Multiple Models of Integrated Learning:
Conception, Effectiveness, & Creativity

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Conference on Integrated Learning: Research & Classroom Practice
After 20 years……

In facing globalization, do we worry that our graduates will be unable to find an appropriate job locally or regionally and have to retire at the age of 30s to 40s?

- Yes? No?
After 20 years.............

- In facing challenges of competitions, can our graduates have the multiple thinking ability and creativity to achieve maximum opportunities and enjoy sustainable future development?

- How can they achieve these abilities? Integrated Learning or 通識?
<table>
<thead>
<tr>
<th>Implications from H Levin (1997)</th>
<th>High Value-added Competence</th>
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<tbody>
<tr>
<td>1. Initiative</td>
<td>7. Problem Solving</td>
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<tr>
<td>2. Cooperative</td>
<td>8. Decision making</td>
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<tr>
<td>5. Assessment &amp; Evaluation</td>
<td>11. Learning Ability</td>
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<tr>
<td>6. Reasoning</td>
<td>12. Multi-cultural Ability</td>
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Implications from H Levin (1997):

**High Value-added Competence**

1. Initiative
2. Cooperative
3. Team work
4. Peer Training
5. Assessment & Evaluation
6. Reasoning
7. Problem Solving
8. Decision making
9. Achieving & Using Information
10. Planning
11. Learning Ability
12. Multi-cultural Ability

- **High level ability, Meta-cognition ability**
- **Mainly not from text books**
- **Achieved from action learning & all round experiences**
What is Action Learning?
Action Learning Cycle

1. Mind-set
2. Plan
3. Action
4. Monitor
5. Outcome
6. Feedback
7. Feedback

Develop Sustainable Abilities: Multiple Thinking & Creativity

Develop Technical Skills

High Order Learning

Low Order Learning
How to facilitate students to achieve sustainable high-order learning & develop deep-level multiple thinking ability?

Integrated Learning?
Multiple Developments in Globalization

- Technological Development
- Economic Development
- Social Development
- Political Development
- Cultural Development
- Learning Development
Multiple Developments & Contextualized Multiple Intelligences (CMI)

- Technological Person
- Economic Person
- Social Person
- Political Person
- Cultural Person
- Learning Person

Technological Intelligence
Economic Intelligence
Social Intelligence
Political Intelligence
Cultural Intelligence
Learning Intelligence

Multiple & Sustainable Effectiveness for Multiple Developments in New Era

Challenges from Changing Environment
Pentagon Theory of Learning for Development of CMI & Creativity

- Technological Intelligence
- Economic Intelligence
- Political Intelligence
- Cultural Intelligence
- Social Intelligence
- Intelligence/Thinking Transfer

Learning Intelligence
遷想妙得

饒宗頤
馬彥遠
Challenges to Our Education:

How well can we facilitate student’s learning to

- Develop CMI/ CMT?
- Perform Intelligence/ Thinking Transfer? → Creativity
Challenges to Our Education:

How well can we facilitate students’ learning to “Develop CMI/CMT, Perform Intelligence/Thinking Transfer, Creativity”?

- Can integrated learning create optimal opportunity to promote CMT and Thinking Transfer?
- What kind of integrated learning would be effective?
Vertical Thinking in Learning

Within One Subject/Domain

Intelligence
(e.g. technological)

Knowledge
(e.g. technological)

Information
(e.g. technological)

Data
(e.g. technological)

Action Learning

Thinking Upward
• Meta-understanding
• Conceptualizing
• Synthesizing
• Analyzing
• Describing
• Classifying
• Measuring
• Observing

Thinking Downward
• Theorizing
• Predicting
• Applying
• Planning
• Experimenting
• In-forming
• Discovering

Higher Order Learning

Lower Order Learning
Levels of Thinking in Multiple Contexts

Multiple Data (Technological, Economic, Social, Political, Cultural, Learning)

Multiple Information

Multiple Knowledge

Multiple Intelligence

Application of Intelligence & Knowledge in Action: Deepening Thinking

To provide a rationale

To predict & explain relationship

To make sense from reality

To inform & plan

Deep Learning & Thinking in Action

To convert knowledge as internalized meta-recognition & mindset

To draw out higher consistent & reliable understanding from linked information

To draw out meaning from analysis of data of action

To monitor & assess

To draw out understanding from linked information

To convert knowledge as internalized meta-recognition & mindset

To make sense from reality
Levels of Thinking in Multiple Contexts

- Are our existing designs of "integrated learning" effective to such students' high-level learning and thinking?

- What is integrated learning?

- What nature of integration?
Basic Types of Integrated Learning

A. Content Types of Integration

1. Subject Integration
2. Domain Integration

B. Pedagogical Types of Integration

3. Method Integration
1. **Subject Integration Type**
Integrating the subject/ disciplinary content in learning

e.g.

- **Integrated Sciences** (integrating Physics, Chemistry, Biology, etc.)

- **Integrated Social Sciences** (integrating Geography, Sociology, Economics, Political Science, etc.)

- **Integrated Humanities** (integrating Arts, Philosophy, History, Anthropology, etc...)
2. Domain Integration Type

Integrating different domains of knowledge or disciplines in learning

e.g.
- Multi-cultural Studies
- Multi-domain Studies
3. Method Integration Type
Integrating various methods in learning

e.g. Learning by

- Reading
- Listening
- Performing
- Discussing

Integration of some forms
- Experiencing
- Questioning
- etc.

Integration of Some forms
- Project Learning
- Group Learning
- Self-regulated Learning
- Online Learning
- Hybrid Learning
- Face-face Learning, etc.
4. Cognitive Integration Type
Integrating different cognitive activities in learning

- Observing
- Measuring
- Classifying
- Describing
- Analyzing
- Synthesizing
- Conceptualizing
- Meta-understanding
- Etc.

Integration of cognitive activities

- Theorizing
- Predicting
- Applying
- Planning
- Experimenting
- Informing
- Discovering
- Etc.
Integration, Complexity & Effectiveness in Learning?

- Principle 1:
  - More integration in content or pedagogy →
  - More exposure & more complexity in learning
Integration, Complexity & Effectiveness in Learning?

- **Principle 2:**
  - More exposure & more complexity in learning →
  - More demanding for & challenging to students’ limited ability, effort & time

- May not result in learning more and deeper, depending on various factors
Traditional Learning: Vertical Cognitive Integration in Separated Subject Learning

Cognitive Activities
- Meta-understanding
- Conceptualizing
- Synthesizing
- Analyzing
- Describing
- Classifying
- Measuring
- Observing

Intelligence
- Knowledge
- Information
- Data

Geography
- Economics
- Mathematics
Traditional Learning: Vertical Cognitive Integration in Separated Subject Learning

**Strength:**
- Good to promote vertical cognitive integration or vertical thinking in each subject area

**Weakness:**
- Lack of opportunity to benefit from knowledge transfer from one subject to other
High Level vs Low Level
Horizontal Subject Integration

- Meta-understanding
- Conceptualizing
- Synthesizing
- Analyzing
- Describing
- Classifying
- Measuring
- Observing

High Level Integration

Low Level Integration

Geography Economics Mathematics
Level of Cognitive Integration & Subject Integration in Learning?

Principle 3:

Given the complexity & difficulty in subject integration & the limited time & ability,

- There is a tendency that both students and teachers adopt low level of cognitive integration involving mainly data & information
- Result in low level learning and thinking
- Education Bubbles in integrated learning
How to raise the cognitive level of Horizontal Subject Integration?

Given the complexity in subject integration,

In fact, it is not easy to raise the cognitive integration from the lower level to the higher level of knowledge and intelligence.

How can we do that?
How to maximize both Vertical Cognitive Integration & Horizontal Subject Integration?

**Integrated projects**
- To integrate subject content & benefit from transfer of thinking and knowledge from one domain to others

- **Meta-understanding**
- **Conceptualizing**
- **Synthesizing**
- **Analyzing**
- **Describing**
- **Classifying**
- **Measuring**
- **Observing**

**Data**
- Geography
- Economics
- Mathematics
What implications for development of integrated learning in Hong Kong and international community?
4 Models of Integration in Learning

**Model I: Total Integration**
- High integration in content
- High integration in pedagogy
- Maximized exposure in content and pedagogy
- Highest complexity in learning

**Model II: Content Integration-Pedagogy Separation**
- High integration in content
- Low integration in pedagogy
- Maximized exposure in content
- High complexity in content but low complexity in pedagogy

**Model III: Content Separation-Pedagogy Integration** (Traditional)
- Low integration in content
- High integration in pedagogy
- Limited exposure in content and pedagogy
- Separated & fragmented learning
- Lowest complexity in learning

**Model IV: Total Separation** (Traditional)
- Low integration in content
- Low integration in pedagogy
- Limited exposure in content & pedagogy
- Separated & fragmented learning
- Lowest complexity in learning
Each Model has its own strengths, weaknesses, & significance.

Its effectiveness depends on the purposes, time frames & contexts of learning.

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- Separated & fragmented learning
- Lowest complexity in learning

**Situation of Integrated Learning in HK**
What implications for understanding the relationship between Integrated Learning and Development of Creativity?
Creativity in Integrated Learning

• as ability to create new data, new information, new knowledge or/and new intelligence in integrated learning
Hierarchy of Creativity in Integrated Learning

- Create New Intelligence
- Create New Knowledge
- Create New Information
- Create New Data

Creativity in Thinking

Integrated Learning
Ways to enhancing creativity in integrated learning?
1. Creativity in Integrated Subject Learning

Integrated Learning across two subject domains

(e.g. Economics) (e.g. Technology)

Creativity in Thinking

Intelligence

Knowledge

Information

Data
2. Creativity in Integrated Project Learning
(e.g. aims at development of social thinking and intelligence)

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Integrated Learning across 4 Subject domains
3. Creativity by **Transfer** in Integrated Learning

(e.g. Technology)  (e.g. Economics)

Data Transfer

Intelligence Transfer

Knowledge Transfer

Information Transfer

New Data

New Information

New Knowledge

New Intelligence

Integrated Learning
I hope, our schools would facilitate their students successfully in integrated learning.

All our students can become high-order active learners to pursue life-long developments in future.
Acknowledgment:

• This is one of the reports from a research project on school-based management and paradigm shift in education in Hong Kong schools. The research team would like to acknowledge the support of the Competitive Earmarked Research Grant awarded by the Research Grants Council of University Grants Committee of the Hong Kong SAR Government to their research project (HKIEd8003/03H) that contributed to development of this presentation.