

Nurturing Critical and Creative Thinkers through Inquiry-Based Teaching and Learning in Early Childhood Care and Education





Nurturing Critical and Creative Thinkers through Inquiry-Based Teaching and Learning in Early Childhood Care and Education

A PHOTO ESSAY

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FOREWORD

The study on "Nurturing Critical and Creative Thinkers through Inquiry-Based Teaching and Learning (IBTL) in Early Childhood Care and Education (ECCE)" is broadly anchored on the general themes of ECCE and is in line with promoting 21st century skills which is part of SEAMEO INNOTECH's programmatic priorities under its 8th Five-Year Development Plan 2011-2016 and 9th Five-Year Development Plan 2016-2021. The study also contributes to SEAMEO's seven priority areas for Southeast Asian Education Agenda 2015-2035 and the new Sustainable Development Goal (SDG 4) on education (2016-2030).

Covering six SEAMEO Member Countries, the study documented various IBTL practices that nurture the critical and creative thinking of pre-school and early grade learners, not just as a pedagogical approach, but also as an approach to thinking. Developing the discipline of inquiry-based learning as early as age 3 to 8 facilitates the development of 21st century skills and prepares the child for further schooling.

Children learn most effectively through activities that are prompted by their curiosity and needs. It is inherent in their age to ask and as such, teachers should take advantage of this learning mode by asking questions that challenge their thinking and/or imagination, and providing feedback that guide their learning. Inquiry-based teaching and learning as an approach places students' questions, ideas, and observations as essential elements of the learning experience.



This photo essay is one of the several knowledge resources produced from the IBTL study. The Center hopes that through the photographs featured in this publication, Ministries of Education and ECCE institutions will gather ideas on how different IBTL practices can be adopted to help stimulate children's critical and creative thinking skills.

K. - 9 - B. ... Center Director

BACKGROUND

SEAMEO INNOTECH, in cooperation with SEAMEO Member Countries, has initiated a research project entitled "Nurturing Critical and Creative Thinkers through Inquiry-Based Teaching and Learning (IBTL) in Early Childhood Care and Education" (or IBTL Project). It aims to document various case examples of inquiry-based teaching and learning aimed at developing critical and creative thinking among children, particularly for those aged 3 to 8 years, and which are adapted to the contextual realities in Southeast Asia.

This descriptive research pondered on the central question: *How does inquiry-based teaching and learning nurture critical and creative thinking skills of children ages 3 to 8 years?* The study carried out desk review, focus group discussions, key informant interviews, and classroom observations. Surveys were also administered to gather school data/profiles. The research instruments include interview guide questions, school and teacher profile survey forms, and classroom observation checklist. Key informants include key officials from national/subnational Early Childhood Care and Education (ECCE) institutions and Ministries of Education (MOEs) involved in the provision of ECCE, school heads, teachers, parents and students. In-country visits in Brunei Darussalam, Malaysia, Philippines, Singapore, Thailand and Vietnam were conducted from January to March 2016. A common set of criteria was used to select target schools from pre-kindergarten to Grade 3 — for the study. The criteria for selecting a school were as follows: (a) must have adopted an IBTL approach, preferably in the last 3 to 5 years; (b) can either be a national public or private institutions (c) should not be an international institute, and (d) can be a small school (e.g., not more than 300 students) or a large one in terms of student population. International schools were excluded since they follow an international curriculum different from the host country. Thus, replication of teaching and learning approaches from international schools would be difficult because regular public and private schools follow the MOE-mandated curriculum.

A photo essay was developed to highlight unique examples of IBTL implementation for pre-school and early grade learners in 16 selected schools from the six countries visited.

ABOUT THE PHOTO ESSAY

This photo essay features over 70 photos that illustrate how teachers use IBTL in developing the creative and critical thinking skills of young children. The images vividly capture inquiry-based teaching and learning in action. They depict activities showing how learning outcomes are achieved. They tell stories of children's innate curiosity and unlocking children's creativity and imagination.

The arrangement of the photos was guided by the IBTL process framework and its phases. Some activities and photos cover various stages of the framework and hence appear repeatedly in this publication.

The research team did not include in this publication, photos without prior or explicit consent from parents.





WHAT IS IBTL?

Inquiry-based teaching and learning is a learner-centered approach that allows students to gain knowledge by engaging them to formulate questions about a topic, encouraging them to probe and use evidence to find or create solutions to problems, promoting the use of new knowledge in a context that they can relate to, and foster sharing of knowledge with others. In IBTL, teachers or instructors serve as facilitators of information-processing rather than the sole sources of information. IBTL incorporates many learning approaches such as projectbased learning, design thinking, hands-on learning or field work, case studies, and investigations. The Lutheran Education Queensland outlines the following as hallmark characteristics of IBTL:

- "Equal emphasis on process (communicating, reflecting, collaborating, analyzing, etc.) and content;
- Genuine curiosity, wonderment and questioning (by teachers and students) are central;
- Student 'voice' is evident such that elements of the curriculum or learning are negotiated and student questions are taken seriously and addressed;
- Prior knowledge is ascertained and built upon;
- Significant concepts and essential questions are identified which unify knowledge and understandings;
- Students are actively involved in constructing understandings through hands-on experiences, research, processing and communicating their understanding in various ways;

- Learning takes place in a social context wherein students learn from each other, together with others, and from those outside of the classroom context;
- There is an assumption that understandings are temporal and are constantly reviewed and refined on the basis of new learning and questions;
- Reflection, metacognition and depth of thought are valued and planned for;
- Assessment is on-going and clear criteria link performances or products to rigorous curriculum goals; and
- Learning leads to action, e.g., informing or sharing with others, implementing change, advocacy or taking up further questions or learning."

The IBTL as a learning approach has a number of models. One of the basic models of IBTL is the 5Es Instructional Model, which is divided into five phases, namely: engagement, exploration, explanation, elaboration and evaluation.¹ The 5Es is commonly used in teaching science but the competencies for each phase can be applied in teaching other learning areas.

¹ Rodger W. Bybee et al., The BSCS 5E Instructional Model: Origins, Effectiveness, and Applications, (Colorado, USA: Biological Sciences Curriculum Study (BSCS), 2006), accessed April 11, 2016, http://www.bscs.org/../BSCS_5E_Instructional_Model-Executive_Summary_0.pdf.

PHOTO CREDIT: SEAMEO INNOTECH (2016)

THE IBTL PROCESS FRAMEWORK AND ITS PHASES

To guide this study, SEAMEO INNOTECH developed the IBTL Process Framework (page 8), which adheres to the 5Es Instructional Model and combines other related research on IBTL.

The teaching and learning process starts with **engagement**. During this phase, the teacher accesses the students' prior knowledge and introduces a topic or idea to capture students' interest, curiosity and attention. The teacher acts as facilitator in generating a topic, which can trigger students' interest to actively participate in class discussion. The second phase is **exploration**, where the teacher provides developmentally appropriate materials to stimulate inquiry, encourages students to gather data and evidence, and motivates them to analyze and use the information and evidence gathered. In the exploration phase, students conduct hands-on, problemsolving activities or experiments designed to help them explore the topic and make connections to related concepts.

The third phase of the 5Es Instructional Model is **explanation**. The teacher seeks students' understanding using probing questions while students seek clarification of concepts and demonstrate their understanding of the concept or skill. The fourth phase is **elaboration**. In this phase, the teacher helps students understand concepts or ideas in a new light and apply these in another context or situation. The last phase is **evaluation**. The teacher assesses whether or not students are developing an understanding of the concept or topic at hand as well as honing their inquiry skills. The teacher also monitors and evaluates the students' progress at the end of the activity. Students are expected to produce outputs and share them with the class.

The teacher practices critical reflection during the entire teaching and learning process. For instance, after the engagement phase, the teacher reflects and thinks about the questions that should have been asked and addresses the learning gaps in the subsequent phases. After the evaluation phase, the teacher reviews the process and modifies as necessary the teaching approach for the next learning session.

THE IBTL PROCESS FRAMEWORK



SOURCE: SEAMEO INNOTECH

THE PARTICIPATING SCHOOLS IN THE IBTL PHOTO ESSAY

Below are the list of countries and schools where the photo documentation took place. The learning objectives for each domain were documented during classroom observations.

BRUNEI DARUSSALAM

The MOE introduced Sistem Pendidikan Negara Abad Ke 21 or SPN 21 (National Education System for the 21st Century) in 2009. This new education system enables students to face the challenges of globalization in the 21st century by developing 21st century skills such as critical and creative thinking.

Schools/Centers	Age	Subject Areas	Learning Objectives
Sekolah Rendah Kampong Mata- Mata Gadong	7	Science	Investigating healthy and unhealthy food
Sekolah Rendah Panaga	5 to 6	English Language	Producing the sound of the letter "p"
Seri Mulia Sarjana School	4 to 5	English Language	Producing the sound and writing the form of the letter "c"
Stella's School	7	Science	Exploring healthy and unhealthy food

MALAYSIA

The MOE launched the Malaysia Education Blueprint for 2013-2025 in 2012. It recognizes thinking skills which include problemsolving, reasoning, creative thinking, and innovation as part of the six key attributes that students need to be globally competitive.

Schools/Centers	Age	Subject Areas	Learning Objectives	
Sekolah Kebangsaan Jalan 3	5 to 6	Science	ldentifying the basic tastes and parts of the tongue	
	8	English Language	Constructing "what" and "why" questions	
Sekolah Kebangsaan Putrajaya 1, Presint 8	5 to 6	Bahasa Melayu	Combining letters to form words, combining syllables to form words and tracing different letters	

Source: Malaysia Ministry of Education, "Primary School Standard Curriculum," accessed June 24, 2016, http://www.moe.gov.my.

PHILIPPINES

The Department of Education's new K to 12 Basic Education Program started in 2011 with the launching of universal kindergarten and curriculum enhancement of Grades 1 to 7 in 2012. The overall goal of the K to 12 Curriculum is to holistically equip Filipinos with 21st century skills. To achieve this goal, inquiry-based teaching is one of the pedagogical approaches recommended by the Department of Education.

Schools/Centers	Age	Subject Areas	Learning Objectives		
Paaralan ng Buhay ng Maabay	7 to 8	English Language	Forming compound words		
Supervised Neighborhood Play in Muntinlupa City (Smart Tower and Block 10)	3 to 4	Listening Skills	Discovering modes of transportation in the community		

Source: Philippines Department of Education, "K to 12 Features," accessed June 14, 2016, http://www.deped.gov.ph/k-to-12/features.

SINGAPORE

The MOE implemented the Program for Active Learning (PAL) in 2009 upon the recommendation of the Primary Education Review and Implementation (PERI). PAL aims to provide a balance between acquiring knowledge and skills and values development to train children to live in a fast-changing and globalized future. PAL facilitates smooth transition from preschool to primary school education. It is offered to Primary Grades 1 and 2 pupils. PAL is designed to expose students in sports and games, outdoor education, performing arts, and visual arts through hands-on, creative, fun and enjoyable interactive activities.

Schools/Centers	Age	Subject Areas	Learning Objectives
Punggol View Primary School	7 to 8	Outdoor Education	Using senses to investigate signs of life in the garden

Source: Singapore Ministry of Education, "Primary School Education," accessed June 14, 2016, http://www.moe.gov.sg./docs/default-source/education/primary/ files/primary-school-education-booklet.pdf

THAILAND

Thinking and problem-solving skills are explicitly stated in Thailand's Basic Education Core Curriculum as part of the learners' key competencies.

VIETNAM

The Ministry of Education and Training is currently shifting from passive to active learning which aims to develop higher order thinking skills among children.

Schools/Centers	Age	Subject Areas	Learning Objectives	Schools/Centers	Age	Subject Areas	Learning Objectiv
Anubhan Nakhom Pathom	5 to 6	Science	Investigating the effects of planting without sunlight	Dong Da Preschool	4 to 5	Arts and Crafts	Creating artworks using different materials
				Kim Lien Primary School	8	Mathematics	Understanding the
Yooyenwitthaya School	4 to 5	Literacy and Numeracy	ldentifying, naming and counting the ingredients for cooking pumpkin custard				concept of place value of 4-digit numbers
				Vietkids School	5 to 6	Life skills	Simulating different occupations
Source: Thailand Ministry of E October 16, 2015, http	ducation, "B o://academic	asic Education Cor .obec.go.th/web/d	e Curriculum," accessed oc/d/147.	Vietkids School	6 to 7	Vietnamese language	Reading and writing words with 'iêp' anc 'uðp' sounds







ENGAGEMENT

During the engagement phase, the teacher accesses the learner's prior knowledge and experiences. Short activities are conducted to promote curiosity and organize students' thinking toward the learning outcomes of the planned activities. The teacher helps the learners become engaged in a new concept through the use of short activities that promote curiosity and elicit prior knowledge. The activities should make connections between past and present learning experiences, expose prior conceptions, and organize students' thinking toward the learning outcomes of current activities.²

² Bybee et al., BSCS 5E Instructional Model.





Activating prior knowledge and unlocking difficulties using real objects

BRUNEI DARUSSALAM

In this photo, Ms. Arlene Toquero of Seri Mulia Sarjana School shows real fruits such as a pear, orange, apple, and plum to her students (4 to 5 years old) to activate their prior sensory knowledge, i.e., sense of smell, taste, and touch. She asks students to use their senses to describe the scent, shape, and color of the fruits. Ms. Arlene then proceeds to read aloud the story of *Coco the Caterpillar*, which tells of the different fruits that the caterpillar ate. The story was used as a take-off point to introduce children to the sound and form of the letter "c."

Motivating students in the inquiry process using photographs

PHILIPPINES

Ms. Cheryl Gasangan of Paaralan ng Buhay ng Maabay gives a lesson on compound words in the English language. To introduce the concept to eight-year-old students, she flashes photos of two different objects (e.g., horse and shoe), which when combined, form a new word (e.g., horseshoe). Students were later able to give more examples of compound words by combining different photos.





Promoting curiosity through storytelling

SINGAPORE

To stimulate the students' curiosity, Ms. Alison Yili Teo of Punggol View Primary School uses interactive storytelling. Seven- and eight-year old students listen as Ms. Teo narrates the story *We're Going on a Leaf Hunt*. She then asks her students who have previously participated in a scavenger hunt to share their own experiences. By listening to the story and discussing personal experiences about leaf hunting, the students' curiosity is heightened even before the class embarks on its own scavenger hunt.

Connecting students' past and present learning experiences through cooking

THAILAND

Preschool learners (ages five to six) from Yooyenwitthaya School learn about literacy and numeracy through a hands-on activity that entails identifying and counting the number of ingredients needed to cook pumpkin custard. Ms. Sumalee Kathaho asks her students to describe the taste, color, and shape of the ingredients to find out their past knowledge. To connect it to the students' present learning experience, the teacher lets students taste some of the ingredients like sugar. Through this activity, the link between the students' past and present learning experiences is established.





Promoting curiosity through puppetry

THAILAND

To learn about the effects of planting without the benefit of sunlight, students (five to six years old) of Anubhan Nakhom Pathom School are treated to a puppet show. Ms. Kanjan Rojarun uses a stick puppet to tell a story about 'morning glory.' To foster curiosity and trigger discussion about the three basic needs (water, air, sunlight) of plants, Ms. Kanjan asks the guide questions, "Why did the 'morning glory' grow?" and "What do you think will happen if the 'morning glory' did not get sunlight?"

Enhancing creativity using the immediate environment as a topic

VIETNAM

Using local flowers as the theme for the art activity, Ms. Thu Phuong of Dong Da Kindergarten asks her students (four to five years old) which flowers they like best. After the discussion, students proceed to make their own flower artwork.









EXPLORATION

The second phase in the 5Es Instructional Model is exploration. Learners undertake experiments or other activities that help them use prior knowledge to generate new ideas, explore questions and possibilities, and design and conduct research.







Promoting critical thinking through science experiments

BRUNEI DARUSSALAM

To differentiate between healthy and unhealthy food, Grade 2 students (seven years old) of Sekolah Rendah Kampong Mata-Mata Gadong place each food item on top of an oil paper and observe which one will leave a residue. Among the items they tested are fruits, vegetables, butter, bread and chips. Through this process of basic experimentation, students conclude that most food items that secrete oil are unhealthy.



Developing early literacy skills using technology

BRUNEI DARUSSALAM

ECCE students (five to six years old) of Sekolah Rendah Panaga acquaint themselves with the sound of the letter "p" as they go through a group of objects. The teacher cites the name of the object (e.g., paper, paint, pen) and students have to choose and take a photo of objects that start with the "p" (puh) sound using a tablet.











Nurturing curiosity through a taste test experiment

MALAYSIA

In a lesson on basic tastes and parts of the tongue, Ms. Sidi Ahman Shamsiwani of Sekolah Kebangsaan Jalan 3 asks five- and six-year-old kindergarten students, "Which part of the body has the sense of taste?" "The tongue," the students reply in unison. To answer a query from one of the students on which part of the tongue senses the 'good taste,' Ms. Shamsiwani allows her students to try different food items such as sugar, lemon, salted egg, cookies, and coffee. Most students favor the sweet cookies, and many express dislike for lemon because of its sour taste. She guides the discussion by asking, "Which food tasted sweet/sour/salty/bitter?" and refers back to the parts of the tongue.





Discovering modes of transportation through storytelling

PHILIPPINES

Students (three to four years old) in a Supervised Neighborhood Play in Muntinlupa City listen to the story of *Jepoy the Jeepney*. 'Jeepneys' are the most common mode of transportation in the community. The teacher uses the story to gain the interest of the students in exploring other modes of transportation. The teacher asks, "What other modes of transportation do you know?" The students cite airplanes, boats, trucks, and cars.



Discovering nature through a scavenger hunt

SINGAPORE

Grade 2 students (seven to eight years old) of Punggol View Primary School simulate a nature scavenger hunt, an outdoor education activity under the Program for Active Learning (PAL). Students are asked to find specific animals such as spiders and butterflies. They are also asked to find other objects such as something pointy, something beautiful, and something red and green, encouraging them to come up with different answers. Through experiential learning, the students discover that there is great diversity in nature, and that some things and animals, such as butterflies, are mobile and are thus difficult to find or pin down.







Collecting information using technology

SINGAPORE

Students use tablets to take photos of objects and animals that are listed in their nature scavenger hunt.



PHOTO CREDIT: SEAMEO NNOTECH (2016)



Promoting curiosity by planting without sunlight

THAILAND

Students of Anubhan Nakhom Pathom (five to six years old) conduct a science experiment to find out what happens when plants are not exposed to sunlight. Students embed 'morning glory' seeds in the foam, pour water into the tray, and place the foam with seeds in the tray, and cover the same. The teacher asks them to think about the question: "Will the 'morning glory' grow without sunlight?"











Developing literacy and numeracy skills through hands-on activity

THAILAND

Kindergarten students (five to six years old) of Yooyenwitthaya School prepare pumpkin custard in class as part of their lesson on literacy and numeracy. The students are divided into small groups, with each group given a set of letters which they have to use to spell the names of the ingredients (e.g., sugar, milk). The teacher asks each group to spell the words out loud while the rest of the students listen to confirm if the spelling is correct. After the spelling activity, each group is tasked to count and collect the ingredients of the pumpkin custard from the table.



Discovering different occupations through simulation-based learning

VIETNAM

Kindergarten students (five to six years old) of VietKids School are treated to a magic show as part of their lesson on life skills, using different occupations as a theme. The teacher later uses the magic show to introduce the unique occupation of a magician. The students are encouraged to simulate the work of a magician by performing different magic tricks. Through this simulation, the students become more interested and involved in learning the tasks and skills of a magician, and at the same time, have fun doing simple magic tricks.













Promoting creativity through differentiated artworks

VIETNAM

Students (four to five years old) of Dong Da Kindergarten are divided into groups and encouraged to explore and create artworks using different materials such as paint, crayons, colored papers, cotton, and dried leaves and twigs. With flowers as theme, students can choose the art materials they want to use to express their creativity.









EXPLANATION

After engagement and exploration, the next phase is explanation. During this phase, teachers have the opportunity to directly introduce a concept, process or skill. They also seek students' understanding using probing questions. Learners explain or clarify their understanding of the concept. Deeper understanding is achieved through the teachers' explanation.





Developing independent learning through explicit instruction

BRUNEI DARUSSALAM

The teacher instructs four- to five-year-old students of Seri Mulia Sarjana School on the form and sound of the letter "c" as part of their reading lesson for beginners. To develop independent learning, the teacher allows the students to practice writing the letter "c."



Building science concepts through explicit instruction

MALAYSIA

After completing a taste test experiment, Ms. Sidi Ahman Shamsiwani of Sekolah Kebangsaan Jalan 3 discusses the basic parts of the tongue. Ms. Shamsiwani illustrates a human tongue, labelling the parts that recognize each taste, i.e., salty, sour, sweet, and bitter.





Developing critical thinking by seeking clarification

MALAYSIA

After listening to the story of *The Very Hungry Caterpillar*, Grade 2 students (eight years old) of Sekolah Kebangsaan Jalan 3 are given an opportunity to clarify concepts and/or ideas by writing down 'what' and 'why' questions. Some of the questions raised by the students are as follows: "Why were the eyes of the caterpillar big?" "Why did the caterpillar eat so much?" and "What was the name of the caterpillar?" Using these questions, the teacher encourages the students to delve deeper into the story of the caterpillar. She adds some reflective questions as well, e.g., "Do you think the eyes of the caterpillar are big?" "Is it good to eat so much food even when you are full?" and "Why don't we name the caterpillar after the author to give him credit?"









Enhancing analytical skills through inquiry-based reflection

SINGAPORE

After the scavenger hunt in the garden, Ms. Alison asks her pupils to think about what transpired during the activity. Specifically, she inquires if they liked the 'nature scavenger hunt' and encourages them to explain their answers. Students are later asked to write the three things they learned from the activity. At this stage, students ask questions and share their reflections on the 'nature scavenger hunt.' Referring to the task of taking photos using a tablet, some students cite the importance of sharing, taking turns, and working with others.









ELABORATION

The fourth phase of the 5Es Instructional Model is elaboration of knowledge gained by students. During this phase, teachers challenge and extend students' understanding and skills. Students apply new understanding to new problems or another context.





Promoting critical thinking by applying science concepts

BRUNEI DARUSSALAM

Grade 2 (seven years old) students of Stella's School are asked to create a healthy menu after learning the concept of healthy and unhealthy food in a previous lesson. The activity entails selecting and cutting photos of healthy food and drinks, and pasting them in their workbooks.



Enhancing thinking skills by extending students' understanding

MALAYSIA

To reinforce what they have learned from a taste test experiment, five– to six-year-old students of Sekolah Kebangsaan Jalan 3 are tasked to cut photos of food from their worksheets and categorize them according to the four basic tastes (salty, sour, sweet, bitter).





Developing thinking skills by linking students' knowledge to real life

MALAYSIA

Ms. Nurhassin Siti Salbiah of Sekolah Kebangsaan Jalan 3 relates the concept of healthy and unhealthy food, which students learned from the story of *The Very Hungry Caterpillar*, to real-life context. In this photo, she asks students to identify and categorize examples of healthy and unhealthy food mentioned in the story. Students are later asked to give their own examples of healthy and unhealthy food.

Enhancing critical thinking by using new words in another context

VIETNAM

In the Grade 1 class of VietKids School, students (six to seven years old) learn to use the 'iêp' and 'uðp' sounds. Students are taught to read and write new words by combining sounds. They are later asked to use the words in another context following the teacher's example. For instance, one student says he likes making 'tiêp muðp' (invitations) for social events or gatherings.









EVALUATION

The last phase of the 5Es Instructional Model is evaluation. Teachers assess whether or not students are developing an understanding of concept/s. Students produce outputs that they share for classroom discussion.



Assessing group outputs using technology

BRUNEI DARUSSALAM

After identifying and taking photos of objects starting with the letter "p," students (5 to 6 years old) of Sekolah Rendah Panaga are divided into groups and asked to create photo collages using their tablets. The teacher, Ms. Rodzah Binti Awang Angas, connects each group's tablet to the television and asks the class to determine if the group correctly photographed objects that begin with the letter 'p'.

Assessing individual needs through ability grouping

MALAYSIA

Ms. Nor Hafilah Binti Mohammad Khawari of Sekolah Kebangsaan Putrajaya 1 teaches reading in Bahasa Melayu to 5- to 6-year old students. The lesson entails dividing the class into three groups, with each group assigned an ability-based activity and facilitated by a teacher or assistant teacher. In one group (beginners), students trace the outline of plastic letters onto their drawing pads. In another group (intermediate), students are taught to combine syllable cubes to create words. In the final group (advanced), students are actively engaged in the formation of words using Velcro letters.

Through the differentiated group activity, teachers assigned in each group are able to focus on the different levels of assistance that students need based on their skill level. The beginners require more help in identifying and familiarizing themselves with letters. The intermediate students need guidance in pronouncing the syllables. Students in the advanced group, meanwhile, work almost independently.





Developing assessment skills through peer evaluation

SINGAPORE

After taking photos of objects and organisms during the 'nature scavenger hunt,' Grade 2 students of Punggol View Primary School are asked to present in class the photos they had taken. The teacher facilitates peer evaluation by asking other students to verify if the photos presented are included in the scavenger hunt list.

Assessing learning experience through drawing cum reflection

THAILAND

Grade 1 students of Anubhan Nakhom Pathom, aged 5 to 6 years, participate in an experiment that looks into the effects of planting 'morning glory' without sunlight. They are asked to illustrate their reflections on the experiment and share their respective outputs in class. The activity allows students to evaluate and appreciate the learning process and at the same time, hone their creative and critical thinking skills.





Measuring learning gains through game-based activity

VIETNAM

To cap off the mathematics lesson on place value, 8-year old students of Kim Lien Primary School engage in a game facilitated by Ms. Duong Hong Min. In this game, each student must answer multiple-type questions shown on screen by raising the letter card of the correct answer (i.e., A, B, C, D). The teacher selects random students to show their answer and their rationale for this. The teacher then explains the correct answer.

Evaluation of learning gains can be carried out through games and other fun activities. Through educational games, there is an opportunity to generate immediate feedback from the teacher and peers. In addition, students become deeply involved in the evaluation process and their attention is sustained until the end of the lesson.



Developing self-confidence through demonstration

VIETNAM

Kindergarten students (5 to 6 years old) of VietKids learn about the unique work of a magician as the class tackles the theme "different occupations." The teacher coaches the students to do simple magic tricks and after giving them time to practice, students are asked to imagine that they are professional magicians and perform their magic tricks in front of the class. Through this activity, students not only develop their imagination and creativity as 'little magicians' but also become more confident in performing in front of their classmates.







CONCLUSION

This photo essay highlights examples of inquiry-based teaching and learning from the six SEAMEO Member Countries (Brunei Darussalam, Malaysia, Philippines, Singapore, Thailand, Vietnam) included in the study. The photographs illustrate and document how the IBTL approach works in nurturing the creative and critical thinking skills of children aged three to eight years. These pictures depict actual learning exchanges between the teacher and the learners guided by the 5Es Instructional Model or Engagement, Exploration, Explanation, Elaboration and Evaluation.

All the pre-school and primary teachers who participated in the IBTL case study serve as role models, demonstrating how IBTL can cultivate the curiosity of young children and build their creativity and critical thinking abilities. Interestingly, these photographs also capture the initial findings and conclusions of the IBTL study to further improve early childhood education in Southeast Asia.

A well-prepared teacher is the key

The 5Es Instructional Model was originally conceptualized to be used in teaching science. However, this study shows that in selected countries in Southeast Asia, the model is also being used in other domains such as mathematics, language and arts. The importance of the teacher's preparation and planning in inquiry-based teaching and learning was evident in the classes observed during the school visits. The success of IBTL in preschool and early primary grade relies on the teachers' thorough preparation of learning activities, especially the formulation of guide questions that nurture the critical and creative thinking of students.

IBTL application varies in different contexts

Developing thinking skills as part of the 21st century learning is one of the education goals in all countries where the study was conducted. All participating countries do recognize IBTL as one of the approaches that can be used to develop critical and creative thinking skills among children. However, each country uses IBTL in different ways depending on their context, available resources and existing policies on ECCE. In some countries like the Philippines, IBTL is explicitly stated as one of the pedagogical approaches that teachers should use across all the learning areas under the new K to 12 curriculum.

In Singapore, the Program for Active Learning recognizes the need for having specific hands-on activities for the early primary grades such as outdoor education. IBTL is integrated in PAL programs in primary schools in Singapore. In other Southeast Asian countries, however, IBTL remains as an option for teachers.

IBTL as a learning approach is not easy but actual learning outcomes are amazing

In schools visited by the study, it was observed that IBTL stimulates thinking, encourages children's curiosity, and gives

them opportunities to explore and ask questions. IBTL also fosters imagination when students are allowed to create artworks, spend time outdoors, try different or new things, and extend their understanding of stories in literacy activities. Through simple science experiments, learners develop the habit of investigating and validating the information they encounter. In addition, students learn life skills that can be translated into different contexts.

Socio-emotional skills (e.g., self-confidence, independence) are also honed when students are engaged in the inquiry process. Through collaborative activities, students' interpersonal skills are likewise developed. Encouraging them to make choices and decisions during learning activities can help develop their independence. Moreover, allowing students to think of different solutions to a given problem and giving them opportunities to present their outputs in front of the class can help build their self-confidence.

As a whole, IBTL is seen to help develop the socio-emotional skills together with critical and creative thinking skills of preschool and early grade learners. Critical and creative thinking skills are learning skills that are deemed necessary for the 21st century. These skills, together with communication and collaboration (4Cs), will prepare young children for a better future.³

³ P21 Partnership for 21st Century Learning, "Framework for 21st Century Learning" (2007), http://www.p21.org/storage/documents/docs/P21_framework_0816.pdf.

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