



***EZ LEARNING SYMPOSIUM  
24 March 2021  
(Virtual)***

***Reimagining assessment - what matters most***

The East Zone Centre of Excellence for Research (the R@EZ) hosted at Temasek Junior College was launched on 20<sup>th</sup> Aug 2007. This zonal centre aims to provide support for our East Zone colleagues who are keen to leverage upon research to hone their craft of teaching in areas of curriculum design, pedagogy and assessment to enhance Teaching and Learning in their schools. The COE is also broadening our support to build the capacity of key school personnel in areas of curriculum leadership. The East Zone Learning Symposium provides opportunities for teachers to share their research findings from their teaching experiences, innovative pedagogies and good practices to enhance Teaching and Learning in their schools.

R@EZ Steering Committee, warmly welcomes education officers to this year's EZ Learning Symposium. We hope that you will have an enriching and meaningful afternoon.

**Programme**

- 2.00 to 2.10 pm : Welcome and acknowledgments
- 2.10 to 3.10 pm : Keynote address by A/P Mark Baildon, OER NIE
- 3.20 to 4.20pm : Concurrent Breakout Sessions

## Keynote Address:

Assoc Prof Mark Baildon, Associate Dean, Office of Education Research (OER)  
Theme: *Reimagining Assessment in a Changing Landscape*



Mark Baildon is Associate Dean, Partnerships and Analytics, OER, National Institute of Education, Nanyang Technological University. He is also Associate Professor in Humanities and Social Studies Education. He received his B.A. in history and psychology at the University of Rochester and a Masters in Social Sciences at Syracuse University. His PhD is in Curriculum, Teaching, and Educational Policy from Michigan State University. Prior to joining NIE, Mark taught social studies in secondary schools in the United States, Israel, Singapore, Saudi Arabia, and Taiwan. His scholarly interests focus on ways to support social studies inquiry practices, global citizenship education and 21st century literacies in new global contexts.

## Synopsis

In this presentation, I will share some trends in society and education likely to change assessment practice. We will examine the impact and potential of new digital technologies, the rise of big data and Artificial Intelligence, transformations in the workplace, and trends in educational assessment. As schools and classrooms move toward more inclusive forms of education; personalised and student-driven learning; 21<sup>st</sup> century competencies; and enhanced problem-solving, creative and critical thinking and citizenship skills, what are the implications for assessment? The need to reimagine assessment that goes beyond top-down and standardised approaches, examinations, sorting students and assessing routine cognitive skills seems more important than ever. The presentation will share insights from research and on assessment approaches and tools to support student learning in the 21<sup>st</sup> century.

## Concurrent Session

Session	Name of the Presenter(s)	School	Title	Subject
1	Poh-Lim Shir Pei	Poi Ching School	An Art Lesson Study project on using the STP model to design an effective and engaging Mobile Photography module in the SLS portal for the Primary 5 students to acquire and apply basic photography techniques in their art assignments.	Arts
2	Chan Choy Har	Meridian Secondary School	Drawing as a tool for critical thinking as synectic learning in lower secondary art education	Arts
3	Lan Ruiting Kenneth Tham	Victoria School	Whiteboarding Action Research – Enhancing collaborative learning, conceptual understanding and scientific explanation through hands-on tasks in Biology	Biology
4	Sharifah Alkaff Noor Hafizah	Temasek Junior College (IP)	Improving the effectiveness of learning Biology through the use of visual aids	Biology
5	Xu Haiying Yu Wei Woo Ying Teng Toh Wei Ting	Poi Ching School	Apply Quizlet ICT Tool to enhance Pr2 Pupils for Learning Chinese Characters	Chinese Language
6	Tan Chwee Kim Sultanah Ekhsan Hanim Ahmad	Damai Secondary School	Misconceptions vs Slips (SVA)	English
7	Wong Yim Nam	Victoria School	Reading Comprehension: Up Close and Personal	English
8	Tan Shu Fen	Serangoon Garden Secondary School	Incorporation of the Inquiry-Based Learning Approach and Information and Communication Technology into Fieldwork for Geography	Geography
9	Ong Daphne Rachel	Broadrick Secondary School	Creating Learning Opportunities to Help Students Take Ownership of Improving Their Answering Skills in History	History
10	Syed Danial Bin Syed Taha	Ping Yi Secondary School	Time-Traveling Teacher: Blended-Learning in a Collaborative History Classroom	BB (History)
11	Ang Sock Kiang Miss Jermaine Tan	Broadrick Secondary School	Harnessing SLS to enable DI in Mathematics.	Mathematics
12	Ho Foo Him	Temasek Junior College	Will Geogebra Help Students to Solve Problems Involving Conics in Further Mathematics?	Mathematics
13	Tan Qing Quan Rion	St Anthony's Canossian Secondary School	Using Action Research to Incorporate Productive Failure Learning Design in Trigonometry Lessons	Mathematics
14	Azyanti Mohamed Mudakir Fazillah Mohamed Ismail Azizah Abdul Rahim	MOE Language Centre (Bishan) & Ping Yi Secondary School	Building Perspective Taking Among Students	Mother Tongue (ML)

Session	Name of the Presenter(s)	School	Title	Subject
15	Dr. Sun Li Mr Simon Lim Mdm Liu Yan	Loyang View Secondary School	以评促学为导向的作文旁注式评价模式的应用实践	Mother Tongue (CL)
16	Mr Koh Di Sheng Alwyn Mdm Tan Bee Yong	Springfield Secondary School	Effective Questioning and Feedback using Ladder of Feedback	Physics
17	Koh Chee Kiang Pang Jeng Heng	Victoria School	Learning Study in Physics (Light - Converging Lens)	Physics
18	James Long	Haig Girls' School	Sustaining Students Interest in Science Education	Science
19	Lim Wu Yi	Temasek Primary School	The Fun Way to Learn via a Digital Role-Playing Game	Science
20	Mrs Vanessa Vinodhen Mr Choong Tze Hong Mdm Siti Zaleha Md Idris	Junyuan Secondary School	Improving teacher's assessment literacy through the use of rubrics in lower secondary science	Science

## Session 1

Presenter(s): Poh-Lim Shir Pei  
School: Poi Ching School  
Title: An Art Lesson Study project on using the STP model to design an effective and engaging Mobile Photography module in the SLS portal for the Primary 5 students to acquire and apply basic photography techniques in their art assignments.  
Subject Area: Arts

### **Synopsis:**

As this was Poi Ching School's first year in introducing mobile photography lessons in the Primary 5 Art curriculum, the teachers have no prior knowledge nor experience in teaching photography. After determining the learning goals and outcomes the students would be able to achieve and do at the end of the module, the teachers began to craft an effective lesson unit plan using the STP model to achieve the desired learning goals. The results of the students' survey showed that most students were actively engaged during the photography lessons. All students were able to apply the basic photography techniques in their photographs. As all the photographs were uploaded into the SLS portal, all students were able to view and give feedback to their peers online. Teachers were also able to assess the quality of the students' photographs in the SLS portal. The presenter will share sample lesson resources and take the participants through a hands-on photography activity using the SLS platform.

## Session 2

Presenter(s): Chan Choy Har  
School: Meridian Secondary School  
Title: Drawing as a tool for critical thinking as synectic learning in lower secondary art education  
Subject Area: Arts

### **Synopsis:**

In lower secondary teaching, most teachers do not adopt synectic learning techniques to encourage students to connect what are seemingly unrelated ideas. Educational researchers argue that synectic learning - asking students to make linkages between unrelated ideas makes the familiar strange, and the strange familiar. The outcome, it is argued, is a learning process that encourages critical thinking. In my article, I discussed how getting lower secondary students to draw a work of art based on two unrelated ideas can transform art into a subject that can help weak students improve their vocabulary in addition to enhancing their general knowledge relevant to other disciplines.

### Session 3

Presenter(s): Lan Ruiting  
Kenneth Tham  
School: Victoria School  
Title: Whiteboarding Action Research – Enhancing collaborative learning, conceptual understanding and scientific explanation through hands-on tasks in Biology  
Subject Area: Biology

#### **Synopsis:**

One of the primary challenges in education today is students' overreliance on the rote memorisation of knowledge and facts. The subject of Biology is of no exception. We have observed that students often memorise conceptual explanations from textbooks, learning resources and even teacher verbatim. It therefore remains a challenge to equip students with the necessary skills to build their own scientific explanations. Against this backdrop, the objective of our study is to integrate hands-on Biology tasks with whiteboarding, where the whiteboard serves as a tool for students to present their findings using scientific terminology and diagrams. By making thinking visible, benefits are gained on two fronts. One, students can enhance their conceptual understanding and deepen their learning (Ritchhart, Church and Morrison, 2013). Two, it serves as informal assessment for teachers to ascertain students' abilities to communicate scientific concepts. Our preliminary findings have shown that participants found the whiteboarding activities helpful and enjoyable, and through them gained a stronger grasp of the Biology concepts taught in class.

### Session 4

Presenter(s): Sharifah Alkaff  
Noor Hafizah  
School: Temasek Junior College (IP)  
Title: Improving the effectiveness of learning Biology through the use of visual aids  
Subject Area: Biology

#### **Synopsis:**

This sharing outlines a pedagogic approach exploring the use of visualization techniques in the teaching of Biology. Studies suggest that visual learners learn better from visual aids such as diagrams, charts and graphs when used together with verbal instruction. The different methods we will discuss include:

- (1) interpreting visuals (reading captions and labels),
- (2) coordinating figures and text and
- (3) use of student-completed visuals, along with a critique for groups to show their work and receive formative feedback.

These visual-comprehension exercises are designed to capture students' knowledge, understanding, and misconceptions in an efficient and effective manner.

## Session 5

Presenter(s): Xu Haiying  
Yu Wei  
Woo Ying Teng  
Toh Wei Ting  
School: Poi Ching School  
Title: Apply Quizlet ICT Tool to enhance Pr2 Pupils for Learning Chinese Characters  
Subject Area: Chinese Language

### **Synopsis:**

The amount of vocabulary at the primary school level is rather large, therefore students find it hard to remember and understand the meaning of many Chinese words. In order to solve this problem, the project utilises Quizlet, an ICT tool, to design games and activities which can be accessed using a smartphone, tablet or computer anytime and anywhere. Students can play vocabulary related games at home and learn Chinese words at the same time. Through the use of Quizlet, students can experience joy in learning while improving their ability to read and understand different vocabulary.

The specific methodology of this research is as follows: teachers use Quizlet to create learning contents of Pinyin literacy, word meaning interpretation, word collocation, word selection, etc.; after seeking parental consent and support, students can play the Quizlet games and activities at home; teachers will update the learning content, inform parents timely and monitor the students' participation and learning progress in the Quizlet platform.

Four P2 classes participated in this research. Throughout the first half of the year, the students learnt 25 texts from 2A Yunyu textbooks and more than 400 Chinese characters. We analyzed the students' learning progress using a combination of quantitative research and questionnaires.

Comparison of pre-test and post-test results shows that their average score increased from 81% to 89%. It is also observed that students' understanding of words has improved, the class participation rate of students has increased, and parents have given strong support to allow their children to use Quizlet at home. It is very encouraging to know that more than 80% of children like to play Quizlet word games.

Through this research, we conclude that the learning content in Quizlet activities must be appropriate to cater to the level of understanding of the P2 students, and we also need the strong support of parents. Teachers must constantly follow up with the students' learning progress, and often encourage students to engage in self-directed learning at home so that they can learn more effectively.

## Session 6

Presenter(s): Tan Chwee Kim  
Sultanah Ekhsan Hanim Ahmad  
School: Damai Secondary School  
Title: Misconceptions vs Slips (SVA)  
Subject Area: English

### **Synopsis:**

Many students often make mistakes in Subject-Verb Agreement (SVA) in their writing assignments and these mistakes have set English Language teachers wondering how such mistakes come about. Hence, this study aims to find out whether the SVA mistakes made in writing pieces by Secondary 1 students is due to lack of knowledge of the rules governing SVA or due to a grammatical slip. Lorri (2009) said that the best methods of teaching are those that take into account all learners in a class and teachers pay attention to students of different academic ability, language ability, culture and socioeconomic backgrounds. An intervention was put in place to support students of different abilities. Quantitative and qualitative data are gathered and it is found to be useful in informing teachers the common SVA mistakes students made and the impact of pedagogical strategies such as Noticing and Differentiated Instructions (DI) on the learners and their learning.



## Session 7

Presenter(s): Wong Yim Nam  
School: Victoria School  
Title: Reading Comprehension: Up Close and Personal  
Subject Area: English

### **Synopsis:**

Most students find reading comprehension assignments or assessments not easy as it requires hard work on the part of the students to plough through the text and they may only have a partial understanding of the text at the end of it. Students may also be discouraged when they have not experienced success in reading comprehension assignments or assessments. Likewise, teachers find it challenging to teach reading comprehension because it is difficult to teach students to read and understand a text. Some teachers teach reading comprehension by using think aloud strategies and getting the students to annotate the text. Such strategies, however, may not necessarily lead to students knowing what to focus on when reading a text. There are also some teachers who believe that the only way to improve reading comprehension is to have lots of drill and practice.

This study hopes to enhance students' understanding of the text by enabling the students to interact more with the text as they read the text. Many teachers are familiar with the use of think-aloud strategies and annotation to help students interact with the text. The teachers doing this study however felt that in addition to the above, there is a need for teachers to use quality questioning during class discussion on the text during a reading comprehension lesson as there has been much literature on the use of quality questioning to deepen thinking. The questioning focuses on using significant questions that promote thinking about the qualitative features of the text including the purpose and meaning of the text, the writer's intention, the choice of words used by the writer and its impact on the readers and the organisational structure of the text. By directing the students' attention to these significant questions through having a class discussion of the text, the teacher intentionally engages the students cognitively and meta-cognitively. The students in the process would also have learnt how to be active readers as they would be asking pertinent questions about the text, making connections within a text, inferring and predicting. As their thinking becomes more and more focused, they have subconsciously probed deeper into the text. They would therefore have developed a deeper understanding of the text, thus improving their literal and inferential comprehension of the text. Furthermore, the students in the process would have developed certain behaviours and habits that good readers should have.

In this study, a simple pre-test and post-test were developed to help the teachers understand the impact of the intervention strategy, that is, the use of significant questions about the text through qualitative questioning in class. The intervention strategy was introduced after the pre-test was conducted. A post-test was subsequently conducted. Results from the post-test have yielded some preliminary findings and shed some light on the effectiveness of the intervention for both the students and the teachers.

### **Session 8**

Presenter(s): Tan Shu Fen  
School: Serangoon Garden Secondary School  
Title: Incorporation of the Inquiry-Based Learning Approach and Information and Communication Technology into Fieldwork for Geography  
Subject Area: Geography

#### **Synopsis:**

This action research study incorporated the Inquiry-Based Learning (IBL) approach and Information and Communication Technology (ICT) into fieldwork, as doing so offered opportunities for students to move beyond being passive recipients of knowledge in geography. Students were able to transform their ideas into formalised understanding and use them for further questioning. Students thus developed their abilities to appreciate geographical phenomenon, interpret primary and secondary sources, weigh evidence, and advance a clear argument that deepened their geographical understanding.

### **Session 9**

Presenter(s): Ong Daphne Rachel  
School: Broadrick Secondary School  
Title: Creating Learning Opportunities to Help Students Take Ownership of Improving Their Answering Skills in History  
Subject Area: History

#### **Synopsis:**

This research study offers an approach that encourages a shift from 'teaching' to 'helping students take ownership of their own learning'. This approach seeks to create learning opportunities to help students take ownership of and sharpen their answering skills in history source-based case study (SBCS) questions. Four strategies can be used to transform summative assessment (SA) into formative assessment (FA) where feedback, questioning, collaboration, and differentiated sense-making are blended into a model of student-centred learning. By creating such opportunities for students, they can establish their own route of learning, know where to head towards, and determine how best to get there (Assessment Reform Group, 2002).

## Session 10

Presenter(s): Syed Danial Bin Syed Taha  
School: Ping Yi Secondary School  
Title: Time-Traveling Teacher: Blended-Learning in a Collaborative History Classroom  
Subject Area: BB (History)

### **Synopsis:**

Blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods (Friesen, Norm; 2012). Together with the von Restorff effect, strategies are developed to maximise learning outcomes for students that are digital natives.

In addition, to foster a climate of collaboration, an eclectic mix of pedagogies are utilised in the teaching of both SEQ and SBQ skills. Inter alia, these included Brain-Based Learning (Jensen, 2006), Formative Assessment strategies (including Assessment AS Learning) as well as a myriad of Collaborative Learning strategies.

## Session 11

Presenter(s): Ang Sock Kiang  
Miss Jermaine Tan  
School: Broadrick Secondary School  
Title: Harnessing SLS to enable DI in Mathematics.  
Subject Area: Mathematics

### **Synopsis:**

This sharing draws upon the results of a study which involves a sample class of Secondary Two Normal Academic students and their teacher. Harnessing the affordances of SLS to enable Differentiated Instructions (DI) practices that focus on teaching up (Tomlinson, 2015) that deepen students' learning of mathematics. This study sought to find out whether DI through SLS, guided by the SLS Pedagogical Scaffold, has the potential in fostering engagement, joy and performance of students in difficult Mathematics topics, such as Factorisation of Quadratic Expressions. The insights that will be shared during the session are based on multiple data sources: survey questionnaires, classroom observations and interviews involving teachers and students. The session will resonate well with educators seeking to promote engagement, joy of learning and searching for DI practices enacted via SLS.

## Session 12

Presenter(s): Ho Foo Him  
School: Temasek Junior College  
Title: Will Geogebra Help Students to Solve Problems Involving Conics in Further Mathematics?  
Subject Area: Mathematics

### **Synopsis:**

Conics was included in the H2 Further Mathematics syllabus (9264) since 2016. Feedback gathered from teachers and students revealed that students found this topic most challenging and difficult to apply what they have learnt. To help students to visualise mathematical properties through interactions with mathematical objects dynamically, Geogebra applets were deliberately constructed and extensively used in the teaching and learning of this topic in 2019. This presentation is part of an action research project undertaken by some Mathematics teachers with an aim of exploring how Geogebra applets can be developed to help students to “visualise” mathematical ideas and properties; make connections between mathematical concepts and representations. The presenter will share one aspect of the project which is on the design and the outcomes of a classroom assessment that make use of Geogebra applets.

## Session 13

Presenter(s): Tan Qing Quan Rion  
School: St Anthony's Canossian Secondary School  
Title: Using Action Research to Incorporate Productive Failure Learning Design in Trigonometry Lessons  
Subject Area: Mathematics

### **Synopsis:**

This research project was conducted in St Anthony's Canossian Secondary School, a girls' school, to develop the students' ability to solve mathematical problems in a real-world context. Manu Kapur's Productive Failure learning design (2008) was adapted in this research project to provide a learning experience that enabled the students to be engaged in mathematical discourse while striving to solve a complex mathematical problem in a real-world context.

Productive Failure comprises of two phases (Kapur & Bielaczyc, 2012). Phase 1 provides students with opportunities to generate and explore representations and solution methods (RSMs), thus enabling them to take ownership of their learning by ideating and negotiating meanings with one another in a collaborative manner. Phase 2 endeavours to provide students with opportunities to be engaged in a mathematical discourse, facilitated by the teacher by comparing and contrasting students-generated RSMs and building on the students' inputs in order to shape the discussion towards canonical RSMs. Through this learning experience, the teacher develops in the students metacognitive skills using questions to deepen their learning, thus, by extension, an attitude to assess their own learning for their learning.

Lesson study was undertaken as part of the Action Research cycle in this research project to refine the adapted Productive Failure learning design. Results gathered from this research paper suggest that the adapted Productive Failure learning design enhances students' learning of Trigonometry.

## Session 14

Presenter(s): Azyanti Mohamed Mudakir  
Fazillah Mohamed Ismail  
Azizah Abdul Rahim  
School: MOE Language Centre (Bishan) &  
Ping Yi Secondary School  
Title: Building Perspective Taking Among Students  
Subject Area: Mother Tongue (ML)

### **Synopsis:**

A research project was initiated to guide students to understand perspective taking, indirectly making them aware of presence of multiple viewpoints to an issue. Discussions were launched online to build students' confidence in taking various perspectives of selected issues before classroom discussions were conducted to allow them to readily verbalise their thoughts and opinions.

## Session 15

Presenter(s): Dr. Sun Li  
Mr Simon Lim  
Mdm Liu Yan  
School: Loyang View Secondary School  
Title: 以评促学为导向的作文旁注式评价模式的应用实践  
Subject Area: Mother Tongue (CL)

### **Synopsis:**

评价的目的主要是了解学生的学习历程，以评促教，以评促学。作文的评价要关注学生的结果，更要关注学习的过程。在作文教学过程中，借助旁注将评价任务镶嵌在各个部分，能解决学生在写作过程中遇到的个别或局部性问题。旁注式评价模式基于认知心理学视角，以问题导学促学，引导学生在写作技能、选材结构、语言表达等方面进行评价，帮助学生发展认知能力、交互能力和表达能力，从而促进学生个性写作的学习。

## Session 16

Presenter(s): Mr Koh Di Sheng Alwyn  
Mdm Tan Bee Yong  
School: Springfield Secondary School  
Title: Effective Questioning and Feedback using Ladder of Feedback  
Subject Area: Physics

### **Synopsis:**

This project is an extension of our team's 2018 PLT Project – Physics Alternative Assessment, which was students' Weighted Assessment 2 (WA2). In 2018, the Secondary 3 Physics students embarked on a group project whereby they had to choose a topic, design a micro-lesson (rap, song, video or demonstration etc), prepare for and make a presentation in front of their classmates. Classmates then asked questions to the presenting groups and completed their Reflection Logs to provide further feedback. Teachers then graded the students using an Assessment Rubrics. Our team realised that the students' feedback in the Reflection Logs were often short phrases or sentences that were not useful for teachers to gauge their level of understanding. In addition, we noticed that at the end of each presentation, students often had little or no questions for the presenting groups. In order to make students' learning more complete and meaningful for WA2, our team embarked on this Project in 2019 - Encourage Effective Questioning & Feedback from students using the Ladder of feedback.

Students were guided to give constructive feedback using 'Ladder of Feedback' (Clarify, Value, State Concerns, Suggest). To encourage our learners to ask effective questions, we also guided them to use a simple structure of 'I noticed .... and I wondered ...' to help them hone their observation skills and critical thinking skills. In this study, majority of the students found the Ladder of feedback easy to use, and agreed that giving feedback this way is more constructive and meaningful. This in turn helps to improve their understanding of Physics. In their written feedback, our team also observed that the students' quality of feedback has improved from the previous year. This mode of asking effective questions and giving constructive feedback is also recommended to be applied in various subject areas.

## Session 17

Presenter(s): Koh Chee Kiang  
Pang Jeng Heng  
School: Victoria School  
Title: Learning Study in Physics (Light - Converging Lens)  
Subject Area: Physics

### **Synopsis:**

Light is characterized by rays which is not visible and as such is abstract to students understanding. Our learning study aims to help students understand the characteristics of images formed by converging lens using Variation Theory.

Diagnostic test conducted for 53 students led to the identification of the 'object of learning'. Four Student Learning Space (SLS) activities, lab activities in pair work, generalisations and a pre- & post-lesson test were designed and conducted for 2 groups of students in sequence with refinement. SLS was also used for better monitoring on the progress of students, provide autonomy in the progress of the lesson and timely feedback.

Lesson observation, post-lesson test and FGD with students suggest that the intervention is effective to help students attain the object of learning identified, to achieve the level of understanding. Students are better able to discern the characteristic of the images through contrasting and experiential observations.

## Session 18

Presenter(s): James Long  
School: Haig Girls' School  
Title: Sustaining Students Interest in Science Education  
Subject Area: Science

### **Synopsis:**

Singapore needs scientists to solve environmental problems such as climate change and water scarcity. Students who are interested in science are more likely to choose science-related careers, the author set out to develop a project-based learning curriculum with an inquiry-based approach that aimed to increase students' interest in science. From 2016 to 2018, the author and his team surveyed 10% of the student population from Grades 3, 4, 5, and 6 twice a year to ascertain the reasons for their expressed interest or disinterest in learning science through different modes of instruction such as project-based learning and experimentation. In addition, one student from every class in Grades 4 and 5 was interviewed in 2017, and one student from every class in Grades 5 and 6 was interviewed in 2018. Qualitative data from survey questionnaires and transcripts from these interviews were coded based on a priori categories derived from literature on self-determination, motivation, interest, and research on lesson features that interest students. Results show that students are interested in learning science through both experimentation and project-based learning, with a strong preference for the latter. Their main reasons for preferring project-based learning are 'relatedness' and 'autonomy'. The students enjoy science when they are in unschool-like learning environments that allow them to collaborate and have the freedom to chart the direction of their learning. There is also preliminary evidence to suggest that the interest in learning science through project-based learning is sustained. This is significant as, if triggered interest can become personal interest, students may become more involved and attentive during lessons. These findings suggest that enacting such a science curriculum is possible in a results-driven and performance-seeking education system.

## Session 19

Presenter(s): Lim Wu Yi  
School: Temasek Primary School  
Title: The Fun Way to Learn via a Digital Role-Playing Game  
Subject Area: Science

### **Synopsis:**

The learners of the 21st century acquire knowledge differently as compared to the learners of the late 20th century. These digital natives are highly accustomed to multimedia content in the form of games and interactive websites. As such, it is important for us as educators to keep abreast of the current educational methodologies and integrate them with digital platforms in order to arouse our learners' interest. In our opinion, the current 'chalk and talk' method of disseminating information on environmental issues is ineffective, as pupils remain passive during the lessons and have little opportunity to reflect on how their simple actions (such as littering in the ocean) can impact the environment. Consequently, pupils have a tendency to drift away from the taught lesson after the first ten minutes. Hence, our research team sought a way to awaken primary school pupils' interest in learning via the use of a multimedia and multisensory approach which still developed pupils' skills.

This research study does three things to kindle pupils' interest in learning about environmental issues. First, it introduces a digital platform, called 'Symbiosis', that offers pupils an environmental role-playing game which enables them to experience a series of events in a multitude of ways. Second, Symbiosis incorporates the environmentally sustainable disciplinary way of thinking and practice by breaking down the relevant skills into manageable (a series of events) and explicit (a set of dialogue prompts) steps. These events and dialogue prompts were crafted by our research team to mimic the tasks performed by experts. In addition, we allocated opportunities within the game for pupils to practise the environmentally sustainable way of thinking and receive immediate feedback on their attempts to do so. Third, Symbiosis makes use of multimedia features to offer pupils the simultaneous use of two or more sensory modes to absorb and analyse contextual information within the game. This multisensory approach helps to engage pupils with different learning styles. Although Symbiosis was rolled out only for Primary 3 (Grade 3) and Primary 6 (Grade 6) pupils in 2018, we believe it is suitable for pupils at all levels of primary school.



## Session 20

Presenter(s): Mrs Vanessa Vinodhen  
Mr Choong Tze Hong  
Mdm Siti Zaleha Md Idris  
School: Junyuan Secondary School  
Title: Improving teacher's assessment literacy through the use of rubrics in lower secondary science  
Subject Area: Science

### **Synopsis:**

The learning of science as an inquiry encourages students to learn science as beyond a body of facts but as a form of human endeavour. There has been a significant reform in the assessment structure in science education as highlighted in a study conducted in Hong Kong (Cheng & Cheung, 2005). This reform, observed in Singapore as well, reflects a shift towards more formative style assessment where student achievement is elicited, interpreted and used by teachers (Black & William, 2009). There is an increased amount of reasoning involved and this ensures the science content is thoroughly analysed before the answer is given (Donovan & Bransford, 2005).

This project aims to describe the process in improving teachers' assessment literacy through the use of rubrics. Rubrics are useful in documenting student learning (Molee, 2011) as well as providing students with feedback. Students are able to identify, describe, and apply their learning based on the rubrics. However, it is important to note that rubrics are often more focused on evaluating student achievement rather than improvement (William & Leahy, 2015). Therefore the manner of implementation of the rubrics is crucial in allowing for a suitable alignment to formative assessment. This project involved lower secondary teacher creating a set of rubrics to assess a particular assignment tasked to lower secondary science students.