Technology-Enhanced Learning:

It is about time… to start

Angkee Sripakagorn

Engineering Education Initiative

Faculty of Engineering, Chulalongkorn University
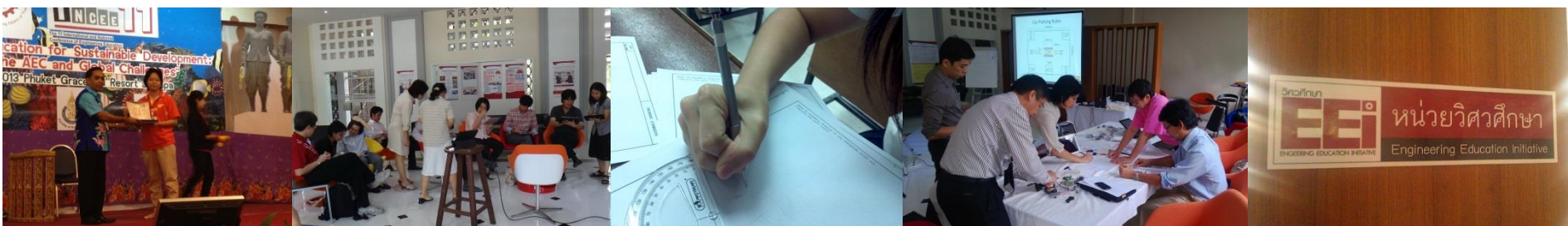
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Contact: angkee.s@gmail.com

Engineering Education Initiative

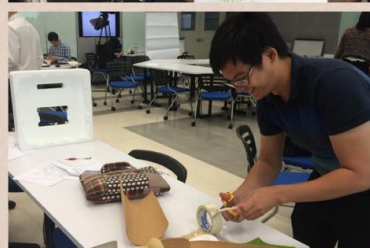*Community of Practice*

Research-based

Strive for excellence in Engineering Education   *Since 2011*

Internal training & Research

Develop new courses & facility

Training, Workshop & Consultation

- Active Learning
- Flipped Classroom
- Flexible classroom design
- Innovation/Design thinking

Engineering school & TEL?

- ✓ **L**earning**M**anagement**S**ystem – Mycourseville.com
- ✓ Active learning classroom – *i* $S_{tudent}C_{entered}A_{ctive}L_{earning}E_{xperience}$
- ✓ **P**ersonal**R**esponse**S**ystem – Clicker
- ✓ MOOC – mooc.chula.ac.th

But also

- ✓ Still trying to adapt/adopt TEL to the benefits of our students

Topics today:

★ **The needs for TEL**   ★ **Muddy points about TEL**

★ **Challenges in implementing TEL**

The needs for TEL

Aging population:= new **Demographics of students**

# of children drops = # of Students drops

Longer working life = nontraditional students

(elders + current workforce in need to retrain for new job requirements)

Need added *flexibility*

Smart phone society:= new **Learning environment**

Students are digital natives. Tech is woven into their lives.

Note: no finger pointing to "Gen Z"

Need Pedagogy that keeps *engagement*

Ubiquitous communication vs Classroom engagement.

Teachers – competing against screens of various sizes.

Students – also learned to shut out "irrelevant" inundated info from their channels.

(*But allowing digital devices in the classroom is not considered "TEL either!"*)

The needs for TEL

Innovation society = new normal of **Economics of Higher Education**

an innovation society where **knowledge is utilized** *rapidly and powerfully for societal benefit and development.*

Conventional model of Higher Education		*New expectation*
Knowledge creation	: University	Co-creation
Knowledge dissemination	: Book, Lecture	*Deep learning, Life-long learning*
Expectation from learners	: pass Exam	*21st century skills*

The needs for TEL

Innovation society = new normal of **Economics of Higher Education**

Deep learning – ability to apply knowledge and skills in real-world contexts + to demonstrate proficiency via authentic performances.

Life-long learning – Knowledge's half-life gets much shorter. Need skill & mindset to unlearn/relearn

21st century skills – more than knowledge, students need essential skill sets.

Cognitive Outcomes	Intra-personal Outcomes	Inter-personal Outcomes
Cognitive processes &	Intellectual openness	Teamwork &
Knowledge	Work ethic &	Leadership
Creativity	Positive core self-evaluation	Communication
Critical thinking	Metacognition	Responsibility
Information literacy	Flexibility	Conflict resolution
Reasoning	Initiative	
Innovation	Appreciation of diversity	

Need Efficacy to keep up with content Knowledge

"a 21st century view of learner success requires students to not only be thoughtful consumers of digital content, but effective and collaborative creators of digital media, demonstrating competencies and communicating ideas through dynamic storytelling, data visualization and content curation."

The needs for TEL

Added Flexibility: *Aging population*

Pedagogy that keeps engagement: *Smart phone society*

A chance to keep up with content Knowledge: *Innovation society*

*Hence, the need for **Enhanced Learning** with the help of **Technology***
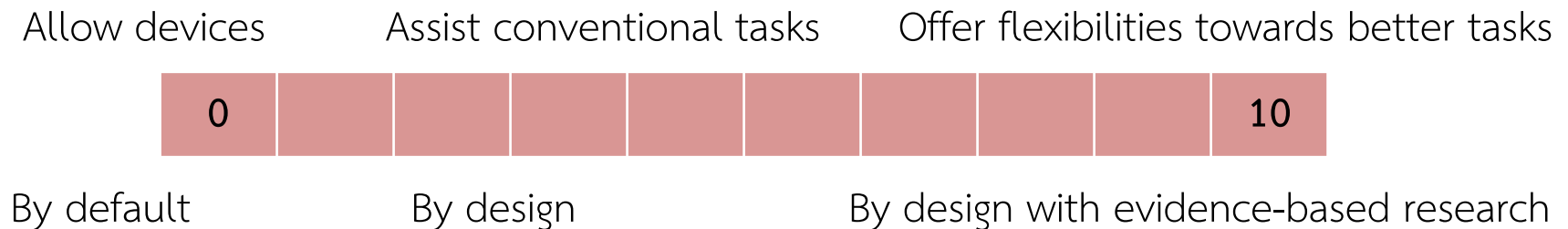
Muddy points: Haven't we started?

TEL: The use of ICT to support learning [1]   aka. **e-learning**

to give students **flexibilities** in **Place / Pace / Mode***

- Place – e.g. work-based learning
- Pace – e.g. part-time, accelerated learning, personalized pathway
- Mode – e.g. blended learning

Forms: MOOC, mobile-learning, Courseware, gamification

Spectrum of TEL usage:

Allow devices   Assist conventional tasks   Offer flexibilities towards better tasks

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By default   By design   By design with evidence-based research

* Flexible Pedagogies: technology-enhanced learning , The Higher Education Academy (2014)

Muddy points : Should we start?

New things come with a dread.

"Students depend too much upon ink.

They no longer know how to use a knife or sharpen a pencil."

(National Association of Teachers, USA, 1907)*

Anything always has *Pro* and *Con*.**

Pro:

Allow experimentation & instant feedback

Ensure full participation

Make learning more fun and effective

Automate tedious tasks

Allow Instant access to fresh information

Help to learn life skill - Tech

Con:

Distractions

Disconnect from social interactions

Foster cheating in class and on assignments

Unequal access to devices

Quality of information - dubious

Class planning - can be labor intensive

Worst case scenario is... *sitting still*.   **How to avoid Cons – *deal with challenges*.**

* Conditions for Technology Enhanced Learning and Educational Change: A case study of a 1:1 initiative. Marcia Håkansson Lindqvist , Umea University, 2015

** https://tophat.com/blog/6-pros-cons-technology-classroom/ published: March 2015

Challenges in Implementing TEL   (1) Faculty members

Stigma in adopting TEL (for the first time)

Basics: Learning is a complex process. Faculty are not trained in learning science.

The effort in adopting TEL can be overwhelming.

Failure at the first attempt is common.

Insight:

Intuitive approach in adopting TEL often leads to poor results.

Adopting research-based methodology also deemed overwhelming.

Institutions *need to*

- Insist on TEL based on evidence-based, data driven Learning Design.

- Support resources and incentives to enable such Learning Design

  - hence foster not only initiative (and innovation)

  - But also iterations (and continuous improvement). (accept failure, min. one-off attempt)

Challenges in Implementing TEL   (1) Faculty members

Stigma of Teaching Technique Workshop

Basics: Faculty are primarily trained for their disciplines.

Hence, training in learning science are provided – workshops, recess, e-learning.

Insight:

The quality of training programs are often hit-and-miss and not of high quality.

For busy academia, the need for learning science is at the moment when the faculty attempt to implement/design learning in face of reluctant peers or/and skeptical administrators.

The valuable learning science draws on resources not available from googling.

Times and again, it is not about learning new skills, but also about unlearn common beliefs, unconscious values about teaching and learning.

Hence, *the most effective support is just-in-time guidance or mentoring with high levels of emotional/social support.*

Challenges for Implementing TEL (2) Institution

Skepticism on TEL

Basics: Anecdotal evidences point to dubious results of T in EL.

Insight:

Not to ask "*if TEL is effective*".   It is similar to asking "*if book is effective*".*

Indeed, TEL is an empowering factor rather than an essential element in itself.

Look beyond the present.

Look for transformative changes in students' learning.

And **ask...**

If [*Deep learning*] happens, *what % of students benefit from this?*

If [*Life-long learning*] happens, *how efficient is this compared to what we offered previously.*

If [21stcentury skills] is achieved, *how much more proficient students will be in the workplace.*

*With the shared vision and the urgency, TEL will **emerge as a potent catalyst for changes.***

*The Role of Digital Learning in Asia's Educational Future, The HEAD Foundation (2016)

Challenges for Implementing TEL (3) Biz model of Higher Ed

Potential Risk from TEL

Basics: Once flexibility is offered by TEL, key KPIs could change drastically.

retention, # success rate.   Potential risk to Image and Ranking.

Insights: By embracing nontraditional students in today's innovation society, TEL has created a new business model for Higher Education.

Shifted roles:

K creation ➔ K curation (search, sift, organize)

K dissemination ➔ Learning coach

➔ Define competencies necessary for students

➔ Redefine traditional disciplines that can be developed (K+competencies) through learning experience

With TEL, not that Faculty is replaced.

But with us *doing the same old thing*, they will **not succeed**.

Without us, they will **not succeed either**.

That's why we are important, 55.

In turns, this way, Higher Education as well as the faculty are kept in the loop of societal development.
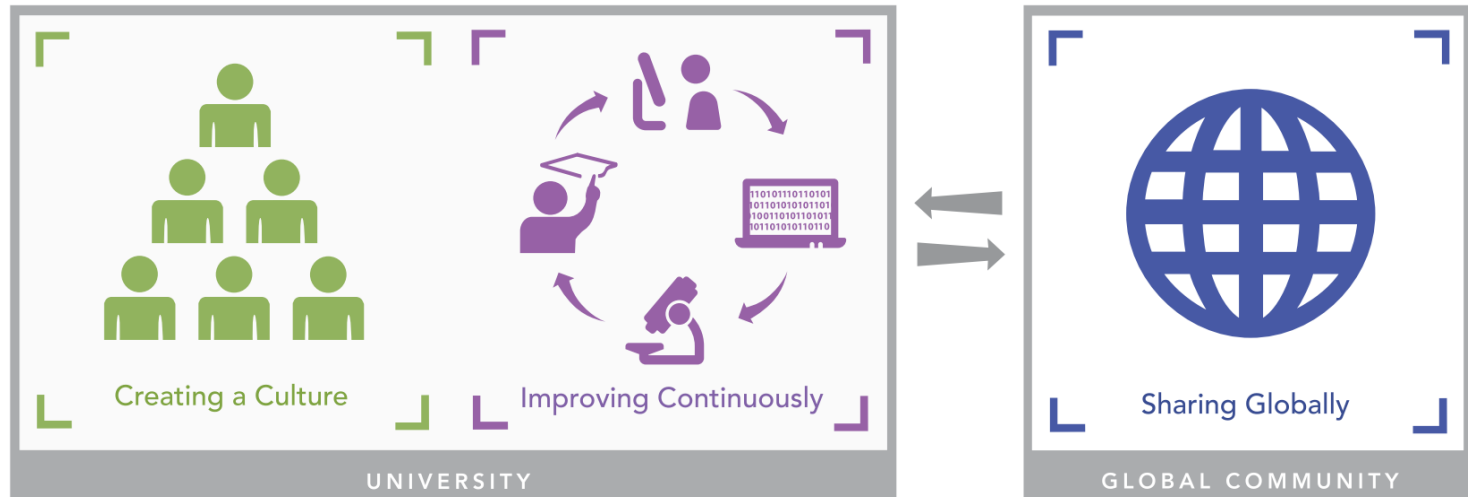
Challenges for Implementing TEL

Stigma in adopting TEL & of Teaching Technique Workshop – for Faculty

Skepticism on TEL   -   for Institutions

Potential Risk from TEL   -   for Higher Education

Implementation model*:

Create a campus culture with incentives and professional development support.

Build expertise and resources to foster a cycle of continuous improvement.

Pursue global community building and strategies for data and resource sharing.

* Technology-Enhanced Learning: Best Practices and Data Sharing in Higher Education, Global Learning Council (2015)

Technology-Enhanced Learning:

It is about time... to start

The needs for TEL:

Aging population / Smartphone culture / Innovation society

Muddy points: Haven't we started / Should we start

Challenges for implementing TEL:

Stigma in adopting TEL (need helps from institution)

Stigma in learning TEL (need helps from institution)

Skepticism on TEL (from Institution)

Potential Risk (& Benefit of TEL for Faculty & Institution)

CHULA ENGINEERING

Foundation toward Innovation