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Being and Becoming Even Better Teacher Professionals in Today's Digital Age

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2 Thoughtful Questions for Today

To become even better teacher professionals in today's digital age,

- **what philosophy should teacher professionals adopt towards PD? &**
- **what knowledge & skills should they equip themselves with?**

1st Thoughtful Question

To become even better teacher professionals in today's digital age, what philosophy should teacher professionals adopt towards PD?

Teacher Ownership, Teacher Leadership (TOTL)

The philosophy of TOTL conveys the idea of

teachers as professionals,

- having the **agency and autonomy in their own learning**,
- as well as **leading**, **supporting and contributing** **to the learning of other teachers.**

(Harris, 2005; Spillane, 2005)

References:

Harris, A. (2005). Teacher leadership: More than just a feel-good factor? *Leadership and Policy in Schools, 4*(3), 201-219.

Spillane, J. (2005). Distributed leadership. *The Education Forum, 69*(2), 143-150.

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TOTL in 2 types of Learning Communities

Type 1: Professional Learning Community (PLC) - Learning community within school

Type 2: Networked Learning Community (NLC) - Learning community across schools

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Professional Learning Communities (PLCs)

(Dufour, 2004)

Three Big Ideas

- Big Idea #1: Ensuring That Students Learn
- Big Idea #2: A Culture of Collaboration
- Big Idea #3: A Focus on Results

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Professional Learning Communities (PLCs) (Dufour, 2004)

Four Critical Questions

1. What do we want our students to learn?
2. How will we know they are learning?
3. How will we respond when the students do or do not learn?
4. How will we extend the learning for students who are already proficient?

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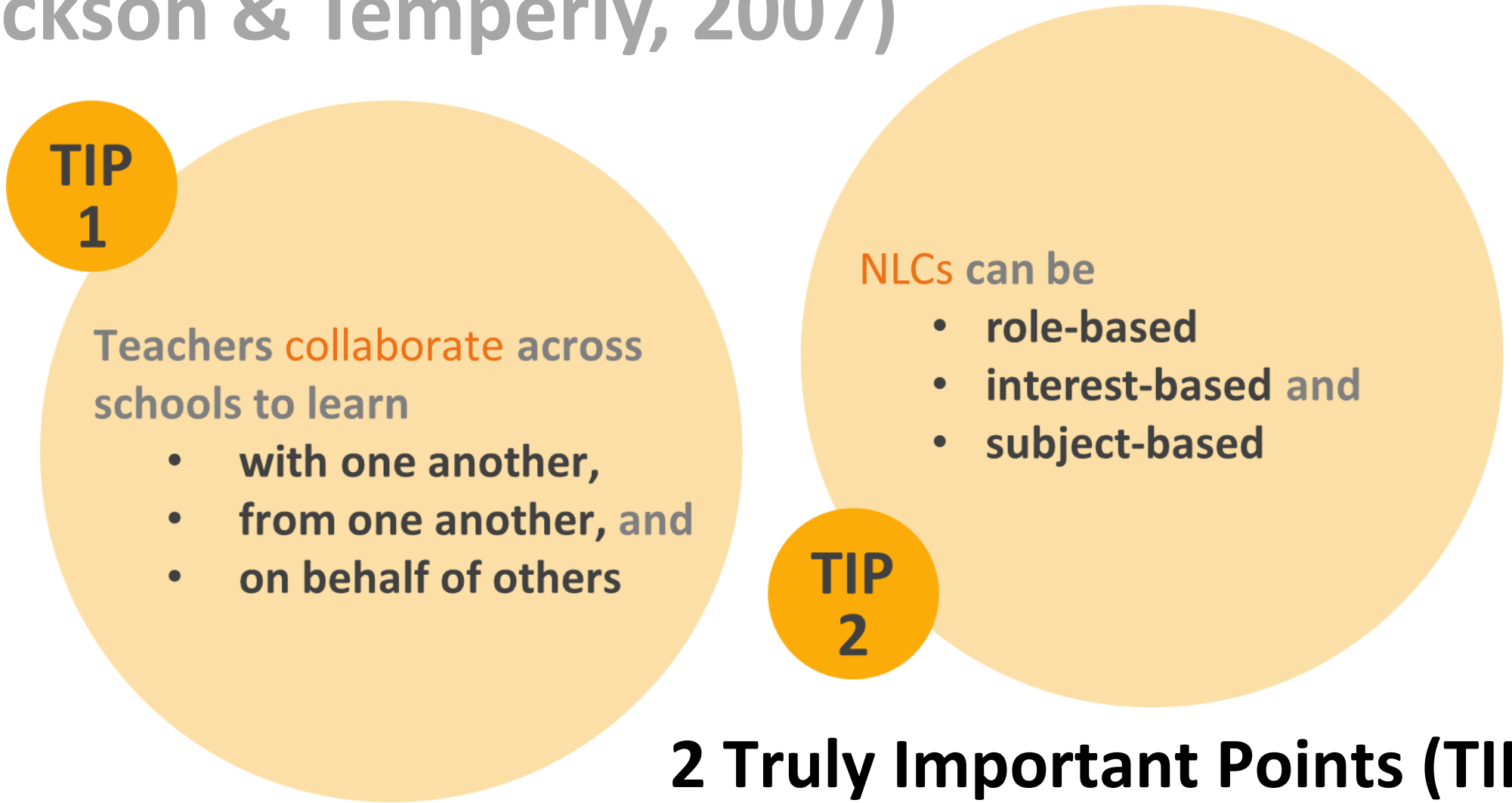
Networked Learning Communities (NLCs)

(Jackson & Temperly, 2007)



2 Truly Important Points (TIPs)

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2nd Thoughtful Question

To become even better teacher professionals in today's digital age, what knowledge & skills should they equip themselves with?

Activity (3 min)
(Polling Time!)

Question

Which video do you think is a more effective introduction to the concept of "system" for Year 4 students (10 years old)?

Teaching the concept of "System" to Year 5 to 7 students

Video Clip 1 (30 sec)

Video Clip 2 (43 sec)

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Activity (3 min)
(Polling Time!)

Question

Which video do you think is a more effective introduction to the concept of "system" for Year 4 students (10 years old)?

Answer

It depends on the SPIN of the students:
Strengths,
Prior knowledge,
Interests & Needs

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Teaching the concept of "System" to Year 5 to 7 students

Video Clip 1 (30 sec)

Video Clip 2 (43 sec)

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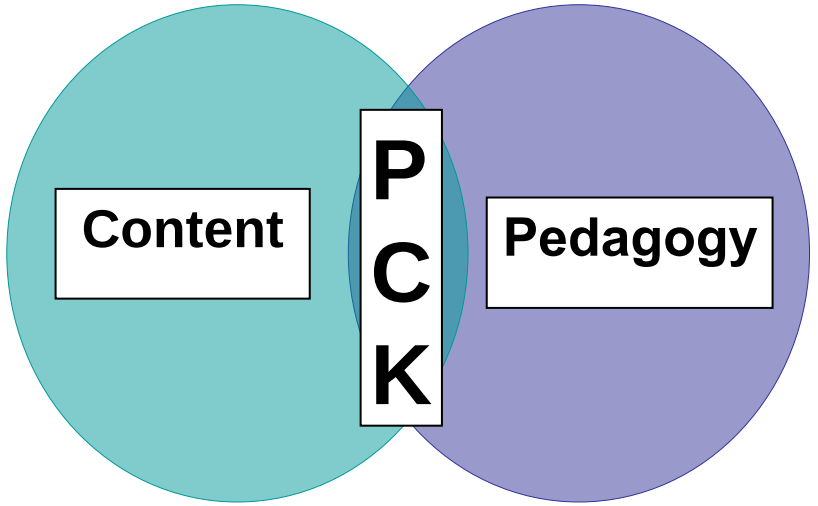
History and Development of Pedagogical Content Knowledge (PCK)

As a domain of teacher knowledge,

PCK is the blending of content & pedagogy

(Shulman, 1987)



Professor Lee Shulman

Charles E. Ducommun Professor of Education Emeritus, Stanford University &
President Emeritus, The Carnegie Foundation for the Advancement of Teaching

PCK is what makes a teacher a teacher!

Truly Important Points (TIPs) in the History and Development of PCK

TIP 1

Content (What) and
Context (Who & Where)
shape
Pedagogy (How)
for
Quality Teaching

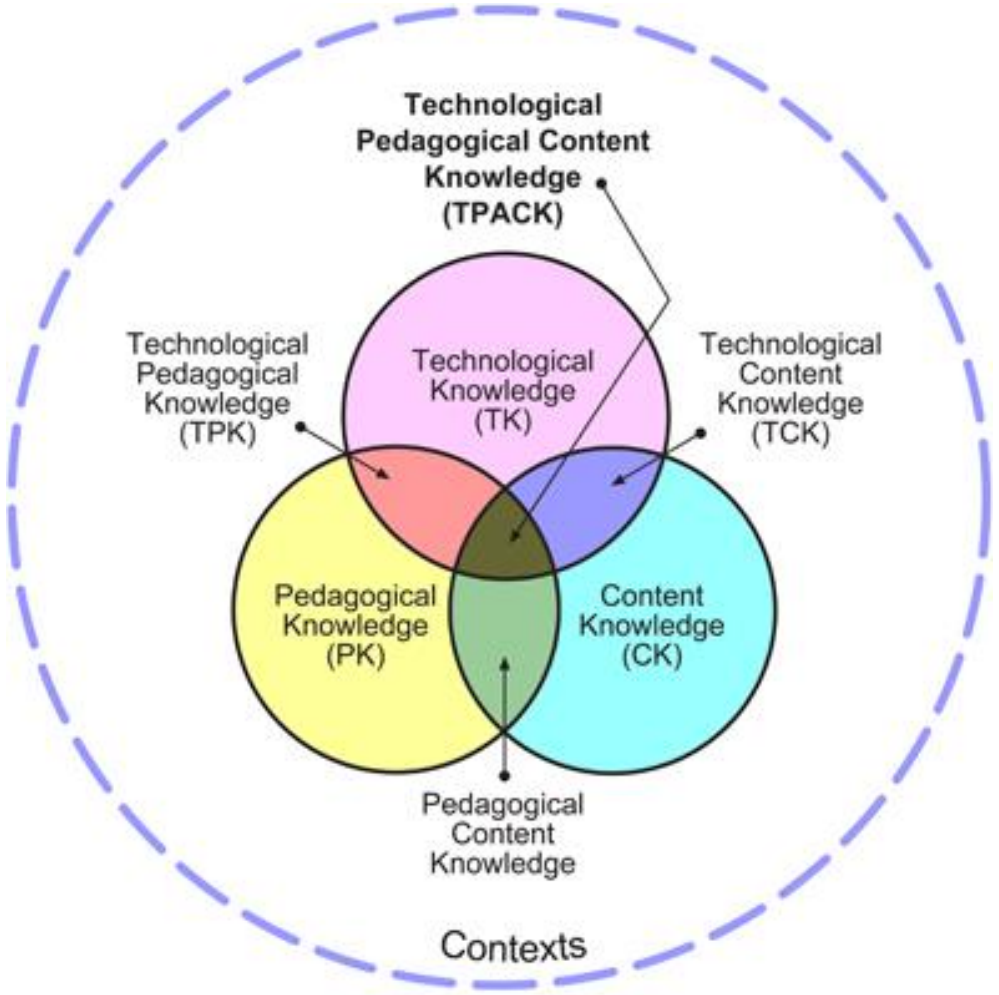
Important Question

What is the role of Technology in PCK?

Teacher Beliefs and Use of Technology

In the context of **use of technology for T&L**, research study by Tay et al. (2017) has highlighted that **while teachers believe that technology has a role in T&L**, there is a need for them to **harness technology as a pedagogical tool beyond using it as a productivity tool.**

Technological Pedagogical Content Knowledge (TPACK) by Mishra & Koehler (2006)



Addition of Technological Knowledge into the PCK Framework

Quality teaching requires developing a nuanced understanding of the **complex relationships between technology, content, and pedagogy**, and using this understanding to develop appropriate, context-specific strategies and representations.

(Mishra & Koehler, 2006)

Truly Important Points (TIPs) in the History and Development of PCK

TIP 2

Content and Context

shape

Pedagogy

enabled by

TECHNOLOGY

for

Quality Teaching

PCK in the Digital Age: Technology as a powerful enabler

Enabling connections – preparation for teaching (pedagogical content knowledge) including:

- selecting appropriate resources and methods to enable students to make connections between prior knowledge and developing subject knowledge;
- transforming existing knowledge into teachable content;
- enabling opportunities for students to create, critique and share knowledge;
- enabling connections between groups and individuals to develop knowledge of the subject;
- adaptation and tailoring (personalising) learning for the students being taught.

Source: Pedagogical reasoning and action in the digital age (Starkey, 2010)

2nd Thoughtful Question

To become even better teacher professionals in today's digital age, what knowledge & skills should they equip themselves with?

PCK in the digital age with Technology as a powerful enabler

Anything else?

A rare privilege to host Prof Lee Shulman at the Singapore International Science Teachers' Conference 2019

2nd Thoughtful Question

To become even better teacher professionals in today's digital age, what knowledge & skills should they equip themselves with?

(1) PCK in the digital age with Technology as a powerful enabler

(2) e-Pedagogy

Big Ideas in e-Pedagogy

What is e-Pedagogy?

e-Pedagogy is the

practice of teaching with technology for active learning

that creates a more

participatory, connected & reflective classroom

to nurture the

***future-ready learner*.**

Reference

Introduction to e-pedagogy | sgEdTech Blog (sgedtech.blogspot.com

Big Ideas in e-Pedagogy

Here are the
4 elements of e-Pedagogy!

Element 1: Constructive Alignment

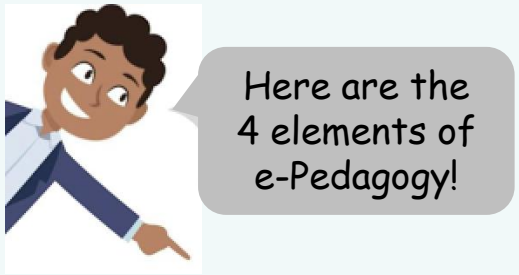
Element 2: Active Learning Processes & Learning Interactions

Element 3: Key applications of Technology (KAT)

Element 4: Learning Experiences

Reference

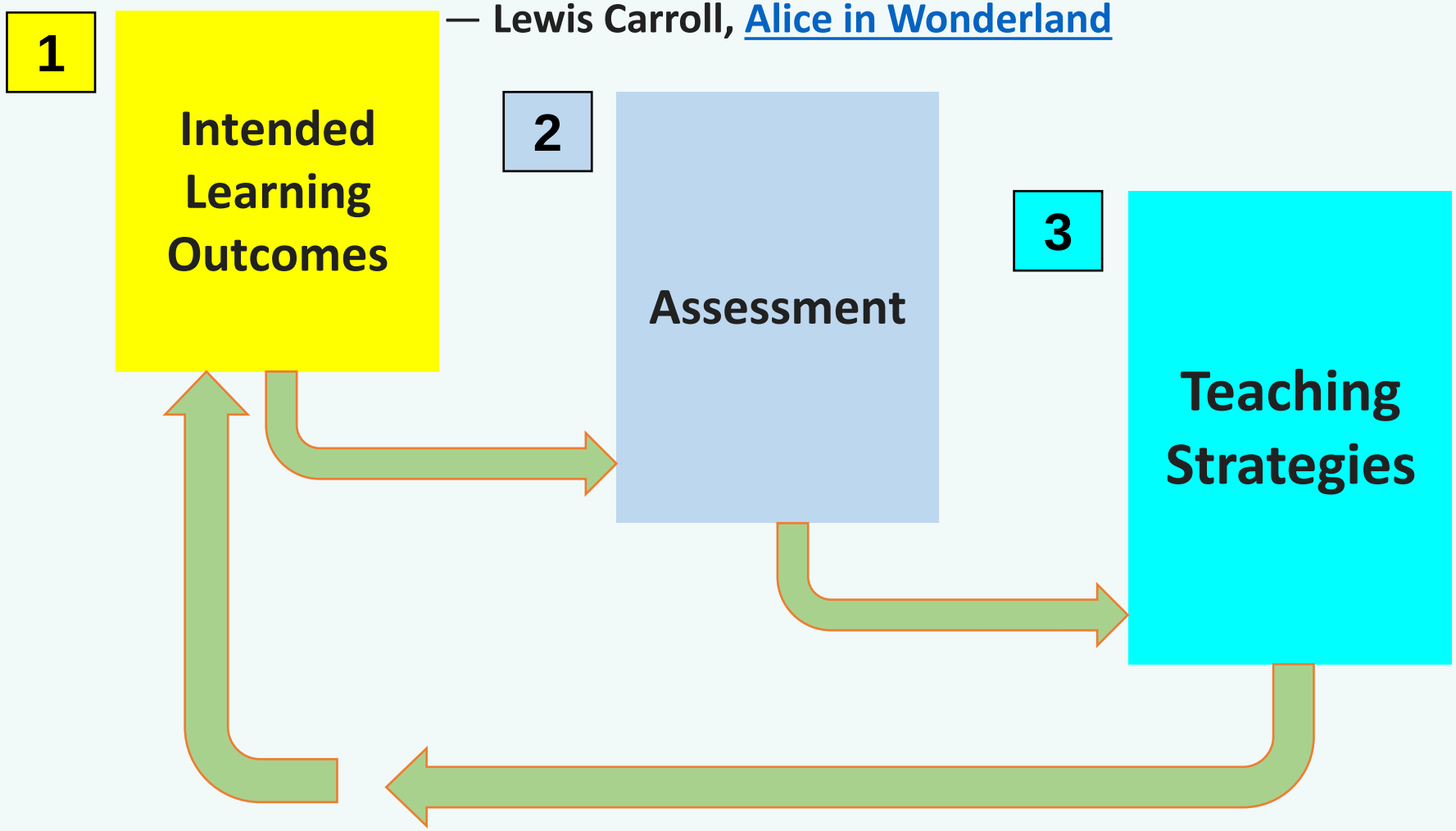
Introduction to e-pedagogy | sgEdTech Blog (sgedtech.blogspot.com



Element 1: Constructive alignment

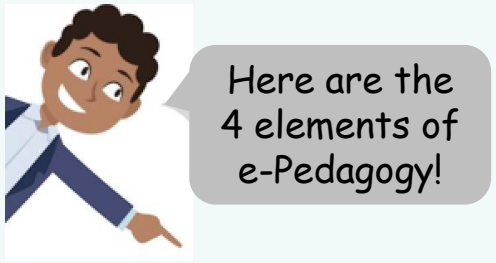
"If you don't know where you are going, any road can take you there"
— Lewis Carroll, Alice in Wonderland

Alignment between the 3 components for instruction



Reference:

Using Biggs' Model of Constructive Alignment in Curriculum Design/Introduction - UCD - CTAG (ucdoer.ie)



Element 2: Active Learning Processes & Learning Interactions

Research has shown that
Learning interactions
are at the heart of
active learning processes,
where the focus is on how students are learning with teachers, peers, community and resources.

THURSDAY, SEPTEMBER 24, 2015 | THE STRAITS TIMES | HOME

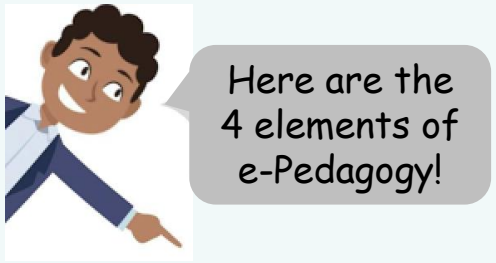
Fifteen-year-old Cai Bingfeng twirls a washing machine drainpipe during a demonstration class held yesterday at the newly set up Centre for Teaching and Learning Excellence at Yusof Ishak Secondary School. ST PHOTO: MARK CHEONG

Quiz 1 (1 min)

In the photo shown, can you spot 3 out of 4 learning interactions?

Reference

https://www.nie.edu.sg/docs/default-source/default-document-library/36156714.pdf?sfvrsn=23733bb3_0

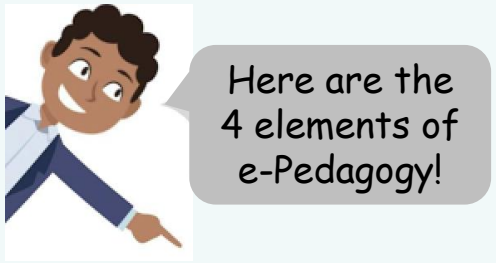


Element 2: Active Learning Processes & Learning Interactions

Examples of Active Learning Processes (ALPs) include:

1. Activate learning
2. Promote thinking & discussion
3. Facilitate demonstration of learning
4. Monitor & provide feedback

Home-Based video clip on Energy, System & Interactions



Element 3: Key applications of Technology (KAT)

Key Applications of Technology (KATs)

What affordances of technology can be harnessed to enhance the learning processes.

Quiz 2 (1 min)

If technology is defined as any "tool" a teacher uses to convey the lesson or interact with students, can you name the types of technological "tools" shown in the photo?

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Reference

https://www.nie.edu.sg/docs/default-source/default-document-library/36156714.pdf?sfvrsn=23733bb3_0

ICT-Integrated Physics Instruction

Table 4.7 Pedagogical Affordances of Technology in Physics Instruction **General & Specific)**

Use of Technology (General)		
Pedagogical Affordance (Why & How)	*Technology (What)*	
Formative Assessment	Classroom response system, online survey	
Communication	Word processing, desktop publishing, presentation software, email	
Collaboration	Web 2.0 tools	
Access to real-world scientific data	Internet websites and databases	
Use of Technology (Specific)		
Pedagogical Affordance (Why & How)	*Curriculum (Where)*	*Technology (What)*
Multiple-linked representations	Constant velocity or constant acceleration 1D motion, simple harmonic motion	Simulations and modeling, Datalogging software, video analysis software
Dynamic modelling		Simulations and modelling
Data collection, analysis and presentation	Electromagnetic induction IV characteristics	Datalogging, spreadsheets

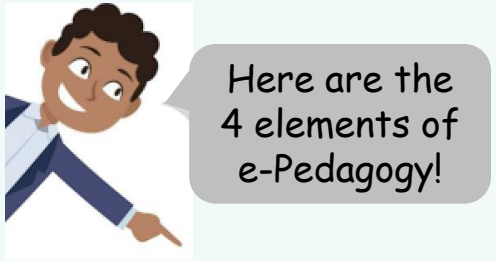
Examples of Web 2.0 tools:

Mentimeter, Kahoot, Jam Board …

Curriculum shapes Pedagogy enriched/enabled by Technology

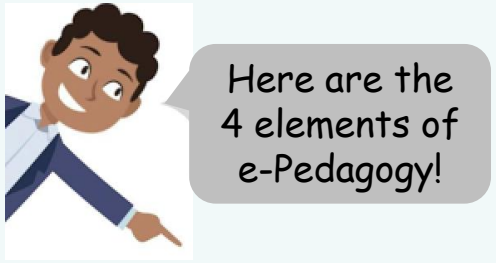
Reference:

Wong, D. (2011). Strategies for inquiry-based physics instruction. In C.Y. Lau, J. S. Wong, M. K. Chew, & K. S. Ong (Eds.), Handbook for Teaching Secondary Physics (pp. 34-48). Ministry of Education, Singapore.



Element 4: Learning Experiences

What is a research-informed Learning Experience that is applicable to all subjects?



Element 4: Learning Experiences

What is a research-informed Learning Experience that is applicable to all subjects?

Inquiry-Based Learning (IBL) !

Concluding Thoughts…

2 Thoughtful Questions for Today

To become even better teacher professionals in today's digital age,

- what philosophy should teacher professionals adopt towards PD? -- **TOTL**

- what knowledge & skills should they equip themselves with? – **PCK & e-Pedagogy**

Clarion call of Teachers to take personal ownership and leadership in Continual Professional Development

"Continual PD is a never ending journey of growing the being and doing of teachers to become

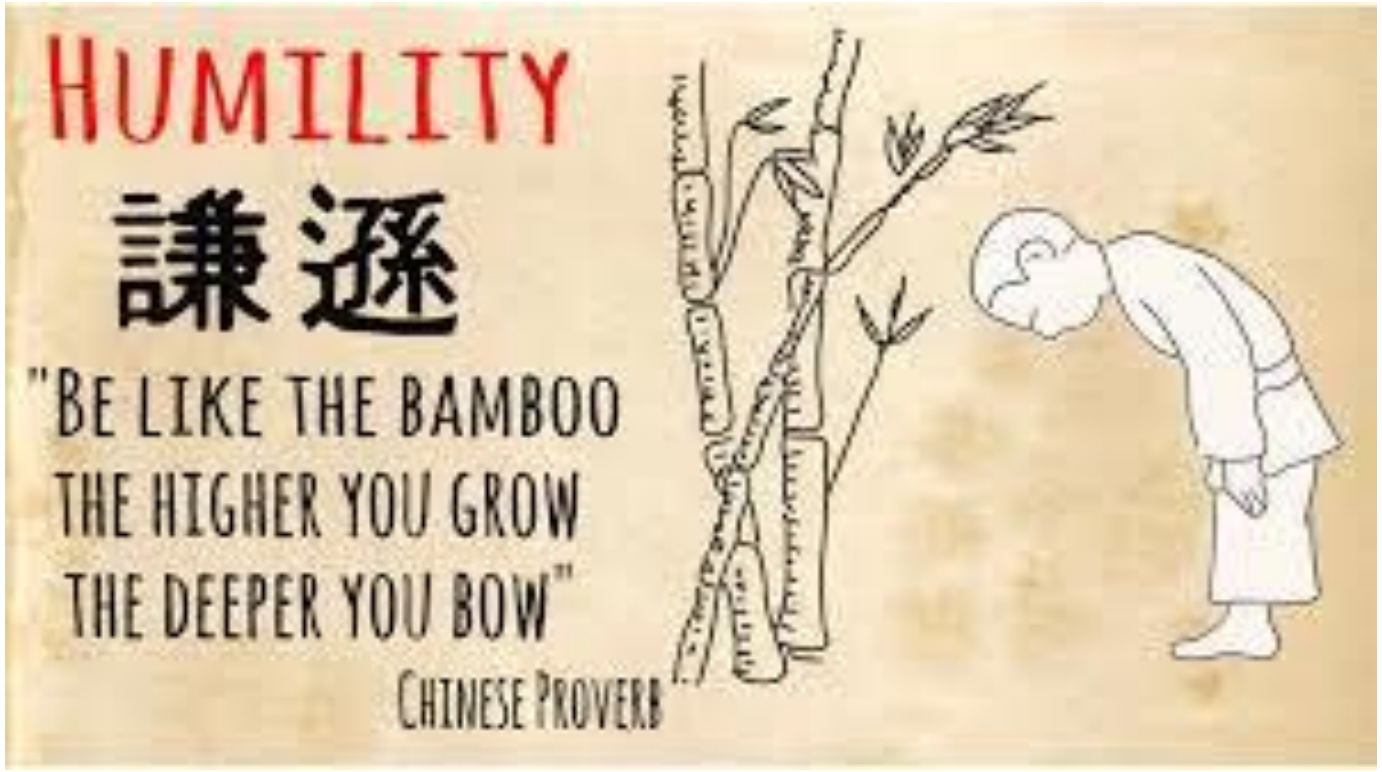
even better

teacher professionals

for their students"

Being precedes Doing ⟷ Doing shapes the Being

“If I have seen further than others, it is by standing on the shoulders of giants.”
-Isaac Newton, English mathematician, physicist & astronomer



“The more I learn, the more I realize that I don’t know.”
-Albert Einstein, German Physicist & Nobel Prize Winner

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Thank you

Any Questions?

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