

(ASSESSMENT)

TAXONOMIES OF LEARNING

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Lee Shok Mee

shokmee_lee@recsam.edu.my



Taxonomy (WHAT ?)

- Taxonomy means classification
- It is the classification of things or concepts, including the principles that underlie such classification
- Learning taxonomies are commonly utilised as a way of describing different kinds of learning behaviour and characteristics that we wish our students to develop.
- They are often used to identify different stages of learning development, and
- provide a useful tool in distinguishing the appropriateness of particular learning outcomes for particular levels of learning

REVISED BLOOM'S TAXONOMY

Bloom's Taxonomy (1956), adapted by Anderson et al (2001)

- The taxonomy is hierarchical: the categorization implies the earlier level must be mastered before the next level.
- Bloom taxonomy has three parts / domains: **Cognitive**, **Affective** and **Psychomotor**
- The revised Bloom's **Cognitive** domain has a hierarchy of categories that capture the process of learning, from simply remembering information to creating something new:
Remember, Understand, Apply, Analyze, Evaluate, & Create.

THE STRUCTURE of BLOOM'S REVISED TAXONOMY and SOME VERBS

Table 1: Anderson's et al (2001) Cognitive Revised Domain

| | Remember | Understand | Apply | Analyze | Evaluate | Create |
|--------------------------------|-----------------|-------------------|--------------|----------------|-----------------|---------------|
| Factual Knowledge | List | Summarize | Classify | Order | Rank | Combine |
| Conceptual Knowledge | Describe | Interpret | Experiment | Explain | Assess | Plan |
| Procedural Knowledge | Tabulate | Predict | Calculate | Differentiate | Conclude | Compose |
| Metacognitive Knowledge | Appropriate Use | Execute | Construct | Achieve | Action | Actualise |

AFFECTIVE DOMAIN

(KRATHWOHL'S TAXONOMY, REVISED BLOOM'S TAXONOMY)

- It includes concepts such as:
- Receiving ideas; Responding to ideas, phenomena;
- Valuing ideas, materials; Organization of ideas, values;
- The learner moves from being aware of what they are learning to a stage of having internalised the learning so that it plays a role in guiding their actions.

Affective Domain

Table 2: Affective Domain

| Level | Characteristic | Some Verbs |
|------------------------------------|---|--|
| Receiving | Developing awareness of ideas and phenomena | Ask Follow Reply Accept Prefer |
| Responding | Committing to the ideas etc by responding to them | Answer Recite Perform Report Select Follow Explore Display |
| Valuing | Being willing to be seen as valuing certain ideas or material | Justify Propose Debate Relinquish Defend Initiate |
| Organization and Conceptualisation | To begin to harmonise internalized values | Arrange Combine Compare Balance Theorize |
| Characterisation by Value | To act consistent with the internalised values | Discriminate Question Revise Change |

PSYCHOMOTOR DOMAIN

Dave's (1970); Ferris And Aziz's(2005) on revised Bloom's Original Taxonomy

- Narrating competence of the development in learning from initial exposure to final, unconscious mastery.
- The taxonomy deals largely with motor-area skills and the mastery of many of the skills and attributes we seek to impart to our students
- E.g. performing on a musical instrument; fluency in a language; transferable skills of encoding and decoding information in graphic forms,
- such as tree diagrams and bar charts along with the ability to produce accurate maps.

PSYCHOMOTOR DOMAIN

Table 3 Psychomotor Domain

| Level | Characteristic | Some Verbs |
|-----------------------------|--|--|
| Perception / Observing | Here the student is simply observing the procedure | Observe Listen Detect |
| Guided Response / Imitation | The student can follow instructions but needs to be instructed | Copy React Follow Reproduce |
| Mechanism | This is an intermediate stage where proficiency and confidence are growing | Organise Manipulate |
| Complex response | Proficiency has grown and performance is quick and accurate with little or no hesitation | The verbs are essentially the same as Mechanism, but modified by 'accurately' or 'quickly' |
| Adaptation | The student has such ability that they can combine and integrate related aspects of the skill without guidance | Reorganise Alter Rearrange Vary Internalise |
| Origination | The student has internalized automatic mastery of the skill | Compose Construct Design Initiate Create |

THE SOLO TAXONOMY

(Structure of Observed Learning Outcomes)

- It assists in writing learning outcomes as well as to categorise answers
- There are five hierarchical levels (Biggs & Collis, 18982; Biggs, 1992) that range from incompetence to expertise (Boulton-Lewis, 1994).

Table 4: SOLO Taxonomy

| | Characteristic | Some Verbs |
|--------------------------|--|------------------------------------|
| Pre-Structural | Incompetent, nothing known about the area | - |
| Uni-Structural | One relevant aspect is known | List, Name Memorize |
| Multi-structural | Several relevant independent aspects are known | Describe Classify Combine |
| Relational | Aspects of knowledge are integrated into a structure | Analyse, Explain, Integrate |
| Extended Abstract | Knowledge is generalised into a new domain | Predict, Reflect, Theorise |

FINK'S TAXONOMY

FINK (2003)

- A taxonomy that is not hierarchical.
- In addition it covers a broader cross section of domains with the exception of
- a psychomotor domain.
- It is similar to Anderson's taxonomy (2001) in its emphasis is on metacognition (learning to learn) and also includes more affective aspects such as the
- 'human dimension' and 'caring: identifying/changing one's feelings'.

FINKS TAXONOMY

Figure 1: Finks Taxonomy (2003)

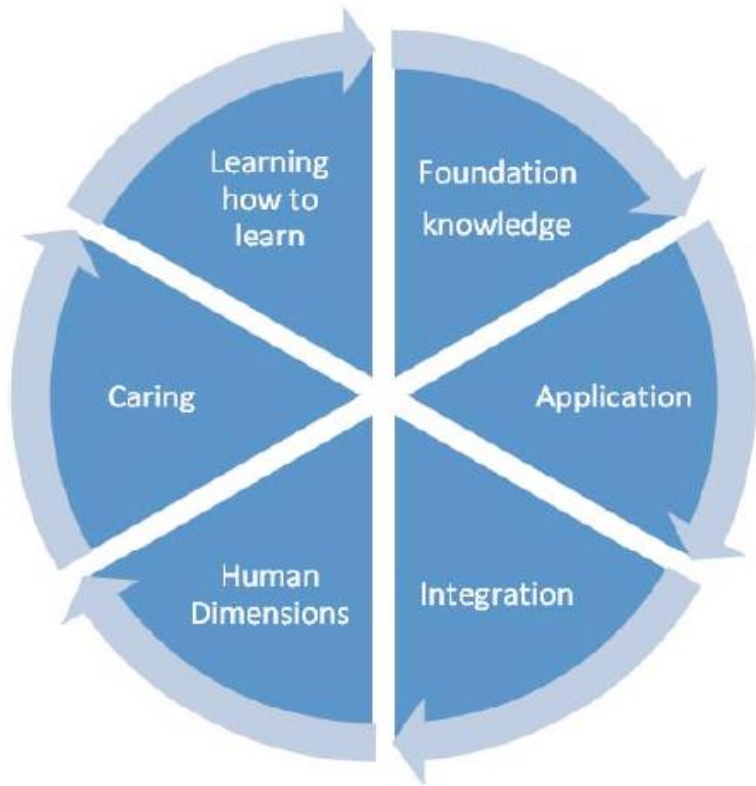
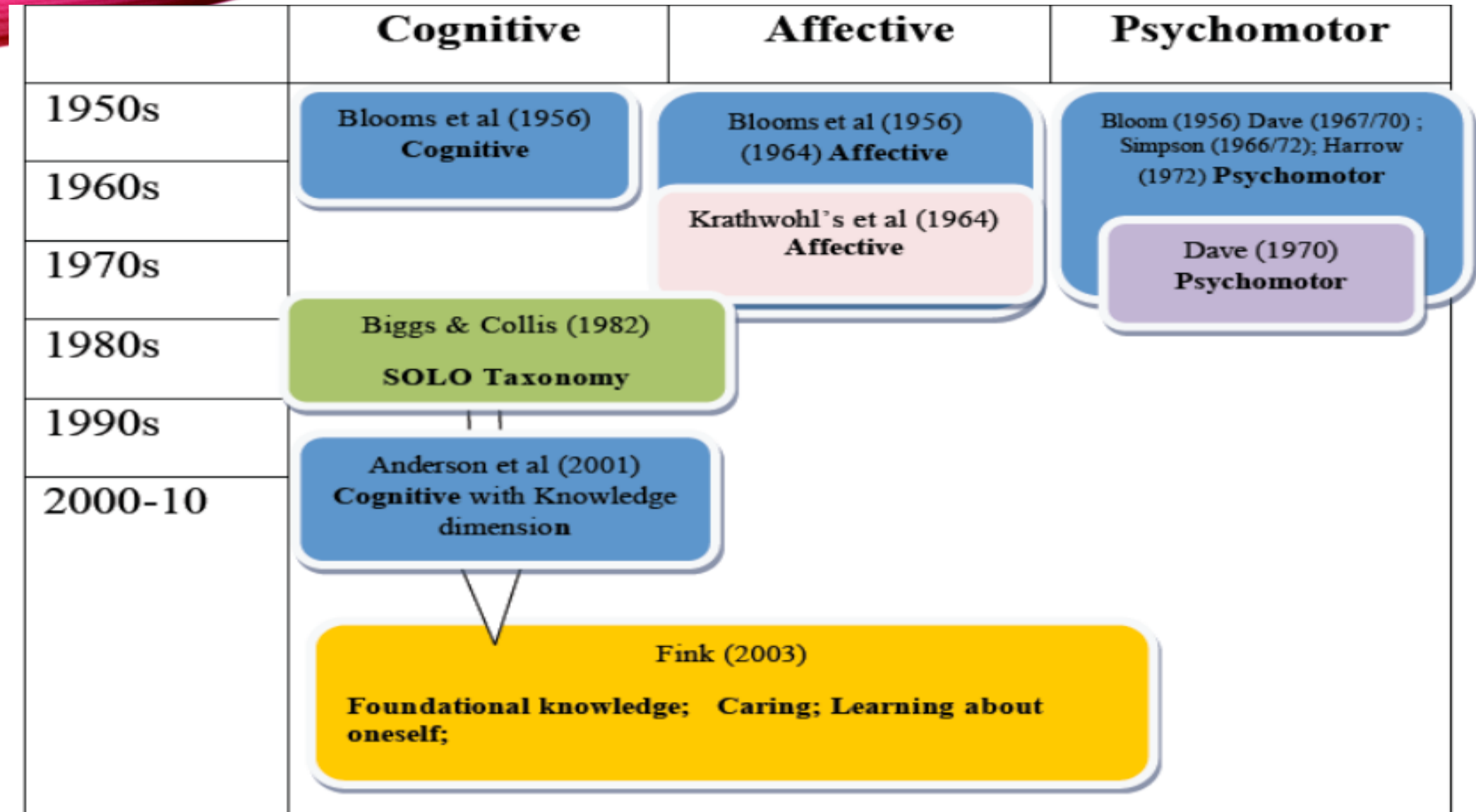


Table 5: Finks Taxonomy (2003; 2009)

| | Description | Some Verbs |
|------------------------|---|-------------------------|
| Foundational Knowledge | Understand and remember | name list describe |
| Application | Critical, creative and practical thinking; problem solving | Analyse interpret apply |
| Integration | Make connections among ideas, subjects, people | Describe integrate |
| Human Dimensions | Learning about and changing one's self; understanding and interacting with others | Reflect assess |
| Caring | Identifying/changing one's feelings, interests, values. | Reflect interpret, |
| Learning to learn | Learning how to ask and answer questions, becoming a self-directed learner | Critique analyze |

Overview of Development of Taxonomies and their Domains ¹²



SOME CRITICAL THOUGHTS WHEN EXPLORING THE TAXONOMIES ¹³ (1)

- There has been some criticism in the literature of the practice and/or implications that all learning is simply hierarchical, as it can imply that early years in the curriculum should only have lower cognitive level learning outcomes and experiences, i.e. factual, descriptive experiences.
- Challenging critical and complex learning activities can also be appropriate early in the curriculum.
- The frameworks are a guide for developing a range of student learning experiences and not a prescription; they need to be contextualised for the different disciplines/subject areas.
- There has been, over the last 50 years, huge popularity in the use of cognitive domain, despite the availability of the Affective and Psychomotor domains.
- These two have become more popular in recent years, despite the fact that all three have been there since 1956 (Bloom)

SOME CRITICAL THOUGHTS WHEN EXPLORING THE TAXONOMIES ¹⁴ (2)

- Module co-ordinators may find the diagram in the SOLO taxonomy a useful help in understanding this version of the cognitive domain (see Biggs 1999b article in references and available in UCD's Academic Search Premier Database).
- Don't be put off by some of the educational language that may not seem to relate to your area, i.e. 'caring' in the Finks Taxonomy, or 'Psychomotor' in Blooms.
- When you explore these concepts further they relate to most areas/subjects/disciplines and can often reflect some core subject/discipline values not easily covered when only using the cognitive domain.