Workshop- WOR006

The Role of Mediated Learning Experience (M.L.E.) in the Teaching and Learning of Mathematics

Wendy TAN, Yio Chu Kang Primary School, Singapore
Mathematics Education

Abstract

Mediated Learning Experience (M.L.E.) is developed by Feuerstein to explain individual's different propensities for learning. It has been widely used in Israel, Venezuela, United States, Canada and in Europe where adolescents and adults have been culturally disadvantaged or mentally handicapped. The theory and research suggest that M.L.E. plays an important role in developing student's underlying cognitive functions, that is, the ability to learn and become an autonomous thinker, as well as intrinsic motivation, which is the love of learning and the extension of interests. At the core of M.L.E. is the theory of Structural Cognitive Modifiability (S.C.M.), which states that students' current low level of functioning should not dictate their future outcomes, but that it should be perceived as the baseline for potential change in their ability to learn. This change hinges on the quality of teacher-student interaction as it is through this interaction that the cognitive and motivational functions needed for learning will be modified. The approach also stems from the belief that change is possible and having the skills and strategies to bring about that change.

M.L.E. approach is able to develop in students the 21st century competencies and desired outcomes designed by MOE, which include being active contributors and self-directed learners and the 21st century competencies such as critical and inventive thinking and information and communication skills. It underpins the holistic education that school provides to better prepare the students to thrive in a fast-changing and highly-connected world where they need to be discerning in judgement, think independently and critically, communicate effectively, question, reflect, take responsibility for their own learning, are innovative, and strive for excellence.

In 2014, a class of 26 Primary Six students sat for their P.S.L.E. and all of them, including those who scored u grades and those who were at risk of scoring that grade, were eligible for secondary schools. In fact, five of them were offered Express stream as they had obtained relatively good grades. Ever since taking over the class in 2013, M.L.E. had been actively used to develop the students' cognitive functions and eventually learning as a whole.

Keyword: Mathematics Education, Metacognition

Workshop- WOR009

Using Metacognitive tools to scaffold Malay language primary school students sentence writing skills

Ghazali MOHAMED IBRAHIM, Townsville Primary School, Singapore
Language and Literacy Education

Abstract

Constructing different types of well-formed sentence structures is an essential skill and many Malay language primary school students struggle with this skill. Unfortunately, research related to the use of metacognitive tools to improve the sentence writing performance of Malay language primary school students have rarely been addressed. This study aims to develop a sentence writing strategy to examine the effects of using formulas as metacognitive tools on the writing performance of 20 primary 3 Malay language students. To evaluate the use of formulas as metacognitive tools to construct 3 types of well-formed sentence structures, pre- and post-tests were carried out. The results support the use of formulas as metacognitive tools to construct the different types of sentence structures. The findings from the knowledge surveys that were conducted before the pre- and post test also indicated an increase of students' efficacy of constructing different types of well-formed sentence structure.

(Presentation in Malay language)

Formulas:
a.Formula 1: S + A(b)
b.Formula 2: S + A(b)+ Bagaimana (C) (P)
c.Formula 1 or 2 + Mana + Bila
d.Formula 1 or 2 + Bila + Mana
e.Formula 1 or 2 + Mengapa : S + A(b)
f.Formula 1 or 2 + Tujuan : A
g.Formula 1 or 2 + Perbandingan
h.Formula 1 or 2 + Sama+sama
i.Formula 1 or 2 + Harapan
j.Formula `1 or 2 + Bertentangan

Keyword: Assessment, Cognitive Processes/Development

Workshop- WOR011

Computational and Design Thinking with Makey Makey

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Emma Knight, Australian International School Hong Kong, Hong Kong
IT in Education

Abstract

Education is the change agent for students to develop the necessary skills and dispositions to find success in the 21st century. They need to be exposed to computational skills beyond the confines of a computer or device.
This workshop will showcase how students can incorporate design thinking with coding to create an innovative, interactive project. Students will up skill themselves with the tools necessary for their particular project. This promotes critical and creative thinking, collaboration and problem solving. The 21st century dispositions of questioning, flexible and fluid thinking, and persistence are all fostered and developed through involvement in this project.
Technology is often taught in isolation and students are not the drivers of their own learning journey. The Makey Makey is an electronic invention kit that turns everyday objects into touchpads and connects them with a computer program via a circuit board using closed loop electrical signals. This tool provides students with the opportunity for organic inquiry and to see connections across contexts. Music, Art, Design, Science and Mathematical thinking can be integrated into this project allowing for clear interdisciplinary links.
The workshop will examine the Makey Makey project conducted at The Australian International School Hong Kong. It will showcase student learning in action as well as provide participants with the opportunity to explore the use of Makey Makey. Pedagogical links and outcomes will be outlined.
Students involved in this project begin to see a relationship between subjects involved in STEAM as well as life outside the classroom. As adventurous thinkers and learners they develop the necessary dispositions to deal with open-ended problems and are preparing to compete in a world where technology is ingrained in everything they do.

Keyword: 21st Century Competencies, Collaboration/Collaborative Learning

Workshop- WOR013

"Enhancing the Teaching and Learning in Expansion and Factorisation of Quadratic Expressions"

ANG Sock Kiang, Broadrick Secondary School, Singapore
Mathematics Education

Abstract

Many teachers in Broadrick feel that many Normal (Academic) (NA) students find algebra rather challenging and have difficulties scoring for algebra questions. Particularly difficult are in the areas of algebraic expansion and factorisation. This is supported by findings from a diagnostic test taken by the 2016 Secondary 2NA students which show that students have difficulties in Expansion of Algebraic Expressions. Another diagnostic test for the 2016 Secondary 3NA students showed that students are very weak in Algebraic Factorisation. Moreover, trend analysis of the past 5 years GCE N-Level examination questions indicate that Algebraic Expansion and Factorisation was heavily assessed, showing that this is an important topic which students should focus on.

To attempt to rectify this weakness, the Mathematics Professional Learning Team (PLT) conducted a lesson study to strengthen the teaching and learning of Algebraic Expansion and Factorisation in Secondary 2NA stream. Research literature has shown that the Concrete-Pictorial- Abstract (C-P- A) approach can help students to grasp abstract mathematical ideas more effectively. As such, our team adopted the use of Alge-discs as a form of Concrete teaching aid to introduce expansion and thereafter, the use of the Multiplication Frame (MF) as a form of Pictorial representation to eventually lead students to form Algebraic expressions in Abstract form. As Factorisation is a reverse process of Expansion, a similar approach was introduced to the teaching and learning of Factorisation where the pictorial representation using the MF was recommended as a "stepping stone" for the students.

Results from our study show that the C-P- A approach has indeed substantially improved our students' ability to perform algebraic expansion and factorisation using either the MF approach or abstractly. The Making Thinking Visible routine of Claim-Support-Question and the Assessment for Learning Strategy, Exit Pass, were also used in the process.

Keyword: Mathematics Education, Teacher Education/Development

Workshop- WOR017

Tinkering Science in STEM Education

Noor Isham SANIF, Madrasah Irsyad Zuhri Al Islamiah, Singapore
Science Education

Abstract

This 90 minutes workshop proposes a hands-on activity to highlight and explore how a Tinkering Science, help participants to apply simple constructivist approach in STEM (Science Technology Engineering Mathematics) making greater meaning in Science. Presenter proposes Tinkering Science as a form of a constructivist theory of learning. He will share the basis of STEM and knowledge is not simply transmitted from teacher to learner but actively constructed by the mind of the learner. The presenter will also develop through constructionism, learners are more likely to make new ideas while actively engaged in making an external artefact. These hands-on activity support the construction of knowledge within the context of building personally meaningful artefacts. This activity designs opportunities for participants to “think with their hands” in order to construct meaning and understanding. This Tinkering Science Workshop activities and investigations are designed to encourage participants to “complexity” their thinking over workshop period. The variety of materials and variables available for experimentation allow learners to enter at a point where they are comfortable starting, and then alter and their designs as they develop new ideas. This workshop activities are designed to be exploratory, whimsical, inspired, and surprising. Building and constructing activity is a platform for the learner to investigate concepts at the intersection of technology, science, engineering, and mathematics. Participants will receive step-by-step instruction and facilitated as they create object, handheld in exploring the process of testing, questioning, and occasionally failing. An ideal condition to this workshop requires each participant be given one set of STEM materials (which will be provided during the workshop) and structured process for personal STEM reflection. By the end of the workshop, each participant will bring home a conclusive and meaningful STEM experience and will be able to apply almost similar STEM process back to their very own classroom lessons.

Keyword: 21st Century Competencies, Critical and Creative Thinking

Workshop- WOR020

Teaching to nurture creativity and divergent thinking in Mathematics

LYE Wai Leng, National Junior College, Singapore
LIEW Yew Tze, National Junior College, Singapore
CHONG Hur Ling Marcus, National Junior College, Singapore
Mathematics Education

Abstract

Good thinking involves the ability to think, the attitude towards it, and the alertness to opportunities for thinking. A good way to develop all three aspects is to make thinking visible through the use of thinking routines. These routines can help students hone their competencies in interpreting information, analysing statements, as well as formulating and verifying conjectures while developing positive dispositions like open-mindedness and imaginativeness.

Students are not often provided with the opportunities to articulate their thoughts aloud, reflect and contribute to their classmates' answers. As such, retention of concepts and knowledge remains weak. To promote a classroom where critical and creative thinking is always present, a deliberate approach must be taken to teach students explicit thinking and reasoning. It involves teachers providing the necessary structure to encourage students to think out aloud and make conjectures.

The use of the "See-Think-Wonder" routine at the start of classroom lesson units have a positive effect on classroom ethos. Instead of simply covering individual skills, students look for patterns and relationships as well as making connections between mathematical ideas and concepts. Another strength of this routine is that it helps teachers to uncover students' insights and misconceptions about mathematical concepts. In addition, when information is shared between students, they build on each other's' thinking to create richer discussions.

Through the use of "Claim, Support, Question" routine, students learn to identify truth claims and explore strategies for uncovering truth. The routine helps students develop thoughtful interpretations by encouraging them to reason with evidence. Furthermore, this learning environment encourages collaborative learning to take place as students explore a problem together. They learn to listen to one another's responses, reflect and contribute meaningful ideas to become active learners.

The presenter will examine the use of "See, Think, Wonder" and "Claim, Support, Question" for classroom teaching, as well as for assessment. Through the hands-on session and the diversity of topics shared, participants will also develop an alertness to opportunities that lend themselves to the thinking routines, which in itself, is the development of good thinking.

Keyword: 21st Century Competencies, Critical and Creative Thinking

Workshop- WOR021

How to teach onomatopoeia in Intermediate Malay

Jyhwee SEW, National University Of Singapore, Singapore
Language and Literacy Education

Abstract

This presentation examines the pedagogy of Malay onomatopoeia in a novel written by the local author Isa Kamari. The discussion on language pedagogy begins with an introduction to the novel before zooming in on two pages of the print material selected for teaching Malay as a foreign language. The semantic analysis of the text leads to a discovery of eight examples of onomatopoeia words exploited by the Singapore author as part of his creative stylistics. As a cross-reference strategy in language teaching, English sound-symbolic words are introduced to break the mono-language matrix of comprehension with a YouTube video clip. Such comparison invokes a bilingual scaffolding to understand onomatopoeia as a common lexical category based on an auditory epistemology. A critical-creative aspect of the Malay lesson is the introduction of a second video clip showing two foreign learners attempting to reconfigure Japanese onomatopoeia. This teaching component is included for developing a creative dimension in the name of ubiquity learning. A Malay-Japanese onomatopoeia comparison becomes a relevant cross-cultural teaching advantage because Malay learners, who watch other peers struggling to make use of the Japanese sound symbolic lexical items in daily interaction, may be motivated to study and use the lexical category. In foreign language pedagogy, viewing similar language learning experience digitally breaks the monotony of beam-and-tell in a tertiary language classroom. Furthermore, introducing sound as a locus of authentic Malay knowledge reopens the folk window to the acquisition of Malay onomatopoeia for learners. Arguably, cross-language comparison of onomatopoeic data motivates language learners with a positive experience invoking the social mimicry of learning from watching other language learners managing the topic in another language. Making explicit reference to modern artists such as Shila Amzah, who repositions onomatopoeia in music production, adds an emphasis on the significance of the sound category seemly forgotten by the speech community. Important to foreign language pedagogy, the technique of delivery injects creative rejuvenation by means of a typology approach that is incorporated ubiquitously for teaching Malay as foreign language at tertiary level.

Keyword: Curriculum & Pedagogical Innovation, Language and Education

Workshop- WOR022

"Breaking the Mould" - a Linguistics approach to Creative Writing

LIM Yi-En, National Junior College, Singapore
Language and Literacy Education

Abstract

Secondary 1 students bring with them their baggage when they start the next phase of their lives. Among the many things they carry over from their primary school training is the “formula” they have been taught in their primary school English composition class. This might have been adequate for the purposes of the PSLE, but it is not creative writing. They are activating a formula and they are not being experimental and creative.
Yet, the students know no other way to write if they don’t activate their formula. In fact, they are trapped in this mould and cannot break out of it. This seems strange especially among students who are diagnosed to be proficient in the English Language. How can we move them away from stock phrases and clichés and recover the creativity in student writing? How can we re-establish the connection between the language within children and the piece that they have to write? How can we do more than just provide stimulus? How can we re-design our writing classes to tap on students’ English Language proficiency to create engaging, original pieces of writing?
One possible strategy is to help students make the leap between the screen and the page, to perceive how the writer’s pen is like the movie director’s camera in their re-creation of scenes and action. It makes them sensitive, confident, courageous risk-takers to depart from the familiar and to venture into the unknown. It draws on their knowledge of the structures of the English Language. It starts where PSLE stops.

Keyword: Curriculum & Pedagogical Innovation, Language and Education

Workshop- WOR045

Teaching of Oral Communication using Wayang Kulit (SHADOW PUPPETRY)

Rositah Yusof, Pei Hwa Secondary School, Singapore
Teacher Quality, Teacher Learning and Development

Abstract

Oral skills is one of the important component in the teaching and learning of the Malay Language. The challenge faced by Malay Language teachers is to develop students' interest in using the Malay Language fluently with confidence.

In line with the objective of developing effective communicators to be ready for the 21st Century, the teaching and learning package is introduced to engage students from the 3 express through their wayang kulit performance. The pedagogical approach is Experiential Learning. There are 4 steps in this Experiential Learning Cycle. Firstly is the Concrete Experience. Secondly, the Reflective Observation. Thirdly, is the Abstract Conceptualisation and fourthly is the Application. The lesson was conducted over 3 – 4 lessons during Term 1. ICT tools used are Answer Garden and Voice Thread. The tools used aids collaborative and self-directed learning.

The objectives of the lesson package are to enable students to improve their oral skills and stimulate their creative thinking skills. Thirdly is to instill the cultural aspect through performance in wayang kulit. Assessment is conducted through evaluating students' performance based on the rubrics by teachers and their peers.

At the end of the presentation, the participants will be able to:

1) Create an alternative ending to the storyline,
2) Perform the wayang kulit.
3) Understand the use of Experiential Education in lessons.

Participants will be experiencing a hands on session as below:

STEP 1: CONCRETE EXPERIENCE (2 mins)

Participants will be watching a video clip on wayang kulit in English Language

STEP 2: REFLECTIVE OBSERVATION/REFLECTION BASED ON OBSERVATION (10 mins)

Participants will be ask to reflect on what they have watch. They are to answer these questions during their reflection (using the mini whiteboards):

a) With a partner next to you, reflect on what you have watch.
b) What do you observe from the video clip about the wayang kulit characters?
c) How do you relate the video clip to your own personal experience?
d) Please share your thoughts about the video clip.

The presenter will summarise the reflection. Some of the examples of their reflections are (3 mins):

a) Experienced watching wayang kulit performance during MTFN

Keyword: 21st Century Competencies, Teacher Education/Development

Workshop- WOR053

Helping Students to be Better Learner through Mediated Learning Experience (MLE)

Josephine ONG, Peiying Primary School, Singapore
PHUA Siew Keng, Peiying Primary School, Singapore
Cognition, Motivation and Learning

Abstract

It is often challenging to help low progress students to achieve a breakthrough to become better learners. Teachers have often noted that such learners usually struggle with memory, focus and processing of information skills. Cognitive instruction through Mediated Learning Experience (MLE) can improve the cognitive performance of students and help them to remember better, be more focussed and systematic in processing information. Besides improvement in cognitive functions, students who are taught using MLE show impressive gains in their level of confidence and ability to express themselves and hence, became more responsive to teaching and learning.

This workshop will introduce the use of cognitive instruction using non-content based activities. This will help to widen the repertoire of intervention strategies of participants to meet the diverse needs of students. Participants will learn how to use MLE through an experiential presentation and hands-on activities that will equip them with ideas and strategies to develop the cognitive functions of students to help them become better learners.

In the light of neuroscience evidence of the neuroplasticity of the brain, it is hoped that this workshop will trigger participants to reflect, re-examine their roles and recognise that their charges are modifiable cognitively and they can become agents of modification to unlock the potential of their students.

Keyword: Cognitive Processes/Development, Motivation

Workshop- WOR071

Doubly Classified Model: Cross Classified Table for Assessment using Package R

Tan Teck Kiang, Institute for Adult Learning, Singapore
Mathematics Education

Abstract

In practice, it is common to have more than one appraiser to assess performance. This is to ensure fairness, consistency and reliability in assessment. In the education sector, the opinions of teachers on their student's performance may differ when there are two or more teachers carrying out their assessment on the same student. When these differences occur, we would like to know the degree and pattern of disagreement between teachers so that we can explain the differences. A cross tabulation on the categorical scoring of assessments between two teachers shows their similarity and dispersion in assessments. If two teachers are in total agreement, for a cross tabulation of n x n table where n is the number of categories of ratings, all the observations fall on the diagonal of the table. Disagreement appears when there are observations on the off-diagonal cells. These two pieces of information give us the percentages of agreement and dispersion, however too simplistic and does not tell us about the pattern of disagreement. A doubly classified model becomes handy to supplement them as it tells us the patterns of agreement and disagreement. The main aim of the workshop is to illustrate the usefulness of doubly classified models in identifying patterns of agreement/disagreement under a n x n assessment cross tabulation. The workshop starts with the simplest doubly classified model, the complete symmetry model, and proceeds to cover various doubly classified models such as point symmetry models, non-independent models, and asymmetry models. Numerous examples will be used to explain these models so as to illustrate the patterns of agreement. These models are modelled using package R function lm(), generalised linear model. For those who do not know much about package R, a brief introduction to R is given at the beginning of the workshop. A systematic way of examining patterns of assessment and modelling strategies are discussed. It is a practical workshop. So, bring along your notebook with package R installed to discover what doubly classified can do for you. The installation procedure can be found in the following web page:
http://cran.r-porject.org/

Keyword: Mathematics Education, Research Methodology

Workshop- WOR072

An Overview of Package R, What Can IT Do for Your research?

Tan Teck Kiang, Institute for Adult Learning, Singapore
Mathematics Education

Abstract

This workshop gives an overview of the freeware Package R, presenting schematically its functionalities, applications, scopes, and constraints. How the various packages in R can provide for analytical support in research will be illustrated during the session. R syntax will be distributed to the participants so that they can run and produce R output during the workshop session to appreciate the benefits of using package R for their research. Package R is free and can be easily downloaded and installed from the web page http://cran.r-porject.org/. Since its inception in the middle of the 1990s, it has quickly become a popular software for statistical analyses and research. The Comprehensive R Archive Network (CRAN) task view contains 34 task views. A task view is the grouping of R packages into subject areas. For instance, psychometrics and Social Sciences task views are most relevant for education research. These two task views cover packages in R that carry out social science and psychometric analytical analyses such as official statistics, linear and generalized linear models, analysis of categorical and count data, missing data analysis, item response theory and correspondence analysis. Multivariate and Graphics views are another two task views for multivariate analysis and graphics. Within each view, there are numerous packages grouped under each of them. Currently, there are 42, 84, 124 and 141 packages mentioned in CRAN graphic, social sciences, multivariate and psychometric task views respectively. As at 11 January 2017, there are 9,909 adds-on packages available at the CRAN.
The workshop will give what R can do for research by referring to a few specific adds-on packages that are relevant to education research. In particular, the excellent graphical capabilities of R will be illustrated with interesting graphs. The workshop also touches on a few packages from social sciences, multivariate and psychometric task views to bring out the powerful analytical tools of what R packages can provide. Many examples will be given during the workshop. Do come with your notebook with R installed and have an exciting and fun time to see what R can do for you and your research.

Keyword: Professional Development, Research Methodology

Workshop- WOR076

Once Upon a Time: An Introduction to Digital Storytelling

Phillip TOWNDROW, National Institute Of Education, Singapore
Galyna KOGUT, National Institute Of Education, Singapore
Language and Literacy Education

Abstract

From time immemorial, stories have been told and shared for various cultural, social and historical purposes. The use and telling of stories in education--particularly language arts--has a long tradition but the use of technology that enables students (either working individually or in groups) to combine text and other media into their narratives is a more recent curriculum innovation.

According to many professionals and advocates, digital technology is a powerful tool for story creation but how exactly can teachers and learners harness this potential in their regular lessons and for what purposes? These are important questions and we (as educators) need ways in which we can respond appropriately and creatively in order to keep our students engaged in their modern-day learning.

This introductory workshop begins by looking at the various types of digital stories that we can make and tell. What are the elements of digital story construction and how do they operate? As an example, participants will explore communication with and through images and then practice combining these with written and/or spoken words to make meanings along the lines of a particular theme or topic.

Keyword: Language and Education, Multiliteracies & Multimodalities

Workshop- WOR089

Exploring the Concept of Relationships in the Literature Classroom

Jan Lim, National Junior College, Singapore
Curriculum Development

Abstract

What kinds of conflicts do we face in our daily lives? How do our relationships with the people whom we are having conflicts with affect the conflict mediation/ resolution process? In this workshop, participants will be introduced to how the concepts of relationships, duty and responsibility and conflict and mediation are taught in a Literature classroom via a concept-based teaching approach.

Concept-based teaching, according to H. Lynn Erickson, focuses on concepts, facts and skills to gain deeper conceptual understanding of disciplinary content. In the Literature classroom, students use textual evidence from King Lear to support their interpretations of the relationships between characters and how these relationships will affect and influence how they resolve their conflicts. Students will take on the roles of different characters in King Lear and go through various conflict mediation processes, which will allow them to analyse a range of relationships.

Participants of this workshop will get to analyse the famous opening scene of King Lear, where King Lear administers his ‘love test’ to find out how much his daughters love him so that he can consequently give them what he thinks is an appropriate portion of his kingdom. Participants may engage in a dramatic reading of the scene, take on roles of characters in this scene and try to resolve the conflict that King Lear and his youngest daughter, Cordelia, are facing.

Through this hands-on exercise, participants will see how connections can be built between ‘new’ knowledge and prior knowledge about relationships. Additionally, participants will also experience thinking about the scene that they have read by using the conceptual lens of ‘relationships’, gain a deeper understanding of this concept by engaging with textual evidence and discussion as well as see connections between knowledge and skills at the conceptual level.

Keyword: Curriculum Design/Reform, Literature

Workshop- WOR098

Self-Directed Learning and Reflective Practices in Physical Education through Edmodo

SHEN Weixiong, Hong Wen School, Singapore
Anthony Ruben Aruldass, Hong Wen School, Singapore
Physical Education & Sports

Abstract

In Hong Wen School, Physical Education (PE) plays a key role in providing our students a holistic learning experience with opportunities to acquire the knowledge, skills, attitudes and values in life towards the pursuit of a lifelong, physically active and healthy lifestyle. In this presentation, we hope to develop each of our students into "a self-directed learner who takes responsibility for his own learning, who questions, reflects and perseveres in the pursuit of learning" through the use of ICT (MOE, 2009).

The objective is to illustrate how PE teachers can tap on Edmodo, a social learning platform, to promote self-directed learning and reflective practices amongst our students. Through Edmodo, we are able to enhance our PE lessons by incorporating questions, assignments and video analysis to allow our students to develop critical and creative thinking and become more reflective and responsible learners.

By using Edmodo, we seek to advocate three important aspects of self-directed learning entailing : (a) ownership of learning; (b) self-management and self-monitoring & (c) extension of learning.
The limited duration of PE periods and a relatively large class size of 30 to 40 pupils, pose challenges to our PE teachers who are facing the following concerns:

1. How can we develop 21st century skills amongst our pupils in the teaching of Physical Education through PE lessons?
2. How can we ensure pupils' understanding of the PE lessons within a limited time?
3. How can our pupils continue their learning beyond the classroom?

Hence, using Edmodo, allows our pupils to take ownership of their own learning and be self-directed learners. Edmodo provides the opportunity for them to reflect on their learning and use feedback from teachers and peers to improve their knowledge, movement skills and game concepts in physical education. It is also an effective and efficient avenue for teachers to monitor and assess pupils' understanding of their PE lessons.

In a practical hands-on session, we will show the functionalities and features of Edmodo for your classes.

Keyword: Information Technology and Education, Physical Education

Workshop- WOR102

The Use Of Blended Learning Model In Hànzì Teaching And Learning

GE YAN, Fuhua Primary School, Singapore
IT in Education

Abstract

Learning to read and write the Chinese characters (Hànzì) is particularly challenging for students because it consists of a thousands of complex characters, and each character represents both sound and meaning. To help them master Hànzì, our team of teachers have designed a blended-learning style of Hànzì learning package using a series of interactive video lessons for Primary 3 students. These interactive videos showcase 50 basic Hànzì selected from creditable corpus were uploaded onto online platform for students so that they can learn at their own pace. Findings showed that all the learners have made significant improvement in word recognition and writing of the Hànzì. Teachers also observed that students were also more motivated in Chinese learning.
In this workshop, participants will learn how these interactive video lessons were designed and how our team of teachers collaborated at the designing stage. Participants will also get to know how these lessons are implemented into daily teaching and how our teachers collect and analyse data from students' response after online lessons. We will also talk about how this blended-learning style lesson package has encouraged students to take ownership of their own learning and extend their learning beyond the classroom at young age.

Keyword: Curriculum Design/Reform, Information Technology and Education

Workshop- WOR107

Correcting climate change misconceptions through the use of refutation text

Frances Ess, Mayflower Secondary School, Singapore
Chew-Hung CHANG, National Institute Of Education, Singapore
Liberty Pascua, The University of Sydney , undefined
Humanities and Social Studies Education

Abstract

This workshop provides an opportunity for geography educators to examine the misconceptions that students encounter when they study the topic of climate change and the pedagogy that can be used to correct such misconceptions.
As students attempt to make sense of the environment especially with reference to climate change, they begin to form personal knowledge structures. These structures often include misconceptions like incomplete information or misinformation about climate change, the causes of climate change, the natural greenhouse effect and its properties and the enhancement of the greenhouse effect.
While most students may be unaware of their own misconceptions, some students are resistant to modify or change these misconceptions as it requires them to break down their existing knowledge structure. These misconceptions prevent students from developing meaningful understanding of concepts taught (Ozturk and Alkis 2010).
Since students obtain their main source of information from textbooks, text-based method is an effective method of clearing misconception.
This approach has been tried and tested (Chang, C.-H., Pascua, L. & Ess, F. (in press)) and this workshop will introduced the use of refutation text for the topic of climatic change. The approach will be introduced and explained with a view to show geographer educators how to incorporate refutation text as an instructional too to use in class. Participants will have the opportunity to work on activities based on authentic classroom artefacts to understand how refutation texts can be used to correct misconceptions about climate change in geography classroom.

Keyword: Classroom Research

Workshop- WOR113

Structured Writing Instruction and Writing Checklist aid Learners with Dyslexia in their Narrative Writing: A Case Study

Serena, Dyslexia Association of Singapore, Singapore
Rosalyn, Dyslexia Association of Singapore, Singapore
Nur Alia, Dyslexia Association of Singapore, Singapore
Special Needs Education

Abstract

The learners at the Dyslexia Association of Singapore (DAS) are taught writing based on the process-genre approach (Badger & White, 2000) to emphasise on linguistic skills and knowledge essential in writing. Additionally, an adaptation of the 6+1 Traits Writing (Northwest Regional Educational Laboratory, 2004) rubric was added to the writing instruction to create the platform for explicit feedback and to make writing more focused and meaningful for the learners.

Hence, a year-long case study was conducted to explore whether the use of a structured writing Instruction and a student-friendly checklist based on the 6+1 Traits Writing (Northwest Regional Education Laboratory, 2004) would lead to an improvement in dyslexic learners' narrative writing skills and their motivation. Four classes of students attending mainstreams, ages 10 to 12 years, with similar abilities have been identified to take part in the study for four terms and they were grouped to either be in an experimental or comparison group.

All of them have been diagnosed with Dyslexia with below average scores in their reading and spelling. In other words, the selected participants are not only weak in their basic literacy skills, they also struggle with advanced literacy skills such as Writing and Reading Comprehension.

A pre-test was conducted at the beginning of the school term, Term 1, a mid-year writing test in Term 2 as well as a post test at the end of Term 4 of 2016. An adaptation of the motivation surveys were administered in Term 1 and Term 4 of 2016. Writing was taught to the comparison group using only the structured writing instruction while writing was taught to the experimental group using both the structured writing instruction and student-friendly checklist.

Findings show that learners from both groups who were taught writing using the structured writing instruction had demonstrated improvements in their narrative writing achievements. Learners from the experimental group also displayed a higher sense of motivation. Therefore, we may conclude that the use of structured writing instruction and writing checklist to teach narrative writing have helped the dyslexic learners gradually develop the writing skills needed to be confident and effective writers.

Keyword: Curriculum in Classroom, Motivation

Workshop- WOR125

Unlocking the Value of Data to enhance students' performance

Rani Mano, Regent Secondary School, Singapore
Tan wei Jin, Regent Secondary School, Singapore
Educational Policies and Practices

Abstract

Research done by researchers such as (Datnow, Park &Wohlstetter, 2007) have linked data driven instructions to high achieving schools. The high achievement itself is a strong motivating factor for teachers to learn how to use the rich data so easily available in Singapore schools to enhance programmes and pedagogical strategies for enhanced performance.

The PRISM ,School Pic and tracking data through School Cockpit, Formative and Summative Assessments , markers reports provide rich data to evaluate programmes , set effective PIs (Performance Indicators) for departments, classes and school The workshop provides opportunities for participants to explore the various data and skilfully elicit valuable data information . Participants will learn how to contextualise these data for analysis and then transfer this to knowledge. With these knowledge they could craft strategies to motivate teachers and students and to create customised differentiated learning and revision packages for the different ability groups.

The importance of regular review of data to fine tune processes such as deployment and ability groupings would also be shared. Using tracking and correlation data to align internal exam papers to external standards and MYE and Preliminary exam scores to external examination grades so teachers and students are aware of current reality and the gap they need to overcome to achieve the targeted grade.
This valuable data also allows IP teams to customise their strategies to help students

The workshop will share how to extract the relevant prism data to determine the COP for streaming and strategic subject combinations for the schools in various bands. The need for variable COP based on % eligibility data extracted from prism would be explained.

The creation of Form A , Form N and Form NT from internal exam data would be explained and demonstrated . Schools who are interested to learn the technical skills of this creation can ask their repective VPs to drop an email to the VP of Regent Secondary School. This creation would enable students to see their Form A, N and NT at every Examination at their graduation level.

Keyword: 21st Century Competencies

Workshop- WOR135

Redesigning O level PE theory lessons to create an interactive learning environment

Louis Ho, Seng Kang Secondary School, Singapore
Joseph Soh, Seng Kang Secondary School, Singapore
Physical Education & Sports

Abstract

One of the key challenges for the teaching of O Level PE is to develop 21st Century competencies in our students, especially critical and inventive thinking skills. At Seng Kang Secondary School, to address the above mentioned challenges and looking at the profile of our student, the PE department decided to embark on an active learning pedagogy, which incorporated the use of formative assessment in the lessons.

To make learning a more joyful experience, scenario or problem based learning was adapted to make learning more relevant and current for our students. The teachers also incorporated the use of ICT in enabling the use of formative assessment during lessons. One of the ways to make lessons more student-centred is to transform lessons from using static powerpoint lessons to a more engaging and interactive learning experience. Nearpod is an ICT tool that supports student-centered learning and enables teachers to increase the students' engagement and participation in class. It enables teachers to collect more useful assessment data from students to measure progress toward learning goals and identify learning gaps.

The aim of this project is to examine the use of Nearpod in theory lessons for O Level PE and its impact on student learning outcomes. The introduction of engaging interactive features like drawings, quizzes and free text activities not only increases engagement but also provides valuable assessment data. It is also versatile enough to allow students to express their answers in many ways. As a result, the lessons generate engagement, uncover misconceptions, and spark conversation. The outcomes of the use of Nearpod to incorporate elements of formative assessment has been encouraging at both internal and national exams. In the recent O level results released in 2016, half the class in 4 Express scored a distinction for O level PE which is a significant improvement from previous years (usually around 10%-20%).

In this presentation, we will walk through examples of how lessons was transformed to create an interactive and engaging learning environment, the challenges and recommendations for the department's continual effort in developing 21st century skills in our students taking O level PE.

Keyword: Physical Education, Problem-based Learning

Workshop- WOR137

Towards best practices in physical education: Integrating ICT with Physical Education to promote motivational climate

Furhan Hassan, Fuhua Primary School, Singapore
Habib Nasiruddin, Fuhua Primary School, Singapore
Siti Sarah Aziz, Fuhua Primary School, Singapore
Thong Lok Leung, Fuhua Primary School, Singapore
Shawn Yeap, Fuhua Primary School, Singapore
Physical Education & Sports

Abstract

Towards best practices in physical education: Integrating ICT with Physical Education to promote motivational climate and create a self-directed learning environment with the use of Heart Rate monitors

As student obesity is an increasing trend, the PE department at Fuhua Primary School intends to use the Heart Rate sensors and monitoring software to establish the best training method to achieve a healthy weight and heart. According to Janssen and LeBlan, (2010), circuit training has been identified to provide multiple health benefits for children aged 5 to 17. Fuhua Primary has adopted Hop Sports ™ which is a US-based ICT training tool which simulates interactive circuit training suitable for children and adults of all ages. Due to the dynamic levels of difficulty, users get to choose the intensity of their workout to complement to their fitness goals. In this workshop, participants will learn about the approach whereby teachers design a series of lessons suited for learners appropriate at their age and fitness level. By integrating heart rate monitors and Hop Sports ™, Fuhua Primary PE Department aims to create a motivational climate in which students take ownership of their health and fitness.

Keyword: Physical Education

Workshop- WOR142

Use of Drama in Education to enable students to learn about Moral Reasoning in Character & Citizenship Education

Celia Loong, Regent Secondary School, Singapore
Neo Han Wei Candy, Regent Secondary School, Singapore
Civics and Moral Education

Abstract

Title: Use of Drama in Education to enable students to learn about Moral Reasoning in Character & Citizenship Education

School: Regent Secondary School (West 8 Cluster); Workshop 90 mins

Presenters: Mrs Celia Loong and Ms Candy Neo

Targeted Audience: All Teachers

In Regent, we endeavour to deliver every CCE lesson in a student-centric environment. Through the CCE lessons, we hope to provide opportunities for students to construct their understanding from their daily experiences, interact with peers of different abilities and to engage in experiential learning.

During lessons, apart from imparting the head knowledge on values education to our students, it is essential to put in place opportunities for students to demonstrate their learning and understanding of the concepts of Identity, Relationship and Choices

Drama-In-Education (D-I-E) provides a platform for the students to cultivate values by putting them in situations which enable them to put themselves in the shoes of others. In CCE-DIE teaching, teachers will be the facilitators who guide and engage the students through the lessons. Students will learn the CCE concepts through the experiential learning brought about by D-I-E. It emphasizes on the process, as students will be able to develop their sense of empathy through interaction with others during the CCE-DIE lessons and apply the values they have learnt in their daily lives. It provides opportunities for students to be exposed to various scenarios which allowed them to have different perspectives. As students have a chance to express their views and opinions, as a result, students' engagement is enhanced. The main drama conventions used for the project are Still Image, Small Group Play Making, Thought-tracking, Alter Ego and Spectrum of Differences.

The data collected are from interviews with teachers and students, reflection journals and the post-CCE DIE survey. Through the data collected, we will have a better understanding on whether the students are able to adapt to the new pedagogy and learn better. As for the teachers, we will review the lesson plans based on the feedback given by them and customise the lesson plans to suit the needs of the teachers.

Keyword: Curriculum & Pedagogical Innovation

Workshop- WOR146

Building a Writing Culture

Sarah Ong, Corporation Primary School, Singapore
Maybelline Teo, Corporation Primary School, Singapore
Language and Literacy Education

Abstract

Based on Barbara Kato's paper and Kelly Gallagher's work, writing is seen as a process and this is very much aligned to what happens in the teaching of English Language in Primary School, with the Strategies for English Language Learning and Reading (STELLAR). Current strategies used include Modified Language Experience Approach (MLEA) and Writing Process Cycle (WPC), students are exposed to common experiences for them to write about. With the understanding that writing comes from within and that each student has a unique experience to write about, the session aims to provide a perspective of how a writing culture can be improved.
Making use of simple and short writing activities and understanding the rationale behind these activities, teachers will have a different perspective of how to get Primary School pupils interested and engaged in the writing process. The teacher is also engaged in becoming a model for students to learn from.
At the end of the session, teachers would have gone through a hands-on session of how a writing lesson can be structured. They will also be able to bring back simple ways of getting pupils to respond to a text to build their own writing culture in the classroom.

Keyword: Curriculum Design/Reform, Curriculum in Classroom

Workshop- WOR152

Adapting and Standardizing the Ages & Stages Questionnaires and the Ages & Stages Questionnaires: Social-Emotional

Xie Huichao, National Institute Of Education, Singapore
Early Childhood Education

Abstract

Lack of valid and reliable instruments for identifying social and emotional delays in young children is a worldwide issue. The Ages & Stages Questionnaire, Third Edition and Ages & Stages Questionnaire: Social-Emotional, developed in English in the United States, were translated and adapted to provide developmental screening tools in Chinese.Following the guidelines of the International Test Commission (ITC), the ASQ-3 and ASQ:SE were translated into Simplified Chinese ASQ-C and ASQ:SE-C. Normative samples were collected on 4,452 (for ASQ-C) and 2,528 (for ASQ:SE-C) Chinese children to generate new cut-off scores. Meanwhile, psychometric properties were examined and results indicated evidence to support the reliability and validity of these two new tools. For the ASQ-C, Cronbach's alpha coefficients ranged from .51 to .68 ($p < .01$), indicating adequate internal consistency in some age intervals; Pearson correlation coefficient between two raters was .82 ($p < .01$), indicating sufficient inter-rater reliability; using the Beijing Gesell Developmental Scale (Beijing Institute of Child Psychology, 1992) as the concurrent measure, the sensitivity of the ASQ-C was 88% and specificity was 84%, suggesting good concurrent validity. Results of a six-item parent survey showed that a majority (over 90%) of parents found that the ASQ-C items were easy to understand, engaging to their children and represented critical skills of their child's age. For the ASQ:SE-C, Cronbach's alpha coefficients ranged from .56 to .77, suggesting good internal consistency in some age intervals; inter-rater reliability was.79 ($p < .01$). There is no "gold standard" in measuring social-emotional developing on young children. Using four measures targeting temperament, social-emotional development and behavioral disorders as convergent measures, the classification results (i.e., whether a child is typically developing or at risk for social-emotional problems) of the ASQ:SE-C showed an overall agreement of 63% to 79% with the four measures. In this workshop, the two newly adapted measures, as well as findings from the standardization and psychometric studies will be presented. Implications for early childhood researchers and practitioners will be discussed.

Keyword: Assessment, Early Childhood

Workshop- WOR171

Developing Primary School Pupils in Understanding Scientific Variables

Nelson Tong, Frontier Primary School, Singapore
Science Education

Abstract

In the learning of Science, pupils need a set of skills and be well versed in the process to inquire the phenomena around them. Skills such as observing, using apparatus and instruments and equipment, comparing, classifying, inferring, analyzing and evaluating are best learnt through experimental set-ups. However, for the pupils to understand experimental set-ups well, they need to understand scientific variables.
Teachers in primary school face a difficult task in explaining scientific variables such as independent, dependent, controlled variables or fair test to the pupils with the lack of resources that explicitly teach the concept.
This Professional Learning Community (PLC) lesson study project examines how scientific methods can be packaged to teach scientific variables. A Variables Package was designed to incorporate objects that will enable pupils with little or no prior knowledge of Science to relate to the process skills more easily.
The project was adopted to gain and understand a statistical and affective overview of the participants involved, and evaluate the extent to which the intervention has been successful in improving the analytical ability of pupils in answering questions relating to the scientific variables. The researchers surveyed opinions, views and perceptions of teacher and pupil participants, and the outcomes of the intervention on pupils were measured using pre and post-tests. The affective aspect involved gathering opinions and perceptions of teachers and pupils, including their own experiences with learning that were captured in a reflection section of the package. Quantitative data was compiled by comparing pupils' scores in answering the scientific questions posted in the pre and post-tests.
The research team concluded that the package improved pupils' scores in the post-test and enhanced some of their confidence and capacity to handle scientific experimental questions. They can identify independent, dependent, controlled variables in an experimental set-up and also the conditions needed in a fair test.

Keyword: Collaboration/Collaborative Learning, Curriculum & Pedagogical Innovation

Workshop- WOR174

“”Looking Back” at Polya’s Fourth Phase of Mathematical Problem Solving – a mathematical problem solving case study"

Jason Charles INGHAM, School Of Science And Technology, Singapore
Mathematics Education

Abstract

Problem solving has been central to the mathematics education scene from as early as 1989. However, problem solving research and application have primarily been the exclusive domain of olympiad training programs and the infusion into the regular classroom and mathematics teachers' professional development programs have not been widely successful. In this study, we tract the pedagogical development of three teachers who have infused Polya's 4 Phases into their regular lessons and we track how this initiative have helped them to craft lesson materials and diagnostic tools in their attempt to differentiate their students' learning experience. Infusing real world problems into the classroom, we track the cognitive development of the students and how this program has affected the perspective of the participating teachers.

Keyword: Curriculum & Pedagogical Innovation, Curriculum Design/Reform

Workshop- WOR178

Applied Learning: The SST Way

Nur Johari Salleh, School Of Science And Technology, Singapore
Yeo Chuen Chuen, School Of Science And Technology, Singapore
Mathematics Education

Abstract

Alternative assessment is an integral part of Mathematics formative assessment in School of Science and Technology, Singapore, other than traditional pen-and-paper, short answer tests. It is an authentic and Applied Mathematics settings viz a viz project work and gives a holistic picture of a student's capabilities, interest and highlight his/her appreciation and understanding of Mathematics. It gives the student opportunity to demonstrate the depth and scope of learning without being limited to typical questions or make-or-break tests with the primary focus on Mathematics learning and appreciation. There is also ample opportunities to uncover the applicability of Mathematics in the real-world.

The projects we are presenting showcase the interdisciplinary and applied learning pedagogical approach for Secondary Two students. These allow students to be Creative, Innovative, make meaning and Value of their understanding and solutions. We define the interdisciplinary tasks from the UbD framework (Wiggins and McTighe, 1998) and present a real-world problem within the context of a community. It allows the students to see mathematics through a different conceptual lens. The project which took place over a span of 4 - 5 months, first allowed students to propose their own research questions pertaining to the real-world issue presented. The students then consolidate their preliminary research of the subject matter, proposed solution for part of the full problem. Through skillful scaffolding and increasing the difficulty of the task incrementally, students progressed and dwelved into deep research on selected question/ area, and thereafter proposed an extensive solution for the whole problem.

In one case, students were to design a lighting system for a hospice. This required students to approach the problem from both Mathematics and Physics. In the other case, students were invited to review the SST Open House concept, requiring them to study the issue from Mathematics and ADMT (Art, Design, Media and Technology). The students took away many learning points and extended their learning into areas beyond the national curriculum. This group of students also had the opportunity to act as marketing and branding agents and presented their proposals to the SST Corporate Communications Department in 2016.

Keyword: Curriculum & Pedagogical Innovation, Mathematics Education

Workshop- WOR179

#JoyofLearning through Context Based Learning

Anna Koh, Academy of Singapore Teachers, Singapore
Gnanamany Yacob, Academy of Singapore Teachers, Singapore
Muhammad Nazir, Academy of Singapore Teachers, Singapore
Irene Tan, Academy of Singapore Teachers, Singapore
Science Education

Abstract

Research has shown that creating a brain-friendly (amygdala-friendly) environment that is positive, joyful and purposeful leads to enhanced learning (Willis, 2010). A way to create such environments is to design activities that appeal to students, and present them in ways that are authentic and pivoted on concrete real-world situations. Doing this emotionally connects students to the subject content, which in turn makes learning meaningful.
In this session, Master Teachers will guide participants through a Context-Based Learning (CBL) pedagogical approach that is amygdala-friendly in highlighting how academic concepts and skills across the lower secondary sciences and Food and Consumer Education (FCE) can be presented. It engages students in meaningful exploration and inquiry within teacher-designed contexts or situations. Participants attending this session will engage in fun hands-on activities such as making gummy bears, cotton candy and marshmallows which would offer opportunities for them to increase their repertoire of teaching strategies and deepen their Pedagogical Content Knowledge (PCK). A discussion on how such activities promote the joy of learning and engagement will be carried out at the end of the session.

Keyword: Learning Environments, Science Education

Workshop- WOR183

Managing discussion in reading comprehension lessons: Teacher 'moves'

Rita Elaine Silver, National Institute Of Education, Singapore
Jessie Png, National Institute Of Education, Singapore
SingTeach Special Workshop

Abstract

This workshop focuses on strategies and techniques that teachers can use to enhance students' reading comprehension and skills through discussion. Crucially, the teacher must facilitate student comprehension, keep the class on track, and 'move' the conversation forward. A set of discussion moves laid out by Beck & McKeown (2006) as part of Questioning the Author (a reading comprehension instructional strategy) is used as our starting point. We present 6 main discussion moves, discuss their functions and illustrate how they can be used in reading comprehension discussions. Examples from lessons in a local primary school are provided.

Because the moves require teachers to not only know what they are, but also how to use them for teaching, we engage workshop participants in scenarios to practise the moves during discussion. Finally, we give the participants an opportunity to discuss and reflect on the different ways in which moves might focus learner attention, how this might impact reading comprehension, and how they might implement or adapt the moves to their own lessons.

Keyword: Classroom Research, Teacher Education/Development

Workshop- WOR186

Lesson Study on crafting dialogue for effective characterization through peer assessment (rubrics), supported by ICT

Jiang Bei, St. Anthony's Canossian Secondary School, Singapore
Gu Yuan Yuan, St. Anthony's Canossian Secondary School, Singapore
Tay Hui Cheng, St. Anthony's Canossian Secondary School, Singapore
Assessment

Abstract

Objective:
Using dialogue for effective characterization is one of the key skills in the 2011 Secondary Chinese Language syllabus that students have to acquire in Secondary Two. While the students are able to identify this technique in the text, they are unable to apply this skill effectively in their written work.

Methodology:
The whole CL Department thus embarked on a Lesson Study to address this. To facilitate effective peer assessment, we designed a rubric that is easy to use while capturing the salient components for effective dialogue writing. Students' prior knowledge is activated as examples Sec 1 & 2 Chinese textbooks were incorporated in our teaching material. While we were certain that we are going to use Group/Peer Assessment as a platform to check for the student's understanding and mastery of the technique, we were divided in our views in its method of execution (Plan A Vs Plan B). As such, prior to the Research lesson, the other Sec 2E teachers used the lesson plan to do trial teaching and experiment on different ways to conduct the lesson. These experiments gave our final research teachers a better idea for lesson refinements, paving the way to a successful open lesson study in 2016. In the final open lesson study which is opened to 22 Chinese teachers from 15 other Secondary schools, we managed to weave in formative assessment (self-assessment, peer/group assessment) using a simple rubrics for effective characterization through dialogue, supported by ICT [using Google Sheets & Chromebooks]

Impact:
We received positive feedback from the participants and also affirmation from Senior Curriculum Resource Development Officer Ms. Li Dongmei and Master Principal Teacher Mdm. Lim Kwee Hwa during the open lesson study. The Sec 2E Chinese students' application of this technique is evidential from their subsequent essays writing as well as their Paper 1 in end of year examination.

Keyword: Assessment, Cooperative Learning

Workshop- WOR192

Team Based Learning@Spectra Secondary

Christopher Chee, Spectra Secondary School, Singapore
Lee Lye Peng, Spectra Secondary School, Singapore
SingTeach Special Workshop

Abstract

Team Based Learning (TBL) takes its roots from Higher Institutes of Learning, and has been successfully implemented in Duke-NUS and now other faculties in NUS, NTU, Polytechnics and Junior Colleges are also implementing the process. At Spectra Secondary where our students are only from the Normal Technical (NT) stream, we are the first such school to adapt the process in the learning of Mathematics. The primary learning objective in TBL is to go beyond simply covering content and focus on ensuring that students have the opportunity to practice
using course concepts to solve problems. Thus, TBL is designed to provide students with both conceptual and procedural knowledge. Productive Failure (PF) is about giving students a chance to apply concepts that have not been taught to them to solve problems.
We have integrated the PF idea within the TBL framework, to help low progress learners be self-directed yet work collaboratively to solve problems and transform them be more confident learners. We designed viewing guides whereby students learn the content via on-line sites such as Khan Academy and more recently developing our own on-line content via Brainscape, so that the time spent in class is devoted to developing relationships via peer and team learning. We observed that students felt empowered to take charge of their learning even beyond what was required of them, especially when given the opportunity to share and teach their fellow classmates. The Readiness Assurance Process (RAP), which is a component of TBL, uses an IF-AT (Immediate Feedback Assessment technique) card to encourage students to work as a team to solve problems. Participants will experience the RAP, receive resources developed by the workshop leader and be empowered to try out the process with their students in any level and in any discipline. Participants will experience the RAP, receive resources developed by the workshop leader and be empowered to try out the process with their students in any level and in any discipline.

Keyword: Collaboration/Collaborative Learning, Curriculum & Pedagogical Innovation

Workshop- WOR205

Character Education Through Intellectual Discourse - CareIn

G Sathya Prasad, Greenwood Primary School, Singapore
Noraini Bte Nanyan, Greenwood Primary School, Singapore
Soo Lihong, Greenwood Primary School, Singapore
Victor Lucas, Greenwood Primary School, Singapore
Goh Mei Chen, Greenwood Primary School, Singapore
Civics and Moral Education

Abstract

In the ever changing global landscape, the ability to understand complex issues and make sound decisions is critical. In such a context, a person's character will serve as a foundation for success. Greenwood Primary School has designed a school-based curriculum, CareIn, for values in education. This curriculum aims to provide pupils with an opportunity to develop their own moral compass which will aid them in decision making. At the same time, the school wanted to instil positive citizenship attributes in pupils.

The school designed a 30-week curriculum, CareIn, for each level. This curriculum is centred on the school values and relates to the Ministry of Education's Desired Outcomes of Education and the Character Values. To instil citizenship attributes in pupils, the school used News-In-Class, which allows the school to heighten pupils' awareness of current affairs issues pertaining to Singapore.

Pedagogies such as Appreciative Inquiry, Four Player Model and Systems Thinking are used to engage pupils to think through and discourse on the issues presented. The discussion during the CareIn lessons deepens the pupils' understanding of the issues facing Singapore and enables them to explore viable solutions using different perspectives. This in turn helps the pupils derive a greater appreciation of the school values and build citizenry in them.

To assess pupils' progress, the school has designed a character assessment tool that measures their progress in the area of character and citizenship. Pupils do a self-assessment with teacher providing their input. Parents are also engaged to provide feedback on pupils in these areas. This aids in their development.
The CareIn curriculum was awarded the Innovation Quality Circle Silver Award by SPRING Singapore in 2016 and the curriculum has also been adopted by schools in its cluster. Since the CareIn curriculum was introduced in 2014, there has been an improvement in the percentage of pupils getting Excellent or Very Good for their conduct. The School Climate Survey and Quality School Experience have also shown that teachers' and pupils' perception of discipline has improved.

Keyword: 21st Century Competencies, Citizenship Education

Workshop- WOR216

Translating Reflective Learning Theories into Classroom Practices in School Science

Tan Kok Siang, National Institute Of Education, Singapore
Edmund Tan Yong Boon , National Institute Of Education, Singapore
Science Education

Abstract

Confucius advocated that “we may learn wisdom by reflection” and Dewey mentioned that “we do not learn from experience but from reflecting on experience.” Thus, by being developed as a reflective learner a child may become a warm-hearted and clear-minded global citizen. The Desired Outcomes of the Singapore Education System indicate the need for students to graduate as confident and self-directed learners who can positively contribute to society with a passionate concern for the well-being of fellow citizens and the environment. Thus, students need to be keen observers in life, be able to generate possibilities and alternatives when faced with challenges, and be able to relate these to creating a better life for all. These thinking skills of “observing, generating and relating” also form the bedrock that supports the various reflective learning theories.

The workshop aims to engage participants in experiencing how the thinking skills of “observing, generating and relating” can be applied to learning school science reflectively. The learning theories discussed include Donald Schön’s “Reflection-on-action” and “Reflection-in-action” (1987), David Kolb’s Experiential Learning Theory (1999), and Jay McTighe’s reflective approach to 21st Century Learning and Assessment involving the learning skills of “Finding, Critically Appraising and Meaningfully Using information” (2010). These theories and approaches will be demonstrated through integrative learning and formative assessment activities and the use of school science learning and assessment materials. The workshop has three parts. Part I is a review of the reflective learning literature, including theories and research findings used in the activities. In Part II, participants will be led through small group activities and discussions involving case studies, short experimental and assessment-related tasks that are related to one or more reflective learning theories and research. Part III will be an interactive discussion on the participants’ workshop learning experiences. Participating upper primary and secondary school science teachers will find these reflective learning pedagogies and assessment strategies effective and practical for implementation in their daily science lessons.

Keyword: Metacognition, Science Education

Workshop- WOR223

Promoting Mathematical Reasoning and Flexible Problem Solving Through "Contrasting Examples"

Lee Sheau Huey, NUS High School Of Mathematics & Science, Singapore
YH See, National Junior College, Singapore
Prashant JAYAPRAGAS, Ministry of Education, Singapore
Mathematics Education

Abstract

"Even fairly good students, when they have obtained the solution of the problem, shut their books and look for something else. Doing so, they miss an important and instructive phase of the work."— Polya

This view that problem-solving is about following rules and procedures is implicit in mathematics education. While it transmits fixed messages that mathematics is a hierarchical discipline, students should be provided opportunities to explore and talk about mathematical ideas. When teachers do this, they teach mathematics as a learning subject instead of a performance subject. Moreover, when teachers pose questions that have multiple solutions or perspectives, it encourages for broader, engaging thought.

As part of our efforts to promote reasoning, a group of educators designed and implemented "Contrasting Examples" (CE) to support algebra and geometry instruction. CE comprises a rich problem, where two contrasting solution methods are presented as a pair. A key underlying characteristic of CE is the selective attention of the learner to the critical features in the solutions. By noticing and comparing these features, students discuss the affordances of these methods to make more informed decisions about problem-solving. The CE task-design includes three scaffold prompts, namely Understanding, Comparing, and Making Connections and teachers facilitate the discourse by drawing connections between concepts and procedures.

Generally, it is a struggle for novices to make sense of what information is important and how to use that information. However, when the contrasting methods were presented as a pair, the abstraction of the underlying structures became significantly noticeable. Noticing was imperative in a student's learning process, especially for struggling learners. CE were also a critical pathway to transferable knowledge as students engaged in deep social generation of knowledge. The teacher leveraged on student talk to address misconceptions and key ideas, enabling students to transfer what they know about one problem to flexibly solve non-routine ones.

This workshop adopts Thaler Pekar's "Heart-Head-Hand" approach. Participants will first be taken through the motivation and learning science behind CE. Through hands-on discussion of CE samples and student artefacts, participants will be engaged as designers of innovative instructional practices for a 21st century learner.

Keyword: Critical and Creative Thinking, Curriculum & Pedagogical Innovation

Workshop- WOR224

Developing 'Future Thinking' Skills in Schools

Jarett Kan, Anglo-Chinese School (Independent), Singapore
Liu Guoyi, Anglo-Chinese School (Independent), Singapore
Tan Kok Choon, Anglo-Chinese School (Independent), Singapore
Humanities and Social Studies Education

Abstract

Scenario planning was first used by Shell in 1972 as a method to anticipate global and local economic, social and political changes and how these could affect their business. The Singapore government began its future planning efforts as an experiment in the Ministry of Defence in the late 1980s and the use of Future Works in the public service has grown with the establishment of the Strategic Policy Office, Centre for Strategic Futures and the RAHS (Risk Assessment & Horizon Scanning) Programme Office.

Since 2011, Anglo-Chinese School (Independent) has been partnering with the RAHS Programme Office, Prime Minister's Office, to organize the annual Dr Goh Keng Swee Nation Building Series – Future Thinking Challenge for schools in Singapore. Part of the challenge consists of a Future Thinking Workshop whereby students will learn future thinking skills to develop future scenarios for Singapore. From an educator's perspective, the benefits of getting students to use future thinking skills are tremendous as it develops 21st Century Competencies such as civic literacy, global awareness, critical and inventive thinking, communication, collaboration and information skills. In this workshop, participants will be exposed to the scenario planning steps and strategies used to support future thinking. In addition, participants will consider how future thinking skills might be applied to Social Studies, General Paper and Character Citizenship Education (CCE) lessons.

Keyword: 21st Century Competencies, Critical and Creative Thinking

Workshop- WOR232

Playing Music with "Musical Direction": Performance Pedagogy from Music Analysis Perspective

Martin Lee, Caritas Institute of Higher Education, Hong Kong
Visual and Performing Arts

Abstract

Can you play that passage with more musical direction? This is usually what music students would receive from their teachers during applied-music lessons. If students know how to play, they definitely will not pretend not knowing but play the passage expressively with appropriate musical directions. How do the students know what to play in addition to the correct duration and pitch of the musical notes from the passage? In other words, what parameters should be considered when they play the passage to achieve better musical directions?

Teaching "musical direction" is an abstract notion in performance pedagogy. Some teachers ask students to think singing and anticipate such singing with their instruments. Some simply tell students to feel the phrase and play such feeling out from intuition. However, there seems no concrete way to tackle this issue, which makes performance pedagogy become more challenging, especially for both average teachers and students. Nevertheless, music analysis is regarded as having a close relationship with performance because both pursue the art of interpretation.

Based on selected violin repertoires and a real-time violin demonstration, this workshop serves as an illustration of how music analysis helps deeper reading and understanding the music. With respect to the recent publication of Music Theory Online discussing musical performance and music analysis, the first part of the workshop presents the theoretical framework explaining the close relationship between performance and music analysis. Illustrated with musical examples from the selected violin repertoires, the author continues to reveal what parameters a teacher or a student should look at and, through a real-time violin demonstration, how a performer should tackle a piece of music. Taking into account from the small unit of explicit melodic contour, cadence, to the large section of inherent counterpoint, functional harmonic progression and formal structure, when teachers and students know more what the musical nature is, they would be able to understand how the multi-faceted dimensions the music can be, they can then choose their best way to deliver it through their hands and instruments. Hence, a fruitful creativity in performance pedagogy and constructive communications between performers and audiences are achieved.

Keyword: Arts & Music Education, Curriculum & Pedagogical Innovation

Workshop- WOR239

Evaluation of Assessment Tasks and Students' Works in General Music Programme (GMP) in Singaporean Schools

Leong Wei Shin, National Institute Of Education, Singapore
Visual and Performing Arts

Abstract

This workshop presents findings from an 18-months research study on evaluation of music assessment tasks, lesson plans and students' music works from Singaporean General Music Programme (GMP) classrooms. This is the first large-scale evaluation study of GMP assessment tasks, lesson plans and students' works by a group of 15 expert teacher-evaluators within Singaporean primary and secondary school contexts. The workshop will discuss the quantitative findings on the results of the overall evaluation. Case studies and artefacts of of what we consider different extent of 'developmentally appropriate assessment tasks and standards of musical learning' will be used for group discussions. Such a workshop experience will hope to communicate this message: regular evaluation of student works and assessment tasks across schools is an important ongoing professional development that supports what music teachers (who are typically working alone in a school) are or need to be doing in their music classrooms on a daily basis.

Keyword: Arts & Music Education, Assessment

Workshop- WOR270

Enhance the Learning of Vocabulary in Primary Three Students through the Use of Taboo.

Rehana Shaik, Elias Park Primary School, Singapore
Language and Literacy Education

Abstract

In the STELLAR pedagogical framework, students learn targeted vocabulary through direct instruction. Vocabulary learning in school has been limited to the theme of selected storybooks. Students rely on teachers for new words and meanings as they learn vocabulary passively with little motivation and understanding. Huyen, N. T., & Nga, K. T. (2003), mentioned students may recognize a word in a written or spoken form but this does not show that they are able to use the word in context.

We would like to examine the effectiveness of using Taboo, a word guessing collaborative game, to improve students' ability to use appropriate words in context in a Primary Three classroom. Taboo, a commercial brand game was chosen for its availability of words and game features – competitive and communicative. We believe that language acquisition involves social interaction where people get to communicate and exchange ideas with each other. Dalton, E., (2005) mentioned that games encourage social skills, support motivation, and can be easily customised to suit the learning needs of students.

The Taboo game was carried out for all five Primary 3 classes with the main objective to guess the words correctly with only clues from their team members within the given duration. To monitor our students' ability to use words in context, we conducted pre and post-tests. We interviewed some of the students and teachers to find out how they feel about the game and to understand what characteristics of the game have helped students in their language acquisition. Students expressed that vocabulary lessons are more fun now as they get to interact with their peers and teachers agreed that students could to retain words better after playing the game. This encourages our team to move forward to improvise the game with enhanced features such as including useful words for writing, assigning points based on the difficulty of the words and integrating spelling as part of the vocabulary game.

Keyword: Classroom Research, Collaboration/Collaborative Learning

Workshop- WOR295

Strengthening Positive Teacher-Student Relationships (TSR) through School-Wide Approaches

Ms Ong Soo Lin, Ministry of Education, Singapore
Teacher Quality, Teacher Learning and Development

Abstract

Transactional Analysis, Positive Education and Restorative Practices are approaches that can help to equip teachers with competencies for TSR and influence the school culture positively. These approaches:

- Activate teachers' positive regard for their students
- Help teachers understand students better
- Provide applicable tools for teachers to build TSR

This workshop aims to provide a platform for teachers and schools to consider how they can strengthen positive TSR through the use of school-wide approaches - Transactional Analysis, Positive Education and Restorative Practices - thus building a supportive network of positive relationships in schools. This session will include sharing by 3 schools on how the approaches have affected both staff and students in the way they relate and interact with each other (TSR) and how that influence the school culture of care positively.

At the end of the presentation, participants will be able to

1. Learn how schools select an approach, and understand the factors that promote and impede school implementation of Transactional Analysis, Positive Education and Restorative Practices.
2. Learn strategies under each approach for strengthening positive TSR with students

This session will be co-presented by GB Senior Specialists and 3 schools. GB will provide the introduction and frame for the presentation giving an overview of building a caring community in schools focusing on positive TSR. This will be followed by schools' facilitation to help participants have a "taste"of/experience the approach, highlighting how each approach has strengthened TSR and build school culture of care in their respective schools. GB will close the session with a summary of common key factors for effective school implementation of the approaches, followed by a short Q&A and reflection.

Keyword: School/Teacher Effectiveness, Teacher Education/Development

Workshop- WOR301

Hands-On Pedagogies for Teaching Computational Thinking Skills

Prof Looi Chee Kit, National Institute Of Education, Singapore
Peter Seow, National Institute Of Education, Singapore
Dr Bimlesh Wadhwa, National University Of Singapore, Singapore
Dr Wu Longkai, National Institute Of Education, Singapore
Learning Sciences

Abstract

We have put together proposals for a symposium and for two workshops all related to computing education. If accepted, we request for a special strand/track on Computing Education on one of the days (say 2nd day) to put these events together back-to-back.

The Ministry of Education and IMDA have introduced computing to Primary and Lower Secondary students through the “Code for Fun” enrichment classes where students learn to program in Scratch. The computing subject is offered in some schools. Over the years and in various places round the world, pedagogical models have emerged that focus on identifying core computational thinking concepts and capabilities, and provide concrete exemplar learning activities. More specifically, teaching computing unplugged (without the use of computers) has gained momentum in countries such as New Zealand and United Kingdom where teachers and students learn computing concepts through fun kinesthetic approaches. Whilst students may be engaged through fun kinesthetic activities, the challenge for teachers is to facilitate these activities that would help students develop computational thinking skills and connect to computing concepts.

This workshop will introduce the following activities to participants:
1. How to teach programming? In this segment of the workshop, we will share different approaches of how schools are introducing and teaching the use of Python in the first year of implementing the new computing curriculum. The purpose of the workshop is to generate conversations about how teachers can introduce students to learning a programming language and apply Computational Thinking skills.
2. How to conduct some unplugged activities for teaching computing concepts? The aim of unplugged activities is to enthuse students in learning and understanding computing concepts through kinesthetic activities without the use of computers.
3. How to use Physical Computing in lessons? Building such interactive systems provide students opportunities to think and learn about the physical environment and using computing to interact with the environment and humans. Participants will learn to use the MicroBit board with sensors as input, program the board to process the input information, and use different forms of output to communicate to people.

A computer lab venue is required for this workshop.

Keyword: Critical and Creative Thinking, Curriculum & Pedagogical Innovation

Workshop- WOR305

How Computational Thinking and Design Thinking Skills taught by teachers are manifested in students' work?

Prof Looi Chee Kit, National Institute Of Education, Singapore
Dr Bimlesh Wadhwa, National University Of Singapore, Singapore
Peter Seow, National Institute Of Education, Singapore
Dr Wu Longkai, National Institute Of Education, Singapore
Learning Sciences

Abstract

We have put together proposals for a symposium and for two workshops all related to computing education. We request for a special strand/track on Computing Education.

Problem solving in the information-age combines two essential key thinking skills: Computational Thinking (CT) and Design Thinking (DT). CT is the process of expressing solutions so that humans and computers can understand them. Design thinking is the ability to understand problems and to develop creative solutions. While CT presents a proposition that school students should learn about logic, troubleshooting, procedural approaches to problems, and programming, DT helps students and teachers break out of the teach/test model and emphasizes what kids can "do". We believe that CT and DT could serve as a powerful framework for equipping our students with creative problem solving in this information-age.

In this workshop, teachers from Singapore schools will be invited to share the pedagogies and initiatives they have adopted in design and computing education, or/and exhibit the computing work and artifacts of their students, and discuss the learning pathways of these students in terms of the CT and DT skills that the students have manifested. Teachers will be encouraged to invite students from their schools to explain the exhibits.

The format of workshop will be as follows:
(i) Brief talks by each of the presenters (invited teachers to share their work). Each talk, of 2-3 minutes, will have a presenter highlight his/her work to the workshop audience.
(ii) Exhibits and/or posters or interactive stations by the teachers. This would allow participants to browse through various works and interact with the presenters. A total of up to 10 interactive presentations/posters is envisaged.
(iii) A sharing session by invited speakers from organizations like Science Centre, OneMakerGroup, IMDA, Google, Microsoft, and GovTech who have actively invested or have an interest in computing education in Singapore, to provide their perspectives.

We believe, this workshop will give participants a good feel of the range of pedagogies, innovations and practices in computing education in Singapore schools.

A room of about 50-80 seating capacity with general projector/PC for the presenters and invited speakers is required.

Keyword: Critical and Creative Thinking, Curriculum & Pedagogical Innovation

Workshop- WOR316

What More To Do About Thinking: Creative Applications of the Paulian Model of Critical Thinking

LEE SIONG BOON, St. Margaret's Secondary School, Singapore
ANDREA GOH BOON SI, St. Margaret's Secondary School, Singapore
Curriculum Development

Abstract

Richard Paul's model of critical thinking is a well-known tool for cognitive development and problem analysis. Its applications in various disciplines are wide and far-ranging. The objectives of this workshop are (a) to present St Margaret's Secondary School's unique experience in applying the Paulian model of critical thinking in curriculum design, and (b) to present an innovative way to use Paul's Elements of Thoughts in analysing solutions [as opposed to problem analysis].

These are just two of the innovative ways in which Paul's Elements of Thoughts are used to enhance the experience of classroom lessons. The school adopts a dual-approach in the use and application of Paulian's model of critical thinking. Besides the explicit teaching of the Elements of Thought in different subject areas, these Elements of Thoughts are also used in an implicit manner to help teachers design lessons that reveal the inter-relationships between those Elements.

At the end of this workshop, participants will be able to:
- Learn and understand how the relationships between the Elements of Thoughts can be used to design curriculum units in various disciplines such as history and science.
- Learn how to construct a matrix to apply the Paulian model of critical thinking to solution analysis.

Keyword: Critical and Creative Thinking, Curriculum Design/Reform

Workshop- WOR349

Using Article Structure Approach to Deepen the Text Teaching and Improve Reading & Comprehension Skills

Chen Meiqing, Chij Our Lady Queen Of Peace, Singapore
Chen I Chun, Chij Our Lady Queen Of Peace, Singapore
Yang Hui, Chij Our Lady Queen Of Peace, Singapore
Language and Literacy Education

Abstract

With the progression of pupils transiting into the upper primary level, the demands for acquiring comprehension skills increases and remains challenging for many students. Due to this, many students have developed a fear for comprehension. Therefore, improving students' reading and comprehension skills through innovative and effective teaching strategies are the teachers' top priority.

As a Lead Teacher, I led my colleagues to use the Article Structure approach in the classroom to improve the students' reading comprehension skills and abilities.

The use of the Article Structure approach is integrated into daily classroom teaching. The lesson designed was based on the passages in the students' Chinese textbooks. The teacher provided scaffolding and used a structured approach to help the students comprehend the passages and developed their higher order thinking skills. The teachers first demonstrated the design of the Article Structure based on the paragraph of the text, students were then tasked to design the Article Structure to illustrate their understanding of the paragraph or text. This strengthens the students' understanding of the main ideas in paragraphs and the structure of the text. At the same time, this cultivates their higher order thinking skills.

Through the Article Structure approach, the students have shown improvement in their interest and attitude in learning. There was improvement in the students' comprehension skills and they are more confident in facing challenging questions. As the Article Structure was created through the collaboration of students, students have the opportunity to exchange ideas, thoughts and views verbally through their discussions. The students learnt from each other and were highly engaged in the activities assigned. Students stayed on task and were less disruptive. The differentiated instructions addressed differences in learning style among students and classroom anxiety was significantly reduced.

Keyword: Language and Education, Primary Schools

Workshop- WOR384

The Use of Arduinos in STEM Education – A Hands-on and Iterative Approach

Leung Hui leng, Raffles Girls' School (Secondary), Singapore
Yeo Puay Hong, Raffles Girls' School (Secondary), Singapore
IT in Education

Abstract

The advent of technologies such as Arduino microcontrollers has given the man-in-the-street access to tools that were once used exclusively by trained professionals. “Now, almost anyone can innovate. Now almost anyone can make. Now, with the tools available at a makerspace, anyone can change the world” (Hatch, 2014). Hence, the notion of literacy has to be extended to include the use of technology (Leu, 2003) in order for students to participate fully and meaningfully in the world they are living in. One way this could be implemented in the classroom is to bring the maker movement into school-based learning. The authors designed and implemented a new Design and Technology curriculum to promote technology literacy and creative confidence (Kelly, 2013) in 13-year-old students in an all-girls secondary school through the use of Arduinos and iterative design and making. In order to get students to apply the technology innovatively, students solved problems using the Design Thinking approach (Brown, 2008), in which they used various tools to empathise with the target user, find a suitable problem to solve, solve the problem and demonstrate the solution by using a prototype. Working in teams, students applied these skills and knowledge to solve authentic problems faced in the school canteen. The workshop consists of an introductory hands-on session with Arduinos, followed by a discussion on how information technology could be leveraged to enhance pedagogies that are suitable for such a curriculum. The workshop will wrap up with a discussion of the possibilities of using Arduino technology and iterative design and making in the Science, Mathematics and Design and Technology classroom.

Keyword: 21st Century Competencies, Curriculum in Classroom

Workshop- WOR386

Game Development to Up Mathematics Score

Noor Isham SANIF, Madrasah Irsyad Zuhri Al Islamiah, Singapore
Mathematics Education

Abstract

This workshop is based on a study, conducted by Madrasah Irsyad Zuhri Al Islamiah, Singapore, involving 2 groups of 70 primary 4 mixed ability students (10 year old children). In this study, first group of 70 students was engaged in a simple Scratch Coding Game Design in promoting critical thinking, logic thinking and improving mathematics literacy skill. The paper highlight that when Mathematics was taught in context of application in developing a game, students saw the meaningfulness of Mathematics. After a total of about 10 weeks of duration, the study observed a breakthrough difference in average scores between this groups in comparison to another group of 70 students treated with normal Mathematics lesson based only from prescribed Scheme of Work from Mathematics Syllabus by the Ministry of Education, Singapore. The topic chosen for this test was Numeration and Operation. Other than just higher average scores in Mathematics, it was also evidence that the first group of students scored higher indicator for good exposure in active critical thinking, better logical thinking and liking for problem solving. They used lots of numeration and operation to plan and design their game. It was evidence that the concepts of Mathematics was actively learnt through game development and incidentally discovered by these young learners. Along the way, these children use mental calculation, guess-and-check heuristics, which incidentally develop their number sense in Mathematics. Although the Scratch Coding game design required Mathematics teachers to initially use 2 hours to go through simple coding programming lesson, the 70 students were fast in learning concept of game development. They could hardly wait to start planning their game design and storyboard. The workshop will engage participants how to use Game Design to ignite the passion of learners in Mathematics. Participants will use simple Scratch Programming in making learning of Mathematics fun.

Keyword: 21st Century Competencies, Madrasah Education

Workshop- WOR387

General Disorder: Redefining Play with Tabletop Games in the Art Classroom

Tan Hsiao Yuz, National Institute Of Education, Singapore
Visual and Performing Arts

Abstract

Play is often deliberated much in educational discourse, it is deemed to be an important part of learning, especially for a child. The value of play is often celebrated by many thinkers and educators, but there is little consensus on the actual role play has on learning. Dennis (1970) pointed out that this could be due to the fact that it is difficult to define play.

Dewey (1913) offered a definition:

“A name given to those activities which are not consciously performed for the sake of any result beyond themselves; activities which are enjoyable in their own execution without reference to ulterior purpose.”

The absence of a final aim or goal is important in differentiating play from work. Play leads on to more play but work leads to a final goal. This can be easily observed in a child’s activities in its early years with its lack of mindful intent towards material gains in stark contrast to an adult’s efforts in shaping his/her efforts towards a measurable and often visible outcome. While the absence of a goal separates it from work, the presence of an intent precludes play from being any act of fooling around; where the endeavour is neither self-directed or imposed but on impulse or chance.

Play becomes more complex in a child’s later years and rules may become essential for carrying out play effectively. The author proposes the presence of rules within play itself, distinguishes itself as an individual category worthy of separate pedagogical consideration – games, particularly in the domain of art education.

Using case studies as methodology and through the use of games designed for facilitating the understanding of abstract concepts for the art classroom, he hopes to shed more light on the position of games in the overall trajectory of a person’s “playful” learning journey.

As an alternative to findings, the author will like to put up and share his game, TKG ARENA: General Disorder as an opening point in the form of a workshop for art teachers to experience it for themselves in this conference and looks forward to any discourse arising.

Keyword: Action Research, Arts & Music Education

Workshop- WOR388

To Serve Is To Learn? A Systematic Approach Towards Designing A Service-Learning Programme

LEE SIONG BOON, St. Margaret's Secondary School, Singapore
Er Wan Lin, St. Margaret's Secondary School, Singapore
Curriculum Development

Abstract

As a relatively new social and educational experience, service-learning programmes can be poorly conceptualised and designed (Giles, Jr & Eyler, 1994; Sheffield, 2004). The absence of a clear framework is perhaps a service-learning programme's greatest obstacle to its own success. According to Sheffield (2005), there is a need for greater understanding through discussion of the relationship between the service aspect and the learning aspect in any service-learning programme. How this relationship is viewed has an impact on its practice.

Following the lead of Sheffield, this workshop explores the use of philosophical underpinnings to undergird the design of any service-learning programme, to provide a ballast for the programme that would ensure its own success. The theoretical underpinning of the service-learning design is provided by Paul and Elder's conception of the human mind in terms of its functions of Thinking, Feeling and Wanting.

In this workshop, participants are expected to:
- participate in the discussion of how the service aspect and the learning aspect in service-learning should be viewed;
- be involved in conceptualising a service-learning framework that can be used in a school setting.

At the end of the workshop, participants will be able to:
- understand how philosophy can be used to undergird the design of a service-learning programme;
- understand how to incorporate critical thinking tools into service -learning programme to help students make meaningful reflections.

This workshop will be conducted partly in the form of a lecture and the participants will have ample opportunities to interact with the presenters during the hands-on activities.

Keyword: Critical and Creative Thinking, Curriculum Design/Reform

Workshop- WOR392

Desmos.com Changed the Way I Teach Mathematics

Martha Mulligan, Northside College Preparatory High School, United States of America
Mathematics Education

Abstract

Lecture less and teach more. After teaching for several years, I've learned that when I allow students to conduct structured investigations, make discoveries, solve interesting problems, and collaborate with their peers, they learn mathematics because that's what mathematicians do! In recent years, I have developed classroom activities which employ the free, online graphing app at desmos.com. In this workshop, participants will use their own wifi-enabled devices to access a pre-created activity which will investigate properties of quadratics and their graphs. Participants will see how transformations 'come alive' with the graphing app. Then, I will guide them in editing the activity for their own purposes AND/OR in creating or editing other activities that they may use in their own classrooms with their own students. Throughout the workshop, I will help participants produce their own classroom activities which they may use immediately, save for future use or both.

Participants will see how the activity builder allows students to have a more personalized experience in their learning, allows teachers to create innovative lessons catered to their students, and permits teachers to individually monitor student learning in the moment of teaching. This tool is both a means to help students better understand key mathematical ideas and a means to help teachers better understand what students know. Without relying on purely lecture to convey important mathematical concepts, teachers can focus on deeper understanding and better retention in students.

Participants must have their own devices (laptops preferred) and workshop must be held in a wifi-enabled facility.

Keyword: Information Technology and Education, Mathematics Education

Workshop- WOR395

Class-Based Social Skills Training: Enhancing Social Skills of Students to Promote Prosocial Behaviours and Positive Classroom Culture

Shen Pinxiu, Ministry of Education, Singapore
Tan Ee Na Joanna, Ministry of Education, Singapore
Liew Pei Chin, Ministry of Education, Singapore
Cognition, Motivation and Learning

Abstract

Teachers may find managing the misbehaviours of students a challenge. Disruptive and rude behaviours often affect learning and relationships in class. These behaviours may be attributed to the students' lack of social skills and understanding of prosocial norms and behaviour. Social skills are sets of behaviours that enable individuals to interact with one another in ways that are socially acceptable, as well as personally and mutually beneficial, or beneficial to others (Elliot & Gresham, 1993; Hensley, Powell, Lamke & Hartman, 2007). To help the students to be self-managers, social problem solvers, and successful in learning, equipping them with social skills is a necessity. This involves an educative process of systematic teaching of social skills, timely reinforcement through praise and corrective feedback, and consistent modelling by the teachers. Students with prosocial behaviours form positive and meaningful relationships with their peers, building a positive culture in the classroom and school.
In this workshop, participants will learn about (i) a class-based social skills training in Secondary schools through hands-on activities on social skills practices, (ii) the study on its effectiveness on students' behaviours, and (iii) case studies on how it is implemented in the schools. A study using a quasi-experimental repeated measures design was conducted with 10 Secondary One classes. During the nine-week intervention, students attended social skills lessons from three themes: personal management, relationship management and learning. Students in the comparison group underwent school-based Character and Citizenship Education programmes. A pre-test was carried out using the School Social Behaviour Scales (Singapore). Post-tests were carried out using the same scale at two points: immediately and three months after the intervention. Results showed statistically significant and medium effect size increase in pro-social behaviours and reduction of social behaviour problems in only the intervention group. The changes were sustained after three months. The behaviour improvement was greatest for students who started off with the greatest deficits (i.e. lowest pro-social behaviour and / or highest social behaviour problem scores). Together, this workshop will provide educators with practices to promote prosocial behaviours in students and to shape positive classroom culture.

Keyword: Classroom Management, Curriculum in Classroom

Workshop- WOR400

Learning through Geographical Field Inquiry for High-Ability Learners

Roslinda Chan, Raffles Girls' School (Secondary), Singapore
Eriyanty Mohd, Raffles Girls' School (Secondary), Singapore
Yeo Jun Han, Raffles Girls' School (Secondary), Singapore
Koh Bock Yin, Raffles Girls' School (Secondary), Singapore
Humanities and Social Studies Education

Abstract

Research supports the use of inquiry as an instructional approach for students of high ability (VanTassel-Baska, J., 2003). This workshop discusses the use of Geographical Inquiry, specifically Field Inquiry, as an integral approach to the teaching and learning of skills, concepts and content knowledge in Geography in an all-girls secondary school which caters to high ability learners (HAL) in Singapore.

"A Geographical Inquiry approach provides students with the opportunity to 'ask relevant questions, to pose and define problems, to plan what to do and how to research, to predict outcomes and anticipate consequences, and to test conclusions and improve ideas" (Roberts, 2003). This inquiry approach is thereby a core feature of the Geography curriculum in the school for the 13-16 year old students.

One of the ways in which students engage in Geographical Inquiry is through fieldwork. In the school's Geography curriculum, the opportunities for learning outside the classroom is systematically designed to take place during school-based fieldwork, Learning Journeys (LJs), enrichment activities and overseas trips. This approach is undertaken because fieldwork helps students to understand complex Geographical concepts better. It facilitates the active construction of knowledge by students and aids them in making meaning of textbook knowledge in the realities of the field.

This workshop highlights how field activities have been designed to get (HAL) to be active learners, acquire critical thinking and problem-solving skills, and to develop citizenship values as well. The students undergo the elements of field inquiry such as:

- Writing and/or testing hypothesis
- Collecting data through fieldwork skills
- Analysing and synthezing field data
- Representing field data in a field report

Findings based on a student perception survey, student assignments, student reflections on learning through this approach will be shared. However, there were challenges faced in integrating field inquiry into the Geography curriculum. Therefore, this workshop will be useful for educators on how to develop field inquiry activities, address concerns and challenges that educators might face in planning and developing competency in field inquiry skills.

Keyword: Curriculum & Pedagogical Innovation, Humanities and Social Studies

Workshop- WOR401

Developing SEL Competencies in students through Self-reflection and Assessment

KYAW SAW LYNN, Anglo-Chinese Junior College, Singapore
THAM PEISHAN, Anglo-Chinese Junior College, Singapore
Civics and Moral Education

Abstract

Education has been one of the key drivers in developing character and instilling sound values in our students. While teachers play a pivotal role in nurturing social emotional learning (SEL) competencies in our students, we also recognise that students need to take ownership of their own learning to sustain it beyond the classrooms and even to the future. As such, it is pertinent to continually engage our students in dialogue to draw out their learning. Through this process, it allows the students to develop self-assessment and self-reflection skills; a lifelong attribute which will better prepare them for the future. However, a common difficulty often lies in a lack of shared vocabulary between teachers and students to articulate these competencies.

To address this issue, we designed and made use of a SEL assessment rubrics as an innovative pedagogical approach and framework for teachers and students alike to have a common language for conversations on the students' self-reflection of their learning of values. The students carry out the self-assessment in the SEL areas using the given rubrics and provide evidence that will support their self-assessment before meeting up with their Form Teachers. In addition, the students will also seek feedback from their peers and co-curricular teachers so as to obtain comments from various perspectives. The Form Teachers then take on the role as mentors and facilitators of learning by asking students reflective questions so that they may better synthesise their own learning of SEL competencies.
In this session, participants will have an opportunity to understand the design of the assessment rubrics as well as implementation and use of it. Participants will also have a hands-on experience in using the rubrics to ascertain students' SEL competencies.

Keyword: 21st Century Competencies, Moral Education/Development

Workshop- WOR402

Two Teachers Better than One? - Team-teaching in a Team-based Learning (TBL) Context

Lishan Yang, Nanyang Technological University, Singapore
Jessica Ang, Nanyang Technological University, Singapore
Educational Policies and Practices

Abstract

At the inception of Lee Kong Chian School of Medicine (LKCMed), a medical school formed from a partnership between Nanyang Technological University and Imperial College London, curriculum planners were faced with a challenge – how to implement constructivist and progressive pedagogical methods for large class sizes of up to 108 undergraduates, while still ensuring high quality education and student engagement? The issue was compounded by working with a large and diverse faculty mostly comprised of clinicians, most of whom take time out from their busy clinic or hospital schedules for just a few days a year to teach, and who themselves were products of a more didactic mode of education.

The solution was to institutionalise Team-based Learning (TBL) across the curriculum for First and Second Year students, with a rotational team of faculty as Content Experts, and a set team of Facilitators, trained in student-centred and constructivist pedagogy, as Process Experts. Each TBL session features one or more Content Expert(s), but only one Facilitator. TBL uses the model of the 'flipped classroom' approach to teaching and learning, providing real-world scenarios that make students think through problems as they work collaboratively. A well-planned TBL curriculum can result in high levels of student accountability and engagement. LKCMed's 4-year experience with TBL and team-teaching has shown that insofar as the curriculum is properly structured, supported, and planned for, even two complete strangers can come together and team-teach a meaningful session for a large class of students.

Aside from Medicine, team-teaching is potentially applicable to courses that involve a multidisciplinary teaching team or rotational faculty of industry experts, or introductory courses that cover a broad sweep of topics. At this workshop by two of LKC's TBL Facilitators, participants will explore:

- How to use constructivist pedagogical approaches such as TBL in their teaching contexts.
- Different formats of team-teaching, and how they could fit arious educational contexts.
- How to overcome potential challenges to achieve synergy in team-teaching practice.
- How to structure curriculum to align to a team-teaching model, taking into account student learning outcomes.
- How to prepare faculty for team-teaching within a constructivist educational context.

Keyword: Collaboration/Collaborative Learning, Curriculum & Pedagogical Innovation

Workshop- WOR404

The Rasch Model made easy: Leveraging psychometrics in our classroom assessments

Vahid Aryadoust, National Institute Of Education, Singapore
Assessment

Abstract

This workshop seeks to introduce the basics of Rasch measurement and its application in classroom assessments. The worship will take a handy psychometric approach where the principles of the Rasch model are explained in a simple language to teachers and practitioners. Participants will have a chance to use the software package WINSTEPS, apply the Rasch model, and output several useful information about their tests. The information will be used to evaluate the validity of the tests; examine the degree to which students' performance is in line with our expectations; and examine whether the test items that we develop for in-class and assessment purposes engage the desirable attribute(s).
The topics covered in the workshop are as follows:
1. Assessment and measurement in classrooms
2. Introduction to WINSTEPS, an easy-to-use Rasch model computer package (presentation and hands-on).

Four primary features will be discussed:
- Item difficulty and person ability
- Item-person map
- Fit statistics
- Reliability, separation, and error of measurement

A time-limited version of WINSTEPS will be provided by Dr. Mike Linacre, the developer of the computer package, for the workshop. Participants will be given opportunities for hands-on practices and discussions.
It is expected that after the workshop the participants will be able to apply their knowledge and experience with the Rasch model in their in-class and large-scale language tests and examine the validity of the students' scores.
Anyone who is interested in assessment and measurement is welcome.
Participants will be provided with a link to install the software on their laptops, if they prefer to use their own laptops.

Keyword: Assessment, Classroom Research

Workshop- WOR409

Using Art Journal as a tool for active re-search in Art learning

Jennifer Ng, Anglo-Chinese Junior College, Singapore
Visual and Performing Arts

Abstract

For ages, the art journal has been an essential item for the artist. As an artist-teacher, I used the journal to record thoughts and work processes, plans and sketches as I conceptualised and experimented with potential ideas. The art journal allows internal dialogues to take place as it directs and informs the artist through constant self-reflections. It could be regarded as the closest tool to access the tacit knowledge of the artist. Tacit knowledge is referred to as the kind of knowledge that one may not be aware of, but which they may be inferred to know (Oxford, 2016).

Art journaling is therefore a reflexive practice directed by artistic processes. The approach focuses on magnifying both reflection-on and reflection-in the studio practice. Reflection-in action suggests that reflection takes place during the course of action. This refers to the time when action is present and that the action can still affect the situation (Schon, 1983). Reflection-on practice on the other hand refers to reflection that takes place after the action, when the action no longer has an impact on the situation. In this view, art journaling becomes a dominant impetus for continuous learning. It encourages students to seek multi-sensorial ways of knowing.

From its initial form akin to that of a mini hand-held museum, students' journals often transform into versatile banks filled with personal thoughts, inspirations and endless ideas. Within a freely associated playground of artistic thoughts and creative play, the pages of their journals revealed artistic recordings to be observed and re-observed, search and re-searched.

In this workshop, participants will experience the process of internal dialoguing through interactions with objects. This process of internal dialogue can be instrumental in students creating and developing ideas. Of interest will be participants' explorations and perspectives on the transferability of this approach across different subjects.

Keyword: Arts & Music Education, Critical and Creative Thinking

Workshop- WOR423

TEACHING HIGH ACHIEVING STUDENTS USING A MULTIDISCIPLINARY APPROACH INVOLVING THINKING ROUTINES

Haliza, Fairfield Methodist Secondary School, Singapore
Trixie Chan, Fairfield Methodist Secondary School, Singapore
Germaine, Fairfield Methodist Secondary School, Singapore
Laura Or, Fairfield Methodist Secondary School, Singapore
Curriculum Development

Abstract

The basic aim of this workshop is to show how teachers of different subjects such as English, Mathematics, and Science, can collaborate in planning lessons that help students to deepen their learning and become critical thinkers. The lessons to be illustrated are all linked to a common theme that potentially provides students to see the wider applications of their different subjects to the real world. The theme chosen is “Global Warming” and the key essential question is: “What is the main cause of global warming?”

There are several objectives intended for such a teaching approach. First, is to allow high achieving students to think broadly and to see the connectivity between their different academic subjects. Second, by giving students ample opportunities for small group discussions integrated with thinking routines, they are able to develop greater confidence, stronger social skills, and critical thinking – all important competencies for citizens of the 21st Century. During the learning process, students are frequently engaged in consolidating their understandings using the ‘Peel the Fruit’ routine. Besides this, other thinking routines such as “See-Think-Wonder, Think-Pair-Share, and I used to think; now I think” are applied in order to make student thinking more “visible” for further actions by both peers and teachers.

Based on the post-lesson student survey results, about 76% enjoy using the thinking routines in groups as they are able to learn much more from peers and share their knowledge with them. There is also strong agreement that their ideas and opinions are better heard, which allows them to acquire greater self-confidence. Finally, more than 90% find the multidisciplinary approach enables them to clearly see the linkages between different subjects and to have greater appreciation of the real-world applications of their academic subjects.

At the workshop, participants will not only hear about the results of the survey but will also be given hands-on experience on how the multidisciplinary approach has been carried out in a Secondary One classroom. They will also learn about the thinking routines that are used as well as provided with the resources that have been developed for the lesson activities.

Keyword: 21st Century Competencies, Critical and Creative Thinking

Workshop- WOR424

Making for science education: reconsidering the nature of science in science instruction

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SingTeach Special Workshop

Abstract

Makerspaces have captured the public imagination, providing opportunities for the open and student-directed exploration of advanced manufacturing technologies, and as an engaging context for acquisition of associated science, engineering, and mathematics domain knowledges. While important, the higher value of making activity for science education lies in its potential for learners to acquire insights into the nature of science not accessible through traditional instructional approaches. Specifically, while inquiry approaches have become popular in recent years, progress has yet to be made in communicating the complexity of knowledge generation. For instance, given anomalous results in an investigation, how should students determine if an 'equipment error' has occurred, or that a different theoretical explanation ought to be chosen? In the former, we have come to understand that interpretation of natural phenomena requires scientists to acquire particular tacit knowledges of how to 'tune' systems to the narrow range where results make sense; in the latter, what makes an explanation better than another remains a question that is insufficiently attended to. For an education system interested in science instruction for innovation, it is important to appreciate that innovativeness requires learners to become familiar with the discomfort of generating new knowledge. For science instructors heavily invested and highly skilled in communicating canonical knowledge forms, the dominant instructional strategies for achieving student success in assessments can be a hindrance to the nurturance of innovation. Developing these dispositions require instructors to devolve epistemic authority and reposition learners as active, agentic individuals embedded within a culture engaged in acquiring new ways of practice.

In this workshop, I will introduce to participants some recent developments in understanding the nature of science, specifically attending to the nature of knowledge growth and of innovation. Ideal participants should be science educators who are eager to educate for innovativeness and are curious about the nature of science. Participants will come to understand how the design method can contribute to science instruction, and how the making of artefacts can be a central feature in this learning process.

Keyword: Science Education

Workshop- WOR432

Building a Reading Culture through the School Library

LOH Chin Ee, National Institute Of Education, Singapore
Wan Zhong Hao, National Institute Of Education, Singapore
SingTeach Special Workshop

Abstract

Much research demonstrates the correlation between leisure reading (otherwise termed as free, voluntary or extensive reading) and reading achievement. Besides gain in reading comprehension, vocabulary growth, spelling ability, grammatical usage and writing style, students who read well are able to access more texts and knowledge through wide and varied reading. Good readers thus gain more by reading more whereas weak readers who have to exert more effort at decoding are less likely to be motivated to engaged in further reading required for improved comprehension and knowledge acquisition. As such, reading engagement is an important component, particularly for motivating poor readers.

The school library can serve a central place for building a reading culture. However, little attention has been paid in Singapore to how school libraries can be more effectively utilized as key spaces for encouraging reading and learning. Drawing on current research on school libraries and on our large-scale research of how reading and learning is enacted in six secondary schools in Singapore, this workshop presents ideas and strategies to build a strong reading culture in schools through the school library. Factors for building a reading culture include: (1) Designing conducive spaces for reading, (2) Curating the selection for readers, (3) Creating programmes to excite readers, (4) Setting the school's reading expectations, and (5) Implementing policies to support reading. The workshop specifically explores secondary school libraries and provides suggestions that are targeted at adolescents.

Keyword: 21st Century Competencies, Language and Education

Workshop- WOR443

Scaling out teaching and scaling up learning through flipped classroom

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QI Xinyu, The University of Hong Kong, Hong Kong
Yeon Jeong Elizabeth Oh, The University of Hong Kong, Hong Kong
Emily T. Y. Leung, The University of Hong Kong, Hong Kong
Chi-Un Lei, The University of Hong Kong, Hong Kong
IT in Education

Abstract

The emergence of technology inside the classroom is becoming more and more evident. The role of teachers has also evolved in the past decade. Now, teachers are expected to integrate technology to improve their teaching and to explore the possibility of scaling up learning. These expectations would require learning new skills and getting acquainted with the technical aspect of instructional design. This workshop will give you an overview of the processes involved in creating an online component for a blended learning experience. We will go through design considerations and implementation skills for e-learning at three different phases: Design, Implementation, and Evaluation. By the end of the session, participants should be able to approach online teaching with a broadened lens and come away with the skills required to kick-start their e-learning journey.

The workshop will be divided into three major topics. Design: In this phase, we will learn the basic scripting and storyboarding through an activity. The participants will create a short story out of a general topic. Then, they will design a storyboard that will represent their story. We will also look into the fine details that involve the workflow of the video making process. Implementation: Then, we will focus on the learning management system (LMS), particularly Open EdX. The participant will have the opportunity to play around with the LMS to have a first-hand experience of its basic functions, ranging from the assessment types up to LTI (Learning Tools Interoperability) plug-ins that are currently available. Evaluation: Finally, we will wrap up the session by exploring a simple analytics tool provided by YouTube. We will look closely into the nitty-gritty details such as retention rate, watch pattern, average views, demographics, and traffic sources. This analytical tools can be used to inform future changes in the design process. It will also give us some insights to the online learning behavior of learners.

Keyword: Information Technology and Education, Teacher Education/Development

Workshop- WOR506

Global Education Transformation-Human Capital Development - Secondary Education-Maths/Science/Technology Integrated as Teaching Tools

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P. Raghavan Venkkatesan, GRINATI School of Science Studies, India
Cognition, Motivation and Learning

Abstract

Creating Human Capital is vital for any economy to position herself in the competitive, technological growth and bridge the vacuum of the versatility demand, this emphasises Pedagogy Innovation to elevate their young citizens for the Inclusive Economic growth.
The research paper (Project GRINATI) focussed on using senses especially seeing (75%) and hearing (13%) imbibed into learning in the Middle and Secondary School (Age 10 - 19) to clearly define thought process for better understanding to Read, Think, Learn, Relate, Workout and Apply.
The much needed Integrated Research of Math, Physics/ Chemistry or Science/ Technology in general for Secondary Students would have the Scholarly Demonstration during the workshop presentation to augment the Knowledgable and Critical Thinking focusing on the Industry and Economic Demand, to address the audience and create the understanding of existence of the Next Century Learning.
Thus the finding of innovative Teaching Tools for teachers blends the resource (Curriculum) into SIMPLIFICATION, breaking down of fundamentals into uncomplicated fragments and MAPPING which gives concise input of overflowing information in unambiguous manner and the great advantage of VISUALISING helps in retention for recall.
The Desired Outcome-
Learning: The assimilation of what is learnt helps in retention, thus recalling is possible. It enables Critical thinking, Applying, Identifying and thus Executing.
Identify: Knowledge thus acquired through the Learning Process, Identifies the problems that need to be solved at any given occasion be it at Academics or at Work
Execute: To precisely plan and execute the solution through learned facts and gained through experience, Knowledge plays the vital role.
]The Key Deliverable is strengthening Middle / Secondary School Education, KQ Knowledge Quotient Improves, which creates Inclusive Knowledge growth thereby lessening dropouts or students becoming Ineligible for Tertiary Education and/ or not readily available to perform jobs.
Empirically evident finding through Group of students (Age 10 and above) when learnt through this Novation technology scored well than their peers and some Topics had change in momentum from “dislikes” to “likes” with this novice transformation. This enriches average student to be equipped with knowledge at par with quick grasping ones is one of the inference on assessment.

Keyword: Curriculum & Pedagogical Innovation, Teacher Knowledge & Cognition

Workshop- WOR514

Flipping the paradigm of learning with Flipped Team-Based Learning for 21st Century Competencies

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IT in Education

Abstract

With global shifts in emphasis of 21st century learning towards the creativity and innovation (Tsai et al. 2013), engaging students in rigorous learning processes that build learners' capacity to create knowledge is imperative. Learning processes, which involve Self-Directed Learning (SDL), Collaborative Learning (CoL) and Higher-Order Thinking (HOT) have shown to enhance students' efficacy in creating knowledge (Scardamalia et al. 2012).

Funded by Edulab, Flipped Team-Based Learning (Flipped-TBL) is a technology-enabled pedagogical approach that aims to provide opportunities for students to acquire essential 21st Century Competencies (21st CC) such as Self-Directed Learning (SDL) and Collaborative Learning (CoL). Through Flipped-TBL, students will also engage in higher-order thinking (HOT) activities for deep learning.

Flipped-TBL combines the merits of the "Flipped Classroom" and "Team-Based Learning Model". The Flipped Classroom provides students with the autonomy in learning and enhances SDL (King, 1993). The TBL model, a special form of collaborative learning structure using a specific sequence of individual work, group work and immediate feedback to create a motivational framework (Michaelsen, 2003), promotes CoL.

At each stage of Flipped-TBL, the phases of SDL (Gibbons, 2002) are unpacked and delivered with the help of technological tools. Macro design principles of CoL (Scardamalia, 2002) were utilised to create environments conducive to collaborative knowledge building. Students progressed through lower levels of Bloom's Taxonomy at the initial acquisition of knowledge and through the higher levels (Pohl, 2000) during the higher-order Application Activities, where they also harnessed on technological tools' affordances to co-construct knowledge and solve meaningful problems.

This presentation will highlight the positive impact of Flipped-TBL on students' learning and 21st CC acquisition. This study has witnessed a shift in the students' role from being passive recipients of information to one of active learners, taking charge of their learning. They experienced the joy of learning as they immersed themselves in the process of creation to acquire new knowledge and essential 21st CC.

Through the workshop, participants will experience first-hand on the Flipped-TBL model and how they can promote HOT and 21st CC. Other takeaways include design principles of Flipped-TBL lessons and exploration of educational technological tools for Flipped-TBL instruction.

Keyword: 21st Century Competencies, Curriculum & Pedagogical Innovation

Workshop- WOR531

A Pedagogical Approach for Error Analysis And Customised Learning Intervention In A-Level Biology

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Assessment

Abstract

Teacher feedback has a powerful impact on learning. Commonly experienced, however, is that while teachers write detailed comments on students' answers, the benefits of these written comments are limited by students' inability to fully grasp the meanings and suggestions conveyed as they may find the comments incomprehensible. The full impact of assessment for learning is restricted as students can only glean question-specific and not subject-specific skills, hence limiting students' capacity for conceptual applications. Both students and teachers may end up feeling frustrated with recurring learning gaps of similar nature and teachers may resort to the familiar routine of repeated practice. The fundamental problem lies in the lack of common vocabulary between teachers and students in identifying subject-specific competencies.

To address this issue, we designed a twinning assessment-pedagogical approach aimed at effectively combining the benefits of assessment for learning and deep conceptual understanding. The approach was implemented to provide customised intervention for students who needed remediation support. The teachers constructed an error analysis approach for students to acquire a common set of vocabulary to self-analyse their assessment papers. This facilitated students' qualitative differentiation of the gaps in their answers and them seeking deeper understanding. Subsequently, the teachers designed lessons which adopted appropriate teaching intervention. This involves the identification of content errors, accurate expression of scientific concepts and phrases and the unpacking of questions. Through the customised intervention, students acquired both greater understanding of their learning gaps as well as the motivation to be more self-directed in their learning efforts.

In the workshop, the department will share its rationales and principles in the design of this assessment-pedagogical approach and conduct a hands-on activity for participants to experience the use of the error analysis vocabulary. There will also be opportunities for participants to share their perspectives on how the approach can be refined and transferred to other academic disciplines.

Keyword: Assessment, Curriculum & Pedagogical Innovation

Workshop- WOR566

Cultures of Thinking: Seeding Visible Thinking Routines in the English Language Classroom Workshop

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Beatrice Tan Pui Leng, Dunearn Secondary School, Singapore
Teacher Quality, Teacher Learning and Development

Abstract

This workshop aims to share the practice of Visible Thinking routines used by English teachers at Dunearn Secondary School. The presenters, who embody rich experience and youthful initiative, will share their thoughts on their application of the routines, and discuss the outcomes and challenges surfaced. By providing opportunities for meaningful connections between teachers on their classroom practice, the presenters are heeding the call for 'schools to be cultures of thinking for teachers.' (Ritchhart, 2007)

'Visible Thinking' is an approach developed by Ron Ritchhart and researchers at Harvard University's Project Zero that makes thinking an explicit and overt part of classroom discourse, for the purpose of deepening students' subject-matter learning. In our opinion, Visible Thinking routines invoke the form of a common language for the sender and receiver of ideas, allowing students and teachers to base their classroom interactions on mutually understood grounds. Their consistent application serves to provoke inquiry and organize concepts. Visible Thinking routines also provide clear and immediate feedback for teachers on their students' understanding of a topic, which helps to improve our teaching practice by customising lessons to meet the needs of the students.

Objectives
1. To discuss strategies for making student thinking more valued and visible in the classroom.

Teachers will be introduced to the 8 Cultural Forces key to promoting a thinking classroom. The workshop will expose teachers to specific thinking routines that have been used by the presenters, providing teachers an opportunity to consider their application in their own classrooms.

2. To discuss strategies for documenting students' thinking and learning for monitoring students' progress.

Teachers will have the opportunity to discuss the different ways they assess students' learning and the challenges faced. The shared learning will reveal some strategies which can be modified to suit the context of their schools or classrooms.

Keyword: Student Knowledge & Cognition, Teacher Education/Development

Workshop- WOR586

Delivering a responsive model of trans-disciplinary research and engagement that addresses community needs: The Early Start Responsive Research Approach

Tony Okely, University of Wollongong, Australia
Marc de Rosnay, University of Wollongong, Australia
Early Childhood Education

Abstract

A core component of the Early Start initiative at the University of Wollongong (UOW), Australia, is the partnership with early childhood education and care (ECEC) centres across the state of New South Wales. These centres – referred to as Early Start Engagement Centres – are autonomous and located predominantly low-SES communities. They are connected to the Early Start Facility at UOW by a technology suite.

Early Start is working with the Engagement Centres to better understand the children in their care, and to grapple with the challenges of improving outcomes for vulnerable children in largely mainstream centres. Early Start is doing this using a responsive research approach. This approach involves the development, implementation (by staff in the Centres) and evaluation of a suite of evidence-guided programs in critical areas of early learning and child development. The programs may include testing existing “best-practice” programs or developing these from scratch in key areas where development is lagging.

A key feature of the approach is the collection of baseline child and centre environmental data from each of the Centres and feeding these data back to Centre staff to identify the areas of greatest need for intervention. We have found this to be a very powerful experience for staff and results in greater “buy-in” to bring about change in their centre. As part of the implementation, the initiative includes a comprehensive educator professional development program for around 35 Engagement Centres based on our extensive work in this area over the past 20 years. The delivery of the professional development package also leverages technology to increase opportunity for future scalability.

This workshop will describe in detail the steps Early Start underwent in developing its Responsive Research Approach, the data that were collected, how these data were fed back to centres, and the subsequent professional development that has occurred. Some examples of prototype programs or practices that have been developed and tested in situ will be provided. It is hoped that these programs and the professional development model for implementing and sustaining them will be able to be adapted and scaled to other communities.

Keyword: Early Childhood, Professional Development

Workshop- WOR618

Publishing in Academic Journals – Tips to help you succeed.

Jenni Lien, Publisher - Taylor & Francis (Hong Kong office), Hong Kong
Publishing

Abstract

Publishing in Academic Journals – Tips to help you succeed.
The aim of the workshop is to bring attention to common pitfalls before and during the journals publishing process. It is designed not to teach how to write a paper, but instead to offer advice on presenting a paper in the best possible light, choosing the correct journal to send it to and highlighting the most common reasons why a paper is rejected. Topics to be covered:

- Why publish?
- Choosing the right journal
- What is Open Access?
- Tips on writing for a journal
- Ethics of Publication
- The Peer Review process
- Promoting your journal article

Keyword: Professional Development

Workshop- WOR639

Literature as a Path to Expanding Creativity and Deepening Moral Understandings

Prof. Stephan Ellenwood, Boston University, United States of America
Language and Literacy Education

Abstract

The Nobel Laureate author Saul Bellow imagined once that the 21st century will become known as the Age of Distraction. He worried about the electronic age cultivating an atmosphere of superficial dazzle. Similarly, Milan Kundera spoke of the dangers of speed emerging as a false ecstasy. Educators in the 21st century must help students avert dangers Bellow and Kundera identified while also equipping them to take advantage of the expanded opportunities provided by advancing technology. One of the hallmarks of a richly educated person is the ability to reach beyond the blandishments of speed, sizzle, and easy pleasures of constantly familiar situations. Wise educators and parents create situations convincing students that their horizons are wide. The ability to enjoy, understand, and analyze good literature affords important opportunities for experiencing new cultures, new ideas, and new individuals.

This presentation focuses on diverse ways that educators and parents of students at all grade levels effectively use stories to integrate five fundamental communication skills – reading, writing, speaking, listening and viewing. Participants examine three short stories from different cultures and at different grade levels. One story will be told; one read; and one seen. Through engaging activities students discover that if they learn to look closely, stories are a part of our lives all day, every day. In addition, they understand how vivid stories engage us in dialogue with others and with ourselves about choices characters made, or could have made, or should have made. They learn how good writers write not so we will read a story, but so that we will see a story. Our imaginations are stimulated when teachers explain the attention to detail practiced by good authors. Students at all grade levels see how simple and complex moral choices inhabit nearly just about every human experience. And eventually when educators base their teaching of stories on a coherent pedagogical plan with thoughtful goals students come to learn that they, in fact, write their own life story, through the large and small choices we all make on

Keyword: Curriculum & Pedagogical Innovation, Ethics