

The World Association of Lesson Studies International Conference 2018

LESSON STUDY IN HONG KONG: A CURRICULUM MANAGEMENT APPROACH



ERIC CHENG ECKCHENG@EDUHK.HK



香港教育大學 The Education University of Hong Kong

Curriculum Reform in HK





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9 GENERIC SKILLS ATTITUDES

VALUES AND

- I. Communications skills
- 2. Critical thinking skills
- 3. Creativity
- 4. Collaboration skills
- 5. IT skills
- 6. Numeracy skills
- 7. Problem-solving skills
- 8. Self-management skills
- 9. Study skills

- National identity
- Responsibility
- Peseverance
- Respect for others
- Commitment
- Trust
- Modesty etc.
- 4 Key Tasks:-
- Moral & Civic Education
- Reading to Learn
- Project Learning
- IT for interactive learning



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Eric Cheng

UIKECIIUNS IN IEACHING AND LEAKNING

- From emphasis on teaching to emphasis on learning
- Emphasis on the provision of suitable LE (Learning experiences)
- Interactive learning
- Use of IT
- Group and collaborative learning
- Self-learning and study skills
- Use of projects
- Use of portfolios
- Reading to Learn
- Life-long and Life-wide learning
- Use of community and society resources
- Increasing reliance on formative assessment



Subject Level Curriculum Management

This symposium presents ways in which pedagogical knowledge can be leveraged through conducting Lesson Study in departmental and school levels for effective curriculum implementation in Hong Kong.



School Level Curriculum Management



Conducting school-level Lesson Study is a knowledge combination process that integrates the explicit pedagogical knowledge created by each subject into school-level explicit knowledge for managing the school curriculum. ate study or research only. publication or further reproduction.

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Four Lesson Study cases that aim to manage curriculum, including metacognitive teaching, self-regulated learning, school-based curriculum in Chinese and English Language for enhancing effective learning.



The Education University of Hong Kong herconditions and challenges for cultivating Lesson Study communities for curriculum

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WALS 2018 BEIJING-**LESSON STUDY** OF TEACHING METACOGNITION & CRITICAL THINKING'

ELCHK LUTHERAN SECONDARY SCHOOL





RATIONALE

STUDENT'S PROBLEM AND CURRICULUM RENEWAL

Secondary Education Curriculum Guide

Draft (May 2017)

Booklet 3

Effective Learning and Teaching:

Developing Lifelong and Self-directed Learners



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- Importance of 21st century ability stated in Curriculum guides
 - Metacognition in self-regulated learning
 - Critical thinking ability
- Knowledge Gap between Curriculum goal and lesson pedagogy

OBECTIVE

AIM OF THE LESSON STUDY

Find out the effective pedagogies that enhance student's metacognition and critical thinking ability

 \circ Research based

 Lesson study as a Platform for knowledge management



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SUBJECTS INVOLVED IN LSS LESSON STUDY IN 2018

- Integrated Science (Biology) (One cycle)
- o Chemistry (One cycle)
- o Biology (Two cycles)
- o Visual Art (One cycle)
- o Chinese History (One cycle)

THEORETICAL FRAMEWORKS

BACEIS Model of Improving Thinking

Hartman & Sternberg (1993), Springer-Verlag



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		Metacognition	Critical thinking
_	Definition	Metacognition is well known as	1. High-order thinking process:
		knowledge about cognition and	Sternberg (1986) defined critical thinking as
		control of cognition (John	'comprising the mental processes,
		Flavell,1979)	strategies, and representations people use
			to solve problems, make decisions, and
			learn new concepts.'
			2. Skill and habit
			Beyer (1984) regard critical thinking as a
			collection of skills that combine analysis
_			and evaluation of information.
	Pedagogies	1. Use self-questioning (Gourgey,	1. Visualize thinking process
		1998).	Four key argumentative critical thinking
		To promote metacognitive	skills in teaching (Kuhn's ,1991)
		awareness (Schraw, 1998)	2. Peer interaction
		2. Use 'Model- Coaching-	Anderson et al (2001)
		Feedback' strategy (Jackie Walsh	
		and Beth Sattes,2013) and	
		Bandura and Walter's theory	
		(1963).	
		To practice metacognitive	
		regulation	
		If the more explicit this modeling	
		is, the more likely it the students	
		will develop cognitive and	
The Education University		metacognitive skills (Butler &	
of Hong Kong Library		Winnie,1995).	
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INTERVENTION AND HYPOTHESIS



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VISUALIZE THINKING PROCESS-STRENGTHEN THINKING FRAMEWORK ACTIVATE PRIOR KNOWLEDGE-RETRIEVE AND CALIBRATE EXISTING KNOWLEDGE

Four key argumentative critical thinking skills in teaching (Kuhn's , 1991)

I) providing evidence for one's own theory

2) envisioning alternative theories



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3) providing counter-arguments, and The Education University of Hong) Icebgtting ary ate study or research only. publication or further reproduction.



3 PEER INTERACTION-

LEARN FROM EACH OTHER BY THINK PAIR SHARE AND GROUP DISCUSSION

 According to the reasoned justification of arguments (Kuhn, 1991), Compared with the control group, Anderson et al (2001) analyzed their findings and concluded that peer interaction can help to promote critical thinking.

They concluded that thinking improved

The Education by guided practice.

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MODELING-COACHING - FEEDBACK

(JACKIE WALSH AND BETH SATTES,2013) AND(BANDURA AND WALTER'S THEORY ,1963)

F 3 I S (B I O L O G Y) F 4 B I O L O G Y

To practice metacognitive regulation



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REQUEST STUDENTS TO UNDERGO SELF-QUESTIONING







METHODOLOGY FOR VERIFICATION

I. Mixed approach

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- Quantitative approach
- Qualitative approach

2. One-Group Pretest- Posttest Design

- 3. Parameters for measurement
- a) Quiz score
- b) Indicators for metacognitive awareness and critical thinking
- Sustained Inhibition of Intuition Response (SIIR) (which relate to inhibitory control in executive function)
- Cognitive Biases Detection (CBD) (which relate to error detection in executive function)
- Use self-questioning (visualized)

QUANTITATIVE APPROACH

- Critical thinkers use system I (fast, less effortful) and 2 (slow, more effortful) during logical reasoning and able to detect biases/ fallacies
- Non-critical thinkers: tend to use system I as they tend to judge by associating existing memory and intuition

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DATA COLLECTION

- I) Record the time for answering through Kahoot! platform to measure the time for thinking
- 2) Questionnaire for thinking slower and detect error

QUALITATIVE APPROACH

 Analyse CBD in terms of the phrase/wordings showing detection of biases

T. 在色彩 5 面、图 (a) 运用 5 南 叙美術 投西、他省 1. 略小问屋 次及用 喻。 层 次 歸 係 到最 喻 冬最克 e 创 两 个 色 篙 例 取 招 钱 是 優 位、至 用 墨 小 推 注 些 前 墨 体 現 出来。图 1 b) 整 例 包 黑 彩 墨 水 价 浅 废 1 运用 1 写 产 化 图 包) 发 搏 墨 了 》 的 保 气 使用 (例 取 5 本 天 云 两 约 俞 景 克 敦 瓷 从 而 码 与 河 的 型 图 (c) 冬 图 1 b) 均 使用 1 墨 色 的 变 化 达 到 3 河 忽县
五、蘇因各學河方面。 唐(1) 运用了局行的方式, 使 附近一物或空灯后众阴嗓引人使日支搜得过度。 (1) 为过了于何的领行各意论人不算感觉到有过与约定 动气力学说。 你是必须在的脚脚脚脚上下它心的知
<u>国门到运用了各市资间不同的资源的公式与时间间的现在</u> <u>国门到运用了各市资间方式、以例辨来及新创方。 或表达马明恒不问等。例本现用还例置、影响不可 形态,让人看到"端、牛丁酮、这两个等。」因以外图的</u>
<u>(1)分别,就是(1),创有自己领人自由要思研,相处因(1)%不</u> (朝)与[\$1], <u>太子徒、调,男问运用,建也和虚之,把</u> 提税,社 黄武为一大图装,有,这头用系统与了"11.55等处-
事务新小小行法 急遽为于因为你的元素 面上的" 运用了多奖到对此于例的第一运用了出品体 研究的特手 E_ 别比较陷阱 这种的多体的对比 就是出第1件
为 <u>用玄朱</u> 通E 创重型, <u>刑御女子使用垂个製类数2~ <u>为随趋性化;(利的成复5,</u>4)间黑件子创<u>药;利进</u> 项内以;(特达)里体系***9、价意些.</u>
#地 ◆ 分析 午 散報 3 許何 2 【Ψ/

DATA COLLECTION

- I) Videotape the classroom teaching and learning.
- 2) Arrange interviews for the teachers and selected student participants
- 3) Analyze student learning scripts
- 4) Transcript data collected



FINDINGS

F3 INTEGRATED SCIENCE(BIOLOGY)

THINKALOUD IN QUESTION ANALYSIS ABOUT ENZYME ACTIVITIES

- Similar critical features of object of learning
- Showed improvement in marks increment (especially for moderate to high achievers)
- Highlight keywords
- Mark Self- asking questions
- Answers were more precise
- Regards as Useful strategies



INSTRUCTION INTERVENTION





Standard score



F4 CHEMISTRY : THINK ALOUD IN VOLUMETRIC ANALYSIS

- Same subject critical features for the object of learning
- Show significant marks percentage increment
- Students were able to think aloud prior knowledge before problem solving

Test 1 (Thest actual) (Thest pair share)		
Tyle suggest three lass prior knowledge	before armsening parations about	
withermethrik: emailyonis		
That optimize	Community, Name your paper	
8 epiler 6	and of inlade	1
B. Marty & and . in star	 Inside 	The following problems are molents' common miniakes.
C - sale rate		Sample 1
C - wide lately a marke		The codest control our line titudions altegation. The titudion smalls are land in the table below:
Q - don't of all in stand		tautes /1 1 1 1
Sugar think the that a		Fund making ton') (21.00 21.00 24.00 24.00
E map of mile		tator and optim") 2.00 3.90 3.10 3.40
		at . Based on the involve reads, calculate a manuality average for the volume of the soliton
Not 3 (Not per Ann) Routes in the series particle. A state carrie of the theory age of departs in the theory of the series of the series of the state of states in the series of the state of states of the series of the series of the states of the series of the series of the states of the series of the series of the states of the series of the series of the in the state of these.	$\begin{split} & \text{initially} < \frac{P(G(x))}{CR_{2}(h(x))} \approx \frac{P(G(x))}{2} \\ & where it is the transmission for any second se$	CATEROTICS STREAM OF THE THE AND A CATERON A
		$ \begin{array}{llllllllllllllllllllllllllllllllllll$
		Nhat prior longuladge is needed? Galling, humber



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F4 VISUAL ARTS: ART INTERPRETATION

- Given interpretation framework
- 68.4% showed Marks increment
- Detect bias significantly
- Most think slower during judgment





DETECTION OF BIAS



Difference in percentage of choosing

SUSTAINED INHIBITION OF INTUITION RESPONSE



F4 CHINESE HISTORY DEBATE

- Requested for preparation for the debate topic
- Given detailed guideline of comparison criteria and construction of debate framework
- Change the debate topic in opposite direction but with same critical features for the object of learning
- Prominent improvement in marks increment, especially the comparison and rebutting dimension (CBD)
- Peer learning was significant in the debate The Education University

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F4 BIOLOGY CONCEPTUAL CONFLICT DURING JUDGING MISCONCEPTIONS

- No significant change in SIIR and CBD
- Various problems in prior knowledge and answering skills were found by student's script analysis



KAHOOT!



CODING OF STUDENT'S SCRIPT

F4 BIOLOGY



MISSING/ **INCORRECT PRIOR** KNOWLEDGE (LESSON TWO)

When light intensity

creases, the increase

dure is the ing factor to speed u

「當光強度増加 時,還度上升是主要加快装置(

Task 1 Scenario Judament

of 1 ate stu

Not fo

To investigate the effect of light intensity on transpiration rate without effect of light intensity



A weight photometer, a table lamp a container filled with water



SCRIPTS ANALYSIS (LESSON THREE): **PRIOR KNOWLEDGE IS THE FOUNDATION FOR JUDGEMENT**

		Missing/ Unable to retrieve/	
		Unassimilated prior knowledge	Further prior knowledge
		Absence of cuticle on surface of root (structure)	Low solubility of oxygen in water
		The relation between size of organisms and	
	John's	diffusion distance	
	view	The structures of plant, especially stem and root	
	Susan's	The need for water gain in turgidity.	Amount of water uptake from soil.
	view	Excessive water loss occurs in herbaceous plant.	
		The impermeable layer of root exposed to air	No diffusion occur for solidified concrete
		and bark of stem.	molecules.
			Concrete molecules are too large to pass
	Tom's	The position of xylem in stem and root.	through cell membrane or cell wall.
	view	The small size of pores of cell membrane.	
		Needs of oxygen for active transport during	
The	Educ	mineral uptake	The small air space between soil particles.
CTT.	Lauci	atton Oniversity	Movement of undried concrete molecules
of H	o Magy 🔣	No cuticle is govered on the root surface so	down the soil surface and fill up the air
o etur	view	oxygen in soil air can diffuse into root hair.	space.
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blica	tion or	further reproduction.	

OVERLOOK QUESTIONS (LESSON ONE)



REFLECTION FROM STUDENTS: HEURISTIC IN MINDSET

I. Sustained Inhibition of Intuition Response (SIIR) (which relate to inhibitory control in executive function)



2. Cognitive Biases Detection (CBD) (which relate to error detection in executive function)

SECOND CYCLE OF BIOLOGY LESSON Study

FINDINGS

- For judging concepts, think aloud by students cannot help as their prior knowledge is wrong/ incomplete.
- worthy to request students to visualize their thinking as the missing or wrong knowledge can be realized and fixed up.



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SUGGESTIONS

- The metacognitive skill and critical thinking skill learnt is domain specific even in same subject if the knowledge/ object of learning is different.
- instructors are suggested to model and facilitate the think aloud prior knowledge/ critical features of the object of learning through asking student's questions. During which, the misconception and missing prior knowledge can be calibrated.

IMPACT 1 Sharing of Knowledge

- Importance of solid prior knowledge before judging
- More modeling, practices and guidelines for how to think of the self-asking questions
- More time is needed/ Deepen discussion by adopting two views and rebutting between groups
- Group discussion dominated by wrong idea
- More scaffolding is needed for thinking

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IMPACT 2: Knowledge creation

① ENHANCING COGNITIVE AND BEHAVIORAL STRATEGIES (RELATE TO WORKING MEMORY CAPACITY)

ERTMER & NEWBY(1993/2013)



FIGURE 1. COMPARISON OF THE ASSOCIATED INSTRUCTIONAL STRATECIES OF THE BEHAVIORAL COGNITIVE, AND CONSTRUCTIVIST WEMPOINTS BASED ON THE LEARNER'S LIVEL OF TASK KRONLEDGE AND THE LEVEL OF COGNITIVE PROCESSING REQUIRED BY THE TASK.

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- Strengthen prior knowledge consolidation
- Design more detailed guidelines and visualization for less able students
- 3) Mastery learning of knowledge and skill

© ENHANCING VALIDITY

I) COMPARE WITH STUDENTS IN HIGHER FORM



- 2) More data collection
- Administrate questionnaires for metacognition
- 4) Set rubrics for behavioral change showing metacognitive awareness
- Design questions to arouse metacognitive awareness and regulation
- 4) Focus on moderate students

IMPACT 3: Student's acknowledgement

- S1: We should stop and think alone then discuss with the groupmate to rethink my decision is correct or not.
- S2: Critical thinking ability can help to find the fallacies of other's saying. Always find evidence to support my claim and this can help to learn and consolidate knowledge.
- S3: It's important to critique my thinking because I won't judge during answering a question, just think it's right. If I learn this, it's useful for me to identify whether it is a true or false answer.
- S4: To stop and think first. Not to judge the answer by intuition. Also, read more books and learn more knowledge if you have a lot of things you don't know.
- S5: Stop and think clearly
- S6: Stop and think twice before answering the question and judge my decision is right or wrong.
- S7: Double everything. This can help me to find out the mistake I have made or to judge whether the claim of others is correct or not.
- S8: Stop and Think. You can think the answer in more ways that can expand your original answer.

S9: Stop and think. It can help me to clam down and can think about the question in more angles.

S10:That we need think carefully before answering or telling it to others. Find proof or evidence.

SII: Stop and think. Because it can help me to think more about he question and the question what want us to answer.

S12: Stop and think more about the questions. To think more ways to solve the problems The Education Stiget inderstand need to think before doing question and use more angles to think, and of Hong Kong Librarthen relate biological knowledge to my daily life knowledge together.

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COMING: RECONSTRUCT MODEL OF THE PEDAGOGY



LESSON STUDY IS.. 1. A VERY POWERFUL TOOL FOR PROFESSIONAL DEVELOPMENT AND KNOWLEDGE MANAGEMENT 2. A VERY VALUABLE TEACHING AND LEARNING IMPROVEMENT EXPERIENCE





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VISION FOR FUTURE

	Interschool sharing in HK	
Promote lesson		International sharing
studies practices	Facilitate Knowledge Management in teaching and learning	Enhance Professionalism of teaching

Two critical success factors:

Need connections through Hong Kong Learning Circle Association

The Education University Professional advice from University



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THANKYOU FOR YOUR PROFESSIONAL ADVICE!

