The Philippines’ approach to assessment of 21st century skills

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Global Framework of Learning Domains

From Report No. 1 of the Learning Metrics Task Force, p. 4

Frameworks

- UNESCO
- OECD

- Learning to know
- Learning to do
- Learning to be
- Learning to live together

Frameworks

- Use tools interactively
- Act autonomously
- Interact in heterogeneous groups

The process undertaken

- Review of 21st century frameworks
- Review of national frameworks
- Identification of common themes
- Alignment with the Philippines core educational goals

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Initial audit steps

1. Identify skills and competencies listed on the map.
2. Use data in any language to demonstrate generality.
3. Critical thinking.
4. Problem solving.
5. Information literacy.
7. Collaboration.

Criteria for selection of skills

1. Are the skills teachable and learnable?
2. Can the skills be embedded through the subject studies to demonstrate generality?
3. Will enhancement of these skills enhance student learning outcomes in subject studies?

Selected skills

- Information media and technology
  - Technology literacy
  - Critical thinking
  - Problem solving
  - Information literacy
  - Innovation
  - Collaboration

ICT Literacy Across Selected Disciplines

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The Assessment, Curriculum and Technology Research Centre is a partnership between the University of Melbourne and the University of the Philippines supported by Australian Aid.
Data derived from key indicators of the Labour Market, 7th ed., International Labour Organization

Technology Literacy
- Technology Literacy is the ability to responsibly use appropriate technology to: communicate, solve problems, access, manage, integrate, evaluate, design and create information to improve learning in all subject areas.
  (Colorado Department of Education (CDE))
- Technological Literacy is the ability to use, manage, assess and understand technology. (ITEA Standards for Technological Literacy, 2007)
- ICT Literacy is using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society. (Int'l ICT Literacy Panel, 2002)

Information Literacy
- Information literacy should be conceived more broadly as a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact. (Shapiro and Hughes, 1996)
- Information literacy is the ability to gather, manage, synthesise and create information and data in an ethical manner and the information skills to do so effectively. (SCONUL, 2011).

IMT Literacy
The ability to create, evaluate, and effectively use information, media, and technology

Information Literacy
the ability to access, manage, use and evaluate information

Technology Literacy
the ability to use technology to access, manage, and communicate information

Process

Construct
- Concept definition
- Description
- Hypothetical progression

Curriculum
- Audit across subjects
- Build empirical progression

Assessment
- Assessment cube
- Item development
- Panel and pilot
- Develop teacher materials
### Challenges in organizing competencies

- Creates an audio-video art/animation promoting a product. [CG, Arts]
- Can (safely) use computer, internet and e-mail [CG, EPP]
- Can use computer and internet to compile, search and organize information [CG, EPP]
- Can use Online Public Access Catalogue (OPAC) [CG, F]
- Use computers for collection, summary and display of evidence [CG, S]

### From curriculum competencies to skills

| Audit of K to 12 Curriculum | Identification of Similar Competencies | Identification of the Underlying IMT Skills |

### Similar Competencies

**Accessing/Gathering Information**

- Can use Online Public Access Catalogue (OPAC) [CG, F]
- Can use technology to find sources of information [CG, AP]
- Use computers for collection, summary and display of evidence [CG, S]

**Managing Information**

- Can use computer and internet to compile, search and organize information [CG, EPP]
- Use computers for collection, summary and display of evidence [CG, S]

**Communicating Information**

- Creates an audio-video art/animation promoting a product [CG, Ar]
- Use computers for collection, summary and display of evidence [CG, S]
- Creates advertisement, documentary, short film or blog about a movie [CG, F]

**Evaluating Information**

- Can identify source of information [CG, AP]
- Can distinguish facts from fabrications from newspapers, radio, television programs and articles from the internet [CG, EsP]
- Synthesize overall knowledge about different information and media sources by producing and subsequently evaluating a creative multimedia form and media sources [CG, E]
Information Literacy in Science

Esther Care

Domain-specific and domain-general skills

The ability to solve problems depends on more than just domain-specific knowledge (Mayer, 1998)

Domain general

Domain specific

There is value in focusing on identifying possible instructional measures to teach skills in various subject areas in a way that might allow more flexible transfer (Dimitru, 2012)

Science and 21st Century Skills

“In the context of science education, 21st Century Skills offer some new ways of framing what have long been a valued approach in the science classroom…”

The inverse is also true, science contributes its rich traditions of critical and creative thinking, applied technologies, and collaborative work- along with high standards for communication and personal responsibility – to the benefit of all discipline areas”

Partnership for 21st Century Skills
21st Century Skills in the Science Curriculum

- Communication Skills
  - Communication
    - Ask for clarification
    - Communicate
    - Build persuasive arguments
  - Flexibility to adapt to an audience

- Collaboration
  - Planning
  - Respect the views of others
  - Respond to others
  - Reflecting
  - Share responsibility

21st Century Skills in the Science Curriculum

- Information, Media & Technology Skills
  - Information Literacy
    - Ability to manage information
    - Determine relationships between information
    - Categorise and classify information
    - Understand ethical practices
    - Assess reliability of sources
    - Identify relevance of information
  - Technology Literacy
    - Use technology to communicate ideas
    - Illustrate designs
    - Operate equipment
    - Search the internet

- Learning & Innovation Skills
  - Creativity
    - Creating using a variety of methods
    - Identifying original ideas
  - Critical Thinking
    - Critically analyse information
    - Critique procedures
  - Problem Solving
    - Make inferences from gathered information
    - Design an investigation to solve a problem
    - Execute a strategy or method
    - Generalise
    - Verify solution

21st Century Skills in the Science Curriculum

- Item development
  - Identify and define the domain to be assessed
  - List capabilities for the domain
  - For each capability, derive observable behaviours - low, medium, high
  - Identify the link to curriculum for each behaviour
  - Develop assessment items to test competency

Conclusion

- The Science curriculum provides a good platform for assessing many of the 21st century skills
- Sets of items can be constructed within science curriculum topics that allow for assessment of level of competence within a skill area
- Sets of items relating to the same topic can allow a hierarchy of difficulty in which students can demonstrate varying levels of competence
- Therefore, we can determine not just whether or not the student has the skill but to what extent they can demonstrate the skill within a particular content area