shu Shing said. "I hope they will continue to use AR to inform and reflect on their practices."

Steven added, "The biggest and most enduring change that this workshop has brought about is the teachers' belief that research and practice can go hand-in-hand." ■



## Events by Office of Education Research

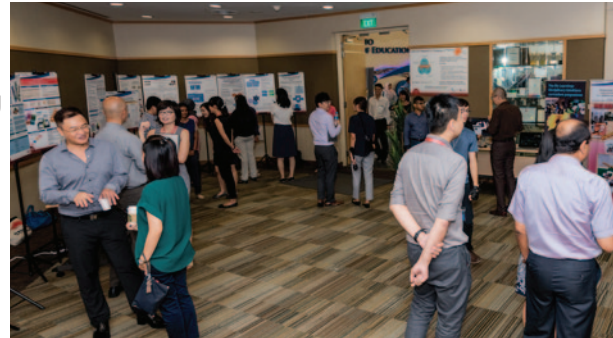
### Inaugural OER Learning Day

OER Learning Day is an in-house research sharing event organized by the Office of Education Research (OER) on 22 Aug 2016. It is aimed at promoting and showcasing education research across various themes and research centres. The event comprised poster exhibits, hands-on demonstrations of research artefacts and experimental set-ups, and a Gallery Walk/Learning Trail for participants.

A total of 32 posters covering a broad range of education research themes were showcased at the event. These were put up by researchers from OER's three research centres, Centre for Research in Pedagogy and Practice, Learning Sciences Lab, and Education and Cognitive Development Lab. Researchers from the Academic Groups at NIE also participated in the poster exhibits.

The Gallery Walk/Learning Trail was a hit among the participants, with many seen navigating through the poster presentations, finding correct answers to the trivia questions for the Learning Trail quiz. Besides understanding the work of other researchers better, the activity also made the whole learning process fun and enjoyable.

OER Learning Day was a success and served as a new platform for NIE's community of researchers and staff to interact and share their research findings and perspectives. With the aim of building up NIE's research capacity and culture, OER is committed to continue doing so with more of such learning endeavours.



### OER Organizes 17th Request for Proposal (RFP) Ideation Session



To continue with efforts in building collaborative dialogue between NIE researchers and stakeholders from the Ministry of Education (MOE) and schools, an ideation session for the 17th RFP was organized by the Office of Education Research on 6 Oct 2016. Held for the second time, the session was attended by colleagues from the Corporate Research Office of MOE, Programme Director (Research) of English Language Institute of Singapore (ELIS), and principals from Yuhua Secondary School and the School of Science and Technology.

Comprising breakout sessions (in the areas of Science, Math and Language) for networking and ideation, the dialogues yielded

positive outcomes on how teachers can partner with researchers, and how schools can provide the necessary support. This opportunity to “match-make” different stakeholders to leverage strong partnerships was a key objective of the session.

Ms Ng Sook Kit, Principal of Yuhua Secondary School found the session to be very useful as it reinforced existing knowledge and made it accessible to all. Dr Christopher Ward, Programme Director (Research) at ELIS, echoed the same sentiment that the opportunity was provided for mutual sharing of research needs with the NIE researchers.

The session also saw presentations by two renowned NIE researchers in their fields, A/P Rita Silver and A/P Toh Tin Lam, who shared their research projects in the area of English and Math respectively. Having had the experience of managing large-scale projects, the sharing offered practical advice for researchers looking to embark on programmatic research.



## Events by Office of Education Research

### International Professors Visit OER

The Office of Education Research (OER) welcomed Professor Peter Freebody, a Professorial Research Fellow with the Faculty of Education and Social Work and a core member of the CoCo Research Centre at The University of Sydney, and Professor Peter Reimann, Professor of Education of the CoCo Research Centre at The University of Sydney from 31 Oct to 2 Nov 2016.

The 3-day event was interspersed with dynamic dialogue sessions, small-group specialized discussions with Principal Investigators (PIs) of Language & Literacy and ICT (Information and Communications Technology) projects, and thoughtful consolidated reviews with the OER management.

Several projects were presented to the professors by the various niche area leaders in their individual areas of expertise. These presentations were then followed by enriching discussions and sharing sessions, where the professors augmented the content with their carefully deliberated inputs. These presentations inspired in-depth discourse on topics including bilingualism and biliteracy, and teacher practice.

Besides sharing their relevant experiences and perspectives in a progressive and summative manner, the professors also contributed valuable insights and international perspectives and ideas on the local educational research landscape.

### Educational Neuroscience Open Symposium

The Office of Education Research (OER) hosted three distinguished neuroscience professors from 8 to 10 Nov 2016. They were Prof Kim Sung-il from Korea University, Prof Roi Cohen-Kadosh from University of Oxford and Prof Andrew Tolmie from Institute of Education, University College London.

As part of their visit, the professors presented at an OER-organized Educational Neuroscience Open Symposium, which was held at the Academy of Singapore Teachers on 9 Nov 2016.

Themed "*Educational Neuroscience: Its Application, Impact and Implications in the Classroom*", the professors delivered presentations that centred on what neuroscience research has revealed about numeracy and science learning and academic motivation. They also highlighted the potential for neuroscience research to contribute to improved educational practices.

Their presentation titles are as follows:

- **Prof Kim Sung-il:** What can neuroscience tell us about Academic Motivation?
- **Prof Roi Cohen-Kadosh:** What does educational neuroscience inform us about numeracy and what are the implications and applications for classroom practices?
- **Prof Andrew Tolmie:** What does educational neuroscience inform us about science learning and what are the implications and applications for classroom practices?

NIE researchers and Ministry of Education officers who attended the symposium had the opportunity to pose questions to the professors regarding the contributions of neuroscience on topics ranging from language acquisition and competence to socioemotional development. They also had the chance to discuss the implications of neuroscience research findings on educational policy and practice in Singapore.



## Upcoming Event by Office of Education Research



### Redesigning Pedagogy International Conference 2017

Organized biennially by National Institute of Education (NIE), the 7th edition of *Redesigning Pedagogy International Conference* provides a global platform for practitioners, researchers, educational leaders and policymakers to collectively debate, generate creative solutions, and actively exchange research ideas and experiences. Held at NIE from **31 May to 2 Jun 2017**, the conference focuses on the theme “*Education for the Future: Creativity, Innovation, Values*”.

Early Bird Registration is open now till **31 Mar 2017**, and registration closes on **28 Apr 2017**.

For full information on the conference, please visit: <https://conference.nie.edu.sg>

For enquiries on the conference, please contact: [rpcsec@nie.edu.sg](mailto:rpcsec@nie.edu.sg)

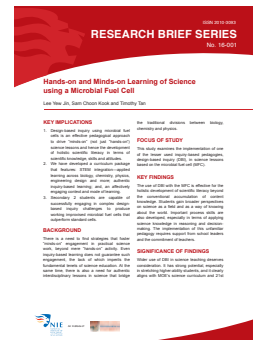
## New Publication

### NIE Research Brief Series

The latest research briefs from the *NIE Research Brief Series* are now publicly available for download on the NIE website. This series features research projects on teacher professional development, student motivation, curriculum innovation and more.

Conceived as a channel for communicating NIE’s research findings to policymakers, school leaders and researchers, the research briefs aim to translate research findings to impact policy and practice.

For download or more information about the research briefs, please visit: <http://www.nie.edu.sg/research/publication/nie-research-brief-series>



## Others

### OER at the Australian Association for Research in Education Conference 2016

In an effort to increase the international awareness of the suite of three NIE journals—*Asia Pacific Journal of Education*, *Pedagogies: An International Journal*, and *Learning: Research & Practice*—the Office of Education Research had an exhibition booth set up at the recent *Australian Association for Research in Education Conference* at Melbourne, Australia in Nov 2016.

The conference saw more than 1,000 participants with a number of them expressing interest in publishing with the journals. The exhibition booth allowed the journal administrators as well as Associate and Book Review Editors, who were present at the conference as presenters, to speak with potential and existing authors, and encourage them to publish their academic papers in the journals.



# Ed Research Highlights

**CONGRATULATIONS TO** our colleagues whose research projects were approved for funding in the 16th Request for Proposals by the Office of Education Research.

Project No.	Project Title	Principal Investigator
OER 11/16 WHM	Qualitative Study of PERI Holistic Assessment Implementation in Primary Schools	Wong Hwei Ming
OER 12/16 VS	Differentiated Instruction as a Means to Inclusion (DIMI)	Vasilios Stroggiolos
OER 13/16 HS	Animated Electronic Storybook and Children's Mother Tongue Development: Tracing the Process and the Outcome with Eyetracking	Sun He
OER 14/16 AGP	Teachers as Adult Learners: Effecting Professional Development and Teacher Change in Primary Chinese Language Teaching and Learning through Variation Theory and Multi-dimensional Reflective Dialogue	Aw Guat Poh
OER 15/16 KKT	The Use of Information Communication and Technologies Tools to Maximise Students' Learning in Physical Education in Singapore Schools	Koh Koon Teck
OER 16/16 SLH	Fostering Science Teachers' Language Awareness: Exploring Impacts on Teachers' Oral Interactions With Students to Support Science Writing	Seah Lay Hoon
AFR 02/16 TLS	Professional Learning Communities in Singapore Schools: The Current Practice and Possibilities for Teacher Practice and Student Learning	Tan Liang See
AFR 03/16 GEP	Positive Teacher Language: Improving Teacher-Student Relationships and Engaging Low Progress Students	Goh Ee Ping Ailsa
AFD 04/16 VV	Hands-on and Online Demonstration Based Pedagogy for Enhancing Student Engagement in Physics	Thirumalai Venky Venkatesan
AFD 05/16 WLH	Streamlining the Designs of Seamless Science Learning for Wider Diffusion	Wong Lung Hsiang
AFR 04/16 TTL	Scaling UP the Education Research: MAGICAL (SUPER-MAGICAL): Use of Comics in Teaching Mathematics	Toh Tin Lam
AFR 05/16 PAO	Promoting Academic Interests in Junior College Students Through a Growth Mindset	Paul Andrew O'Keefe
AFD 06/16 CY	Model-based and Virtual-Reality-enabled Learning and Teaching of Biomolecules	Cai Yiyu

The full list of projects is available on the NIE website ([www.nie.edu.sg](http://www.nie.edu.sg)) under *Research*.

**Errata** The editorial team apologizes for misspelling the names of two Principal Investigators in the congratulatory note for research projects approved for funding in the 15th Request for Proposals under "Research Highlights", ReEd20: Nurturing Innovative Learners.

1. Chua Boon Liang  
OER 01/16 CBL: Justification in Mathematics (JiM)
2. Choy Ban Heng  
OER 03/16 CBH: Portraits of Teacher Noticing during  
Orchestration of Learning Experiences in the Mathematics  
Classrooms



# read

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