



**Structured Professional Development Programme for
Teacher of Self-financing Tertiary Education in Hong Kong**

Enabling Meaningful Learning of Students

Module 1A

Introduction to Pedagogical Content Knowledge

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Indicators of Learning

What is/are the indicator(s) that a student has learned something?

Such as

- How to make a cup of coffee?
- How to show that two triangles are congruent?

Meaningful Learning

A learner:

- has mastered the essences of using the knowledge/skills
- has integrated the new knowledge/skills into his/her own cognitive system
- can recall that knowledge/skills automatically when needed

Question for reflection

- Is it sufficient that a teacher with rich content knowledge (of the subject he/she is teaching) and general pedagogical skills (such as instructional methods (lecturing, demonstration, workshop etc), classroom management, assessment, etc) can enable meaningful learning of students?



Question for reflection

If not...

then what major categories of knowledge a teacher should have in order to enable meaningful learning of students?

The Big Picture

- What a teacher should know in order to facilitate meaningful learning of students?
- How to utilize each category of knowledge in facilitating meaningful learning of students

What we will do in this Programme

- In Module A, we will:
- Conceptualize meaningful learning
- Explore the categories of knowledge a teacher should have to enable meaningful learning
- Choose one category of teacher knowledge and explore how this category of knowledge can contribute to enabling meaningful learning

What we will do in this Programme

- In Module B, we will:
- Look at examples leading to meaningful learning
- Have hands on experiences in designing meaningful learning experiences
- Exchange views and experiences amongst colleagues

What's next in this Programme

- Apart from these two modules, we will continue to explore how other categories of teacher knowledge contribute to enabling meaningful learning
- (if resources allowed)

What's next in this Programme

- For each subject area, identify a set of specific teacher knowledge which are essential to enable meaningful learning (Subject knowledge for teaching instead of just subject knowledge per se, or Pedagogical Content Knowledge)
- (if resources allowed)



Teacher Knowledge

for enabling meaningful learning

- knowledge of representations of subject matter (content knowledge);
- knowledge of students, i.e. understanding of students' conceptions of the subject and the learning teaching implications that were associated with the specific subject matter;
- general pedagogical knowledge (or teaching strategies);



Teacher Knowledge

for enabling meaningful learning

- curriculum knowledge;
- knowledge of educational contexts, such as workings of classroom, the governance of schools, the character of communities and cultures, etc.;
- knowledge of the purposes of education, in particular the learning of the said content; and
- pedagogical content knowledge.

Pedagogical Content Knowledge (PCK)

- Teachers' interpretations and transformations of subject-matter knowledge in the context of facilitating student learning, i.e. the special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding

Content Knowledge

knowledge of representations of subject matter

- Question for discussion:

What should a teacher know (in order to facilitate meaningful learning of students) if s/he has to teach the topic:

- “What is the structure of an atom?”

Content knowledge for teaching

- The amount and organization of content knowledge per se in the mind of the teacher.
- It grows in the mind of a teacher with experience.
- It is the beyonded knowledge of facts or concepts of a domain.

Content knowledge for teaching

- It is about the structures of the subject matter, which includes:
- Substantive structure; and
- Syntactic structures

Substantive Structure

- The variety of ways in which the basic concepts and principles of the discipline are organized to incorporate its facts.

Syntactic Structure

- The set of ways in which truth or falsehood, validity or invalidity are established.
- Syntactic structures like grammar – “it is the set of rules for determining what is legitimate to say in a disciplinary domain and what “breaks the rules”

David Paul Ausubel

Meaningful learning

- An individual's existing cognitive structure is the principal and basic factor influencing the learning and retention of meaningful new materials.

Integrate to the existing cognitive system of a learner

New material can be subsumed to the existing cognitive structure of a learner in two different ways:

- Correlative subsumption – new material is an extension or elaboration of what is already known;
- Derivative subsumption – new material or relationships can be derived from the existing structure.

New Unfamiliar Material

- When one encounters completely new and unfamiliar material, then rote learning, as opposed to meaningful learning, takes place.
- This rote learning may eventually contribute to the construction of a new cognitive structure which can later be used in meaningful learning.

Figuring Out

- Completely new concepts can emerge; and
- Previous concepts can be changed or expanded to include more of the previously existing information

Your turn

Assume that you are to teach one of the following three topics:

- How to make a cup of coffee?
- How to show that two triangles are congruent?
- What is the structure of an atom?

Your turn

Choose one topic and

- List your indicator(s) that students have learned
- List what knowledge and skills about the topic that you should have in order to facilitate the effectiveness of student learning.
- In a diagram, show how the indicators of student learning are connected