

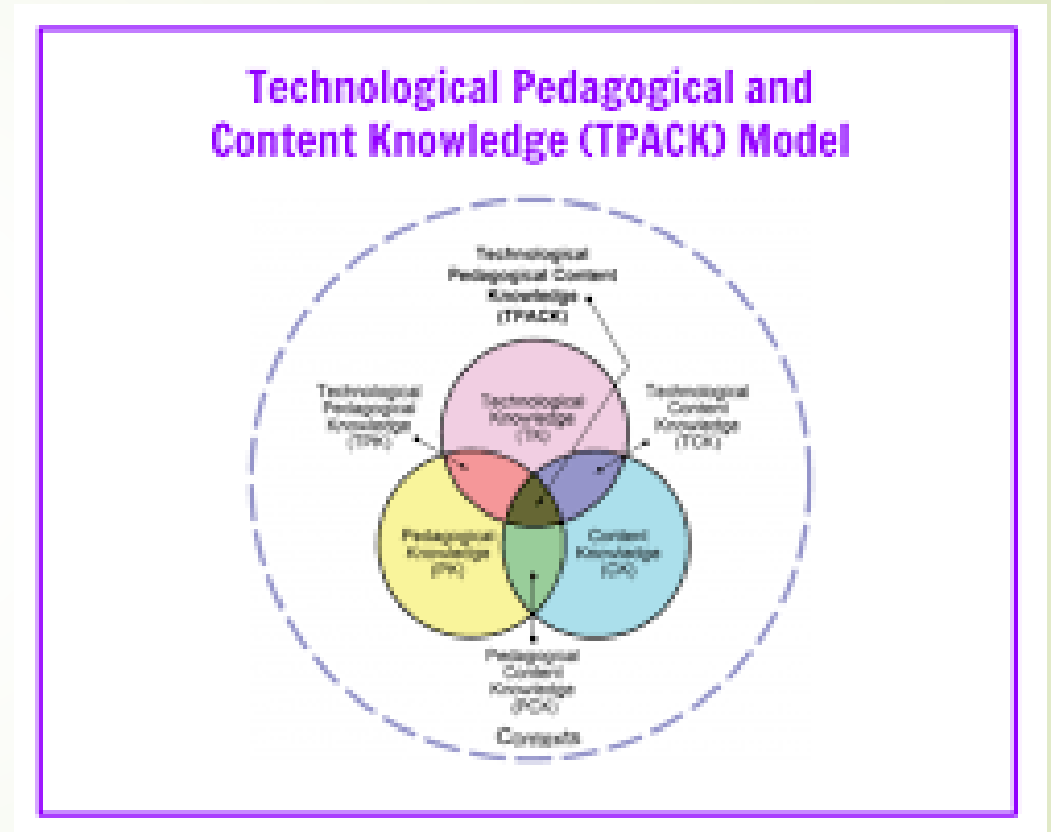


# Chapter 2

## Innovation and Technology in 21st Century Learning

## Technological Pedagogical Content Knowledge

The technological pedagogical content knowledge framework describes the kinds of knowledge required by teachers for the successful integration of technology in teaching. It suggests that teachers need to know about the intersections of technology, pedagogy, and content.



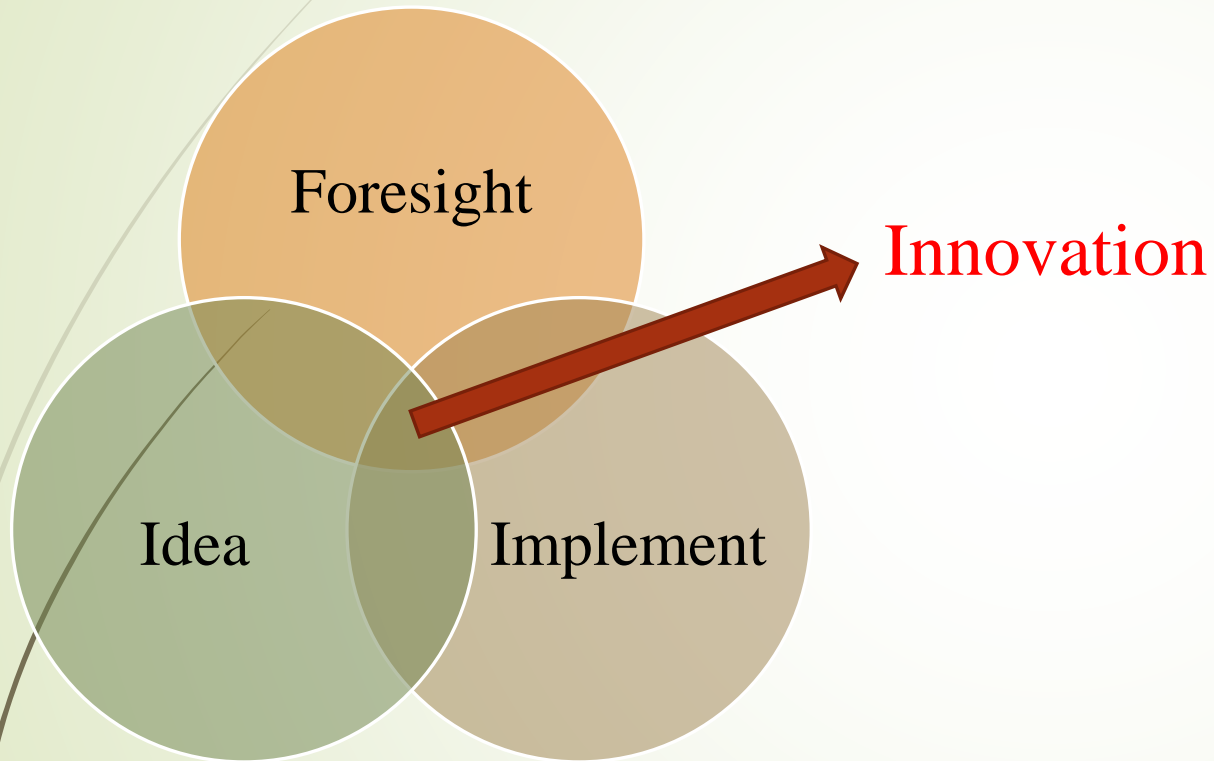
**Source:** [https://en.wikipedia.org/wiki/Technological\\_pedagogical\\_content\\_knowledge](https://en.wikipedia.org/wiki/Technological_pedagogical_content_knowledge)

## Concepts of Educational Innovation

“**Educational innovation**” means the adoption of new ideas, new methods, or new things, or the development, improvement, change or addition of old ideas, old methods, or old things that help the learning process for the prosperity of a person. and society continuously throughout life.



## Successful 3 Elements of Educational Innovation



Successful innovation needs all three elements: idea, implement, and **foresight**.

**Foresight in education** focuses on success for improvement students' learning behaviors.

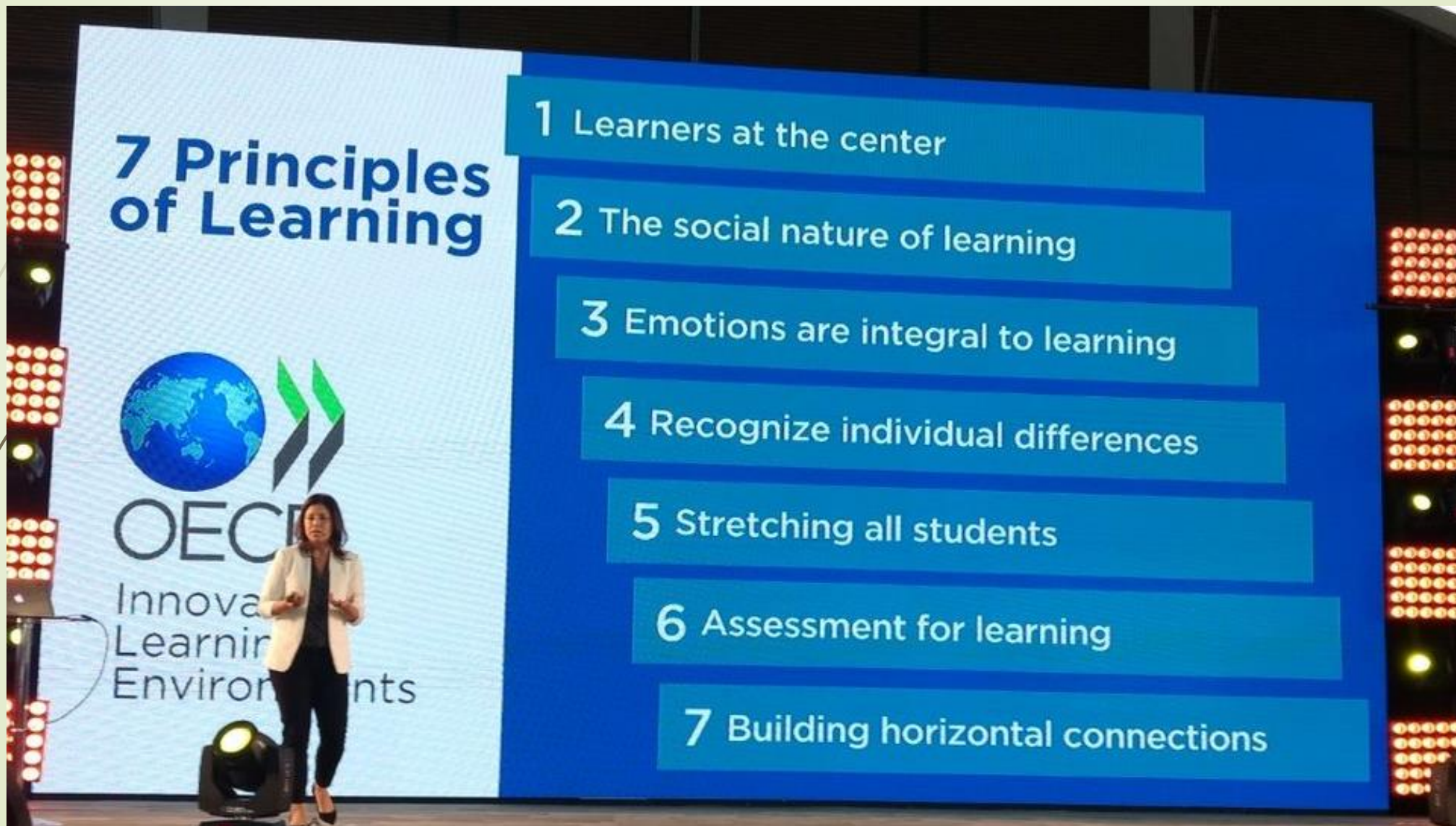
# Bloom's Taxonomy for Learning

**Bloom's taxonomy** is a hierarchical framework for cognition and learning objectives.





# Principles of Educational Innovation



# Deep Learning and Teaching for Mastery in Singapore

- Actively processing, not passive receiving
- Questioning information, not uncritically scanning
- Using and testing ideas, not just memorizing
- Thinking broadly, not narrowly
- Motivated by ideas, not by tests
- Ideas taken forward, not left behind
- Interactive whole-class teaching
- Collaboration

**Source:** <https://www.youtube.com/watch?v=zL7w0LFYezk>

# Concepts of Educational Technology

**Educational technology** means the use of technology in teaching and learning to provide additional opportunities for learners to explore and make discoveries mathematical concepts more efficient and effective.





# Examples of Educational Technology

## Learner to Content

Flashcards

RSS Feeds

YouTube Videos

FAQ Forums

## Learner to Instructor

Lessons

Quiz and Tests

Video Conferences

Emails

Projects

## Learner to Learner

Chat

Discussion Forums

Blogs

Wikis

## Impact of Technology in Classrooms

Using technology in classrooms has the potential to create increased student motivation, increased social interaction, positive outcomes, enhanced student learning, and enhanced student engagement. Technology is capable of unlocking keys of learning with all students.



**Source:** <https://files.eric.ed.gov/fulltext/ED554557.pdf>

# Principles of Educational Technology

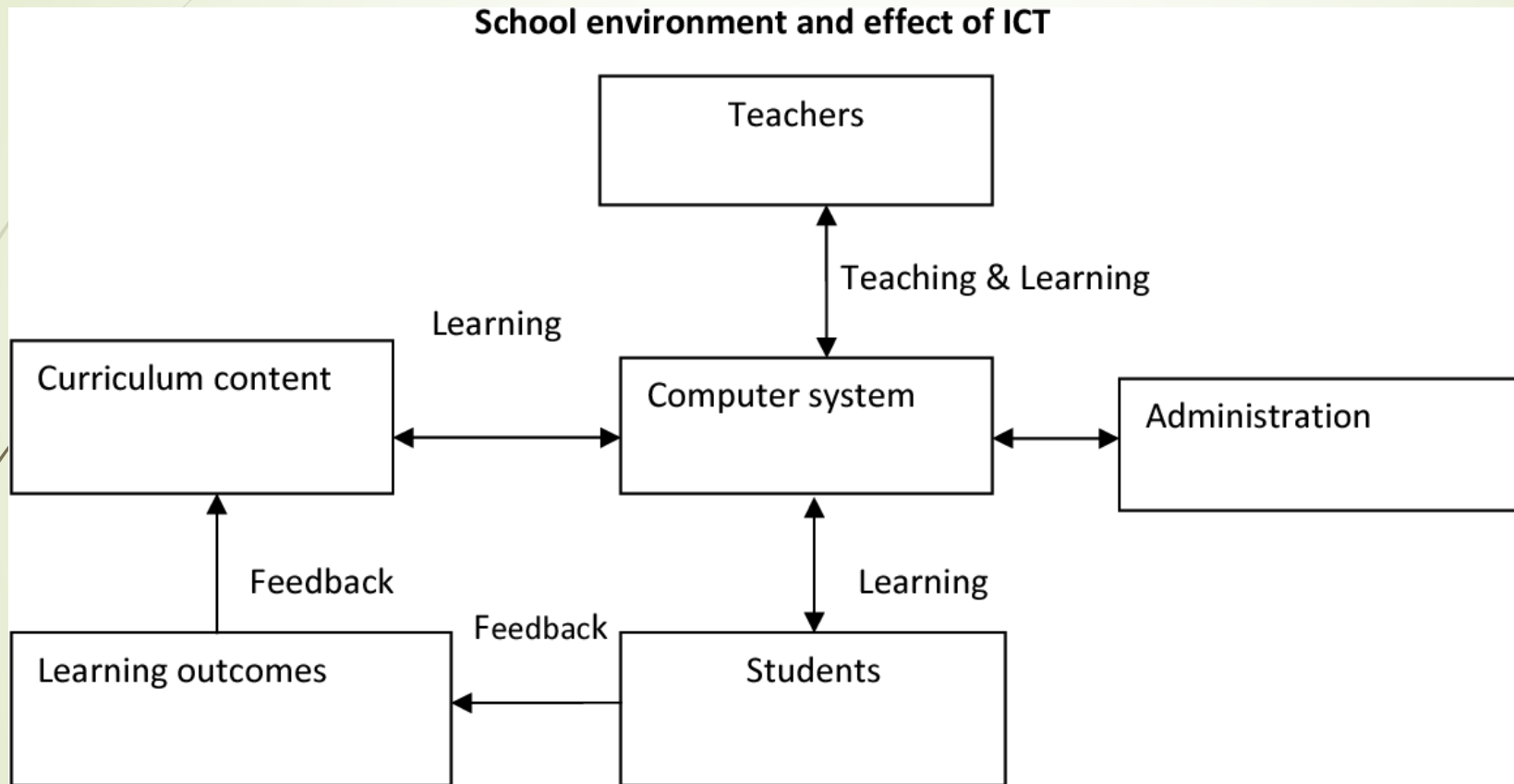
1. Considered implementation
2. Appropriate tools, techniques, or process
3. Facilitate the application of senses, memory and cognition
4. Enhance teaching practice
5. Improve learning outcomes







# School Environment and Effect of ICT



## Principles of Using ICT in School

1. Educational problems
2. Added value
3. Sustainability
4. Multiple uses
5. Lowest cost
6. Reliability
7. Ease of use



Source: National University of Singapore (January 6, 2012)

## Innovation and Technology in Math Class

Technology provides additional opportunities for learners to see and interact with mathematical concepts. Students can explore and make discoveries with games, simulations and digital tools.

The teachers should **produce very good teaching materials, and very innovative teaching ideas to engage the students in the classrooms.**



**Source:** <https://www.edutopia.org/video/singapores-21st-century-teaching-strategies-education-everywhere-series>

## Innovation and Technology in Math Class (cont.)

Today, knowledge is no more a monopoly among the teachers. Because students can get knowledge from a myriad of sources. And hence, the role of **the teacher today is facilitation**. That means facilitate students **where they could get the right knowledge, how they could synthesize things, how they could discern the information that they get.**

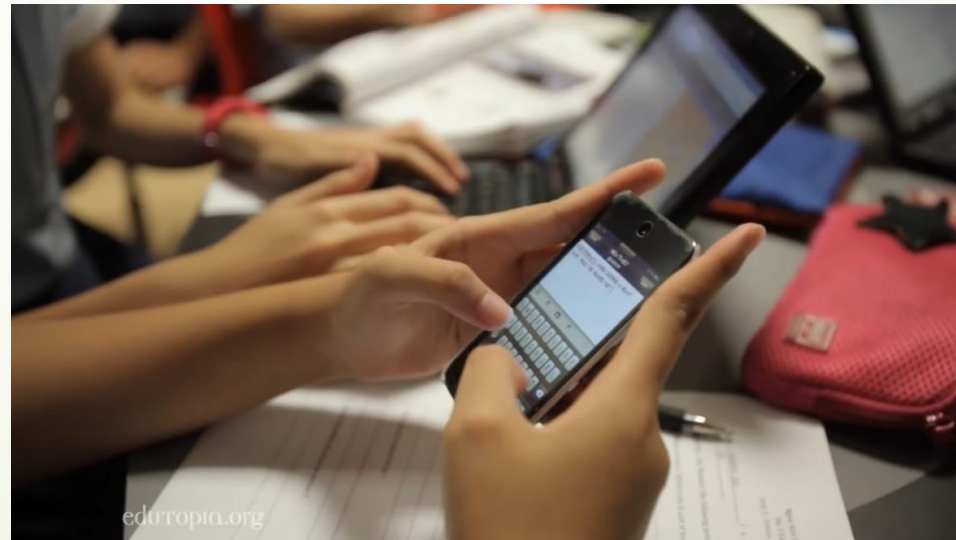


**Source:** <https://www.edutopia.org/video/singapores-21st-century-teaching-strategies-education-everywhere-series>



## Innovation and Technology in Math Class (cont.)

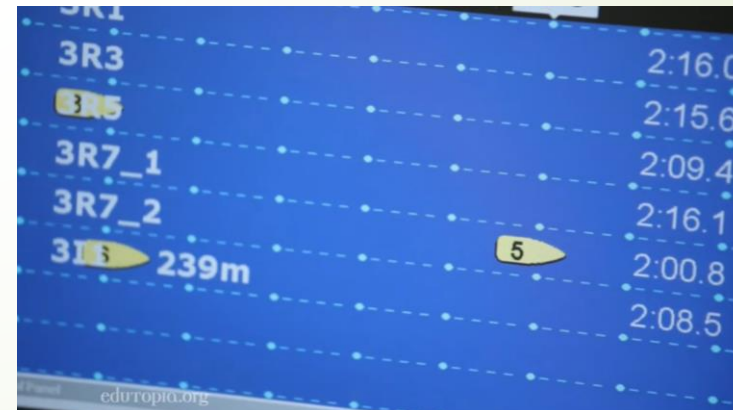
Students could ask questions at the same time, and the teacher could see their thinking on the technology tool that they use. And kids get more excited, because they are using the tools that they are very, very good in using. Not just a pen and pencil.



**Source:** <https://www.edutopia.org/video/singapores-21st-century-teaching-strategies-education-everywhere-series>

## Innovation and Technology in Math Class (cont.)

The world has changed. And teaching cannot stay stagnant. So the teachers recognize the fact that they cannot teach the same way that they are taught ten/twenty years ago. That they have to be **very adaptive in their matters**. And when they do that well, they know they're going to engage the kids. And when you **engage the kids, that is where real learning takes place**.



**Source:** <https://www.edutopia.org/video/singapores-21st-century-teaching-strategies-education-everywhere-series>

## Assignment

Watch on the suggested YouTube

<https://www.texthelp.com/resources/blog/what-are-the-benefits-of-using-technology-for-math/>

Topics for submission: (via E-mail Chaweewan.ka@ssru.ac.th)

### Connect Math Concepts to the Real World:

1. Title : (at 0:01/1:40) .....
2. List of **two cheese brands and price** used in the VDO  
**Example:** (at 0:14/1:40) “sharp cheddar cheese” low price! \$2.99.
3. Which one is cheaper? Explain (in Thai).

# Q & A



END