Psychomotor Domain Skills Development in TEPL

3rd AUN-TEPL Symposium – S3P9 (May 25, 2022)

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Objectives: Be able to

(1) Analyze and identify cognitive components from the psychomotor domain

(2) Develop and evaluate psychomotor skills by using TEPL

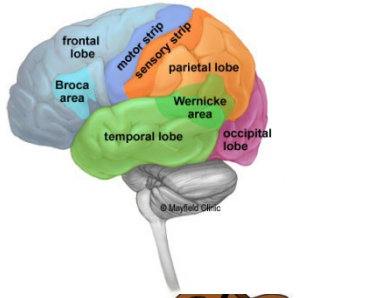
(3) Introduce Some Technology Enhanced Tools

1. Education Concept

1. Objective: Learning Outcome → CPA
2. Learning Process: Teaching & Learning
3. Evaluation: Formative, Summative

Revised Bloom's Taxonomy: 3 Domains

1. Cognitive Domain (Knowledge): Head
2. Psychomotor Domain (Skill): Hand
3. Affective Domain (Attitude): Heart



2. Psychomotor Domain

- Physical or motor skills
- Muscular skills → Skeletal muscle contraction → Voluntary control → Motor Learning
  - Hand movements
  - Language → Speaking
  - Music → Playing a musical instrument, Singing
  - Other body parts movement
- Practices make perfect

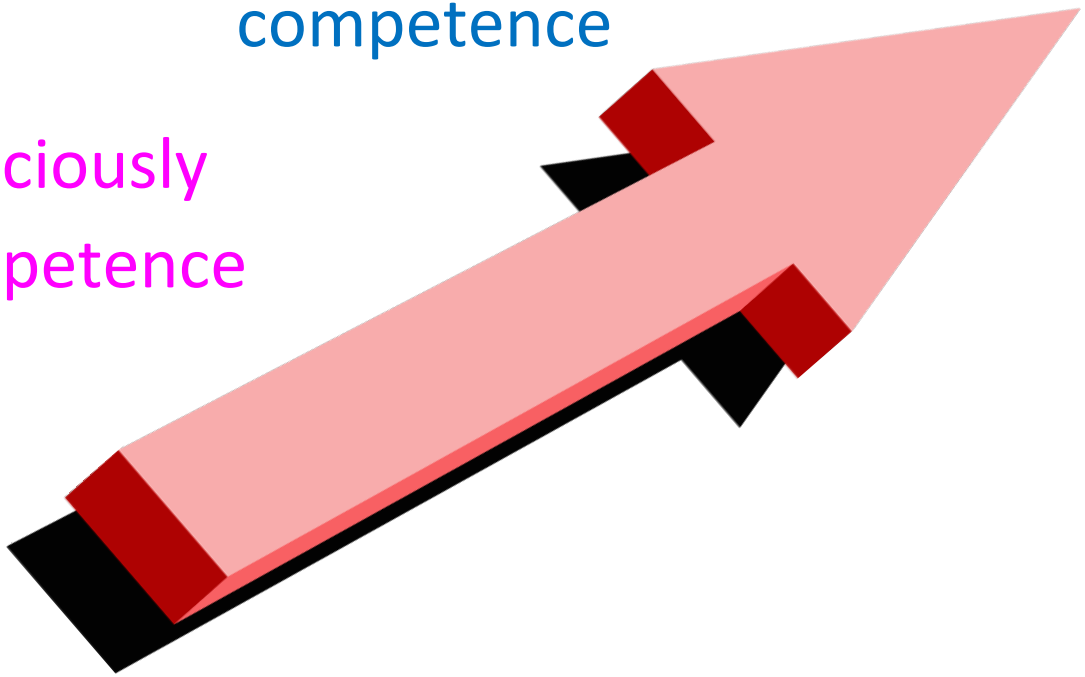
Psychomotor Competency

Unconsciously incompetence

Consciously incompetence

Consciously competence

Unconsciously competence



Novice

Intermediate

Advance

Master

Level of Mastery

Psychomotor Taxonomy

- Dave's Psychomotor Domain Taxonomy

1. Imitation
2. Manipulation
3. Precision
4. Articulation
5. Naturalization

Dave, R.H. (1970). Psychomotor levels in *Developing and Writing Behavioral Objectives, pp.20-21.*R.J. Armstrong, ed. Tucson, Arizona: Educational Innovators Press.

1. Imitation

- Watch demonstration (live or video)
  - Memorize process or action sequence
  - Observe action, gesture, direction, force, etc.
- Mentally copy process or action or behavior

→ ** *Knowledge/Cognitive part of Psychomotor*

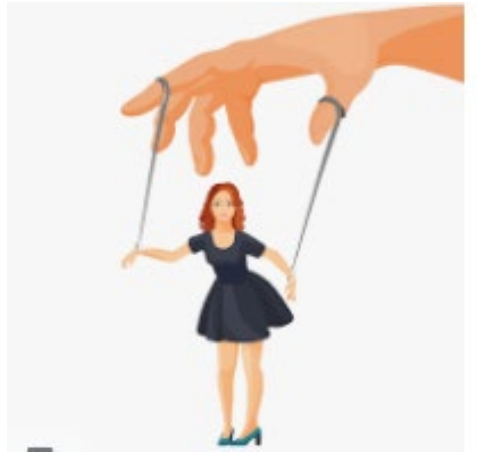
1. Imitation (2)

- TEPL
  - Self-paced learning material: Video clip, Animation
  - Personalized Learning: Simulation (what-if)
  - Interactive app.: EdPuzzle, …

Evaluation

→ Students demonstrate knowledge part of psychomotor

2. Manipulation

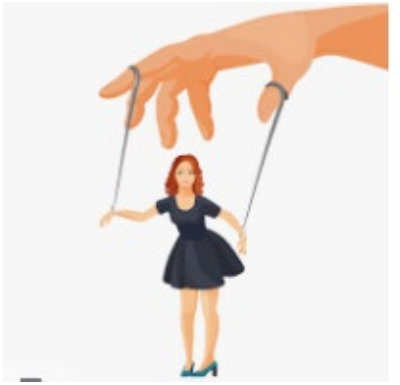


- Follow instructions through demonstrations
- Copy and perform
  the memorized action, gesture, direction, force, etc.
  by using hands or body parts

→*Real psychomotor practice*

→*Consider whether it needs Hands-on Teaching (HoT)?*

2. Manipulation (2)



- TEPL **
  - No need HoT → use video capturing and evaluate
  - Need HoT → Hybrid (+F2F), Robotics, AR/VR/MR, AI, Machine Learning

Evaluation

→ *Students Perform under supervision with the aid of hands-on teaching, verbal guide, instruction, and immediate feedback*

3. Precision

- Performance becomes more exact & precise
- Self practices or repeat under supervision
- Practices make perfect
- TEPL (same as 2)

Evaluation

→ *Students Perform high quality task without assistance or supervision*

4. Articulation

- Integrate related skills and perform in a harmonious way

- TEPL (same as 2)

Evaluation

→ *Students demonstrate high-quality tasks by applying related skills to develop methods to meet the varying and novel requirement*

5. Naturalization

- Automate & become expert
- High level of performance like a second nature

- TEPL (same as 2)

Evaluation

→ *Students define aim, approach, and strategy toward strategic need*

3. Technology Enhanced Tools

1. Video, Animation/Simulation, AR/VR/MR, ML, AI, Robot
2. Interactive App. to get Engagement & Interactivity, Formative Evaluation
   - Polling, Short answer in Chat
   - Giving interactive conversations
   - Apps: EdPuzzle, Spiral, Menti, Kahoot, …

3. Technology Enhanced Tools (2)

3. Speech/Language Training by using

   Natural Language Processing (NLP)

   - Text-To-Speech (TTS): Translation software
   - Speech-To-Text (STT): Siri, Google Voice Type,…

4. Singing Training: EarMaster, SINGPRO, WeSing,…
5. Specifically written software + Robot
6. Hybrid Learning (On-site HoT + Online)

Mixed Real & Virtual World Experience

Microsoft HoloLens 2 AR Headset

https://www.youtube.com/watch?v=uIHPPtPBgHk **

About the Speaker

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