Psychomotor Skills Teaching & Micro Mastery

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Bead Master

Winner: Longest string of beads

Bead Master

What is Psychomotor Domain?

The Psychomotor Domain is skill based and refers to the learning of physical skills.

Psychomotor skills include actions such as contacting, manipulating, or moving an object and controlling the body or parts of the body.

- The learner must use muscular action
- With or without equipment
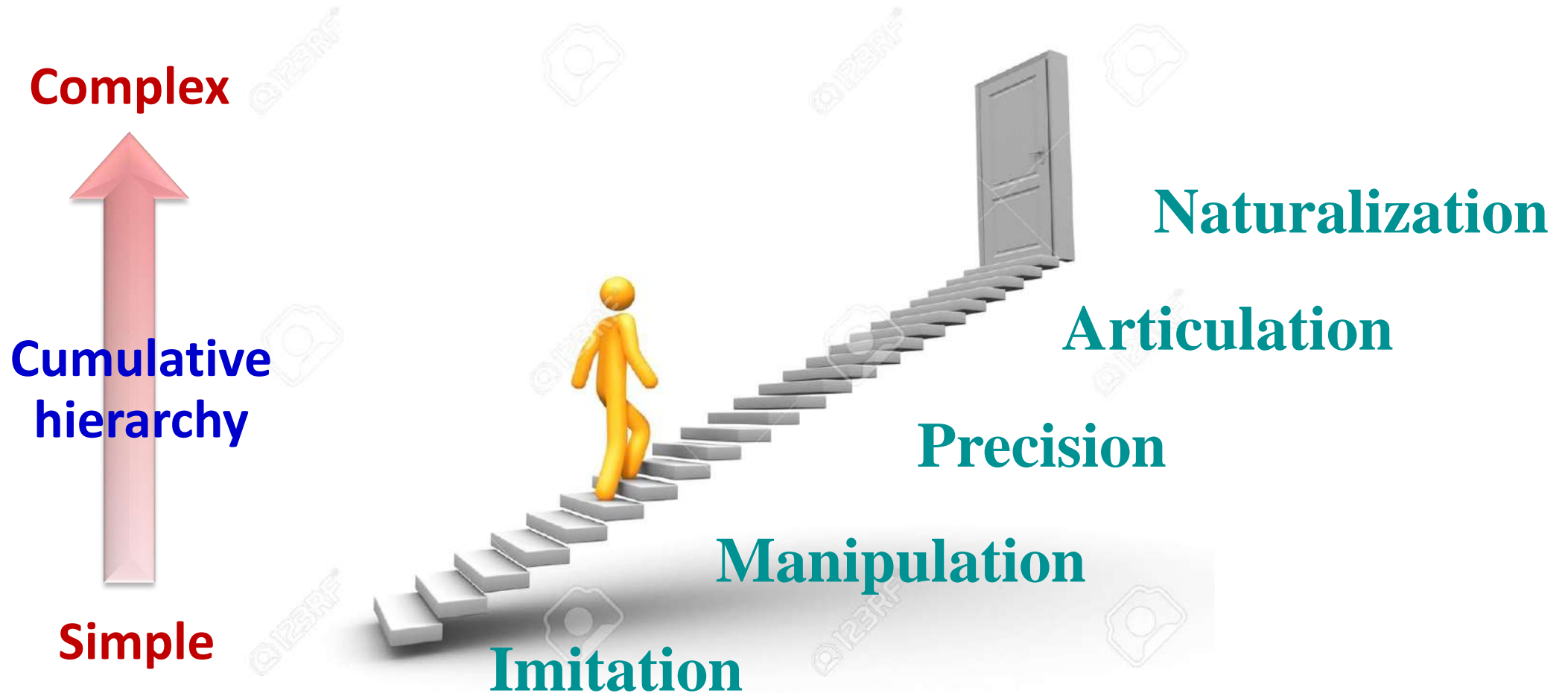- To reach a specific result

shorturl.at/uzBW6

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Perencevich, K. C., Seidel, R. J., & Kett, A. L. (2007). Psychomotor Domain. From Principles of Learning to Strategies for Instruction with Workbook Companion, 75-113.

List important psychomotor skills that students need to learn in your field

Psychomotor Domain Taxonomy

Complex

Cumulative hierarchy

Simple

Naturalization

Articulation

Precision

Manipulation

Imitation

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

Dave's psychomotor domain taxonomy (1)

Level	Category	Behaviors Description	Demonstration
1	**Imitation** (copy)	Learning by watching and imitating actions	Watch someone and replicate action, process or activity
2	**Manipulation** (follow instructions)	Actions performed through memorized instructions	Carry out task independently with some control
3	**Precision** (develop precision)	Performance becomes more exact, and action are more precise	• Perform a task or activity with expertise / high quality without assistance or instructions • Demonstrate an activity to others

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

Dave's psychomotor domain taxonomy (2)

Level	Category	Behaviors Description	Demonstration
4	**Articulation** (combine, integrate related skills)	Several skills can be performed together in a harmonious way	Relate and combine associated activities to meet varying, novel requirements
5	**Naturalization** (automate, become expert)	Mastery performance achieved with actions becoming second nature	Improvise actions in the faces of unexpected events

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

Naturalization

Articulation

Precision

Manipulation
Imitation

Origination

Adaptation

Complex Overt Response
Mechanism

Guided Response

Set
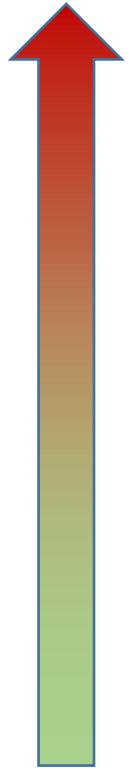
Perception

Dave's taxonomy (1970)

Elizabeth Simpson's taxonomy (1972)

Simpson, E. J. (1972). The classification of educational objectives in the psychomotor domain: The psychomotor domain. Vol. 3. Washington, DC: Gryphon House.

task **3**

How to improve your students' Psychomotor skills

Psychomotor skill variable

Motivation

Demonstration

Physical Practice

Mental Practice

Feedback/ Knowledge of result

Teaching process

1) Create interest through the use of questioning and discussion of a puzzling problem or aspect of the skill to be developed

2) Provide a demonstration of the skill

3) Have students practice the skill

4) Ask students to describe the appropriate steps in performing the skills

5) Provide alternating sessions of practice and evaluation

Osborne, E. D. (1986). Teaching Strategies for Developing Psychomotor Skills. *NACTA Journal*, *30*(1), 54-57.

Peyton's four-step approach (1998)

1) Demonstration

Instructor demonstrates the skill at normal speed and without additional comments.

2) Deconstruction

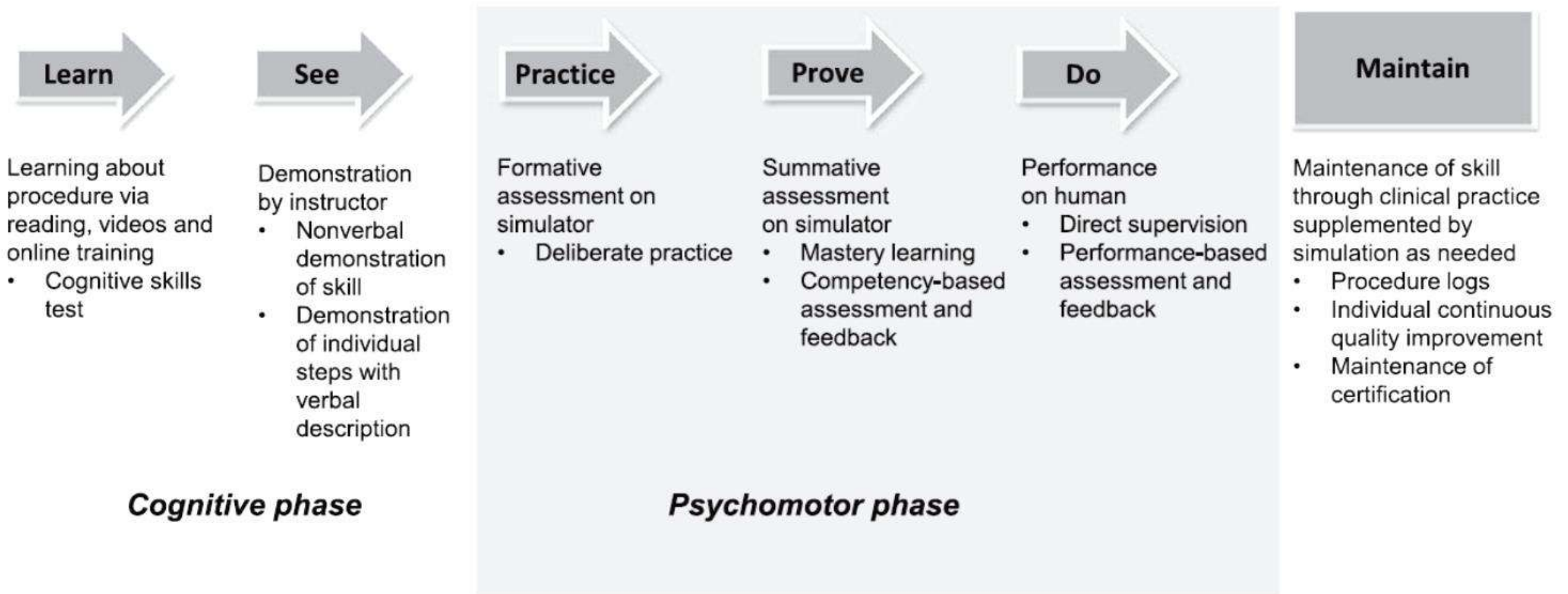Instructor demonstrates the skill by breaking it down into simple steps while describing each step.

3) Formulation

Instructor demonstrates the skill while the learner "talks through" the steps.

4) Performance

Learner demonstrates the skill while describing each step.

Walker M, Peyton JWR. Teaching in theatre. In: Peyton JWR, editor. Teaching and learning in medical practice. Rickmansworth: Manticore Europe Limited; 1998. p. 171–80.

Learn → **See** → **Practice** → **Prove** → **Do** → **Maintain**

Learn
Learning about procedure via reading, videos and online training
- Cognitive skills test

See
Demonstration by instructor
- Nonverbal demonstration of skill
- Demonstration of individual steps with verbal description

Practice
Formative assessment on simulator
- Deliberate practice

Prove
Summative assessment on simulator
- Mastery learning
- Competency-based assessment and feedback

Do
Performance on human
- Direct supervision
- Performance-based assessment and feedback

Maintain
Maintenance of skill through clinical practice supplemented by simulation as needed
- Procedure logs
- Individual continuous quality improvement
- Maintenance of certification

Cognitive phase   *Psychomotor phase*

A proposed pedagogical framework for procedural skill training in medicine

Sawyer, T., White, M., Zaveri, P., et al. (2015). Learn, see, practice, prove, do, maintain: An evidence-based pedagogical framework for procedural skill training in medicine. Acad Med, 90(8), 1025-1033.

Which level of psychomotor skill that we would like students to achieve?

Naturalization

Articulation

Precision

Manipulation

Imitation
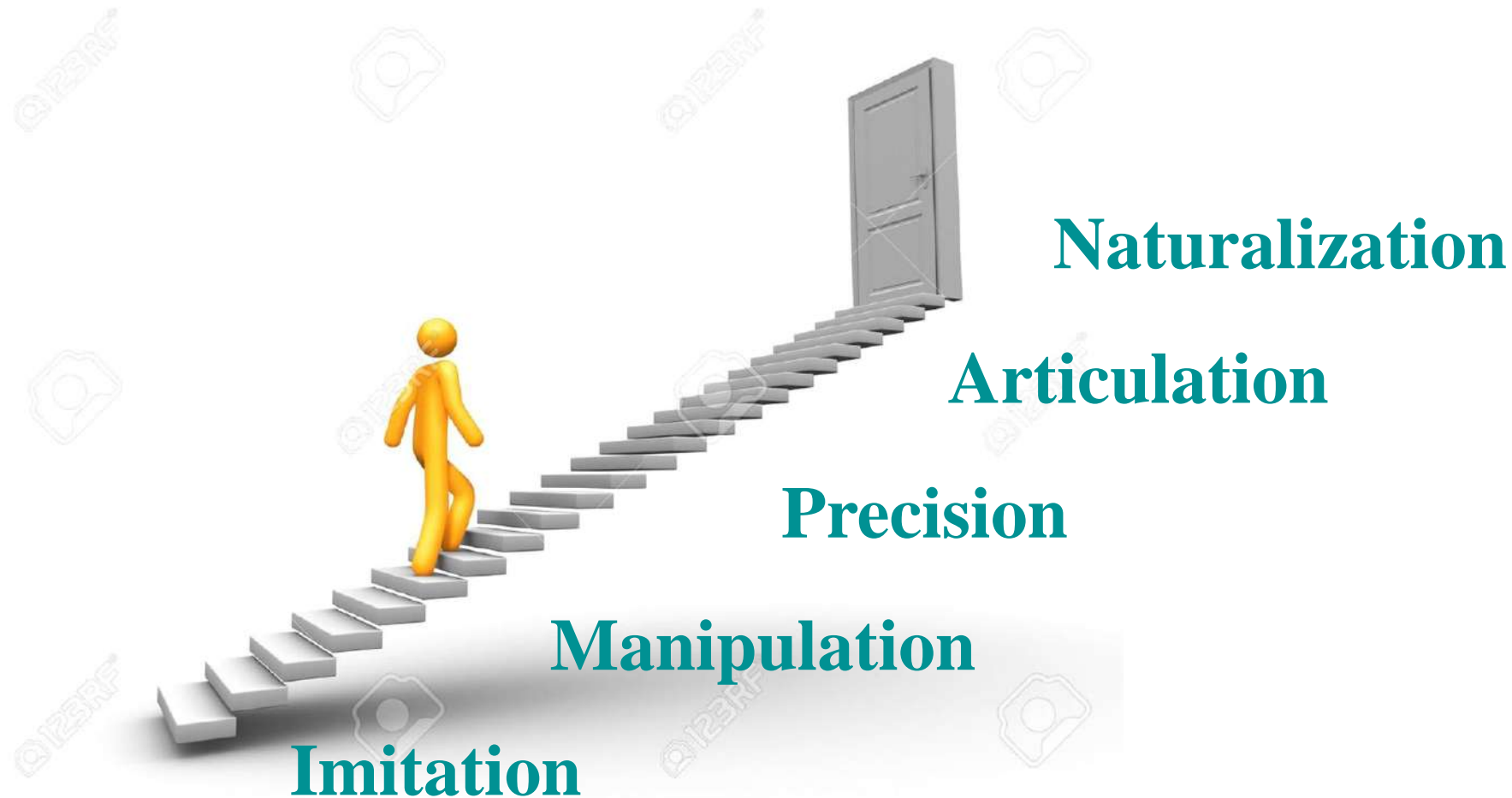
Example of innovation for psychomotor skills learning

ULTRASOUND-GUIDED PERICARDIOCENTESIS MODEL

This model allows students to insert the needle under ultrasound guidance, puncture the "pericardial sac" and aspirate pericardial fluid.

Aung, L.H., Nopparatjamjomras, T.R. and Nopparatjamjomras, S., 2017, September. MEDICAL DOCTORS'PROCEDURAL SKILL PERFORMANCE AND ATTITUDE TOWARD ULTRASOUND-GUIDED PERICARDIOCENTESIS MODEL. In Proceedings of the International Conference on Applied Science and Health (No. 2, pp. 27-33).

Micromastery

Micro Mastery :
"Learn Small, Learn Fast, and Unlock Your Potential to Achieve Anything"
(Robert Twigger)

The micro-mastery encourages us to master small skills before attempting to learn the whole thing.

micro mastery
Learn Small, Learn Fast, and Unlock Your Potential to Achieve Anything
ROBERT TWIGGER
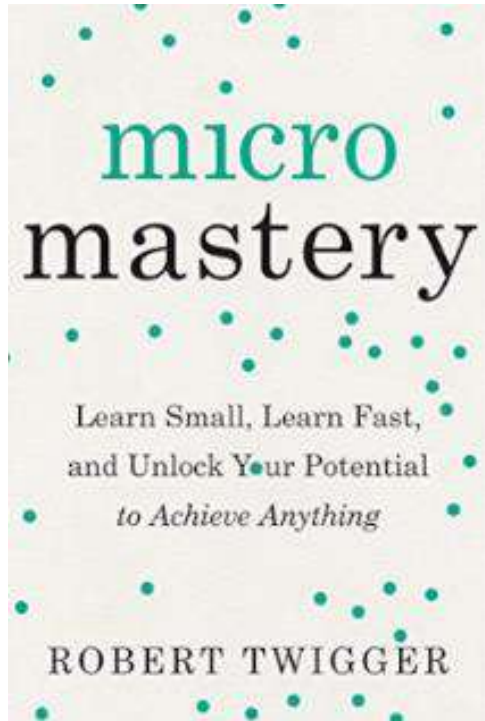
10,000 hours Rule :

"If we want to become experts in a skill, we must practice it for 10,000 hours, and that dream will come true."

(K. Anders Ericsson)

10,000 hours rule
Expert-level Performance
K. Anders Ericsson

If we practice anything without a plan or key concept, we may achieve success slowly and may even fail or give up.

The entry trick (an initial piece of information)

Quick way to get basic grip on the matter

Example: What is the entry trick to make an omelet **fluffy** and **crispy**?

Trick I: *Use* a tall pot and *Pour* the beaten eggs through a sieve

Trick II: *Beat* the eggs with a little bit of milk or water

Trick III: …………

These components were suggested by Robert Twigger.

Repeatable
Being able to repeat and *get better* at doing it.

Payoff
Success *incentives* that make people want to repeat them

Experiment
Start *small* and add *zest* to repeatability

Feedback
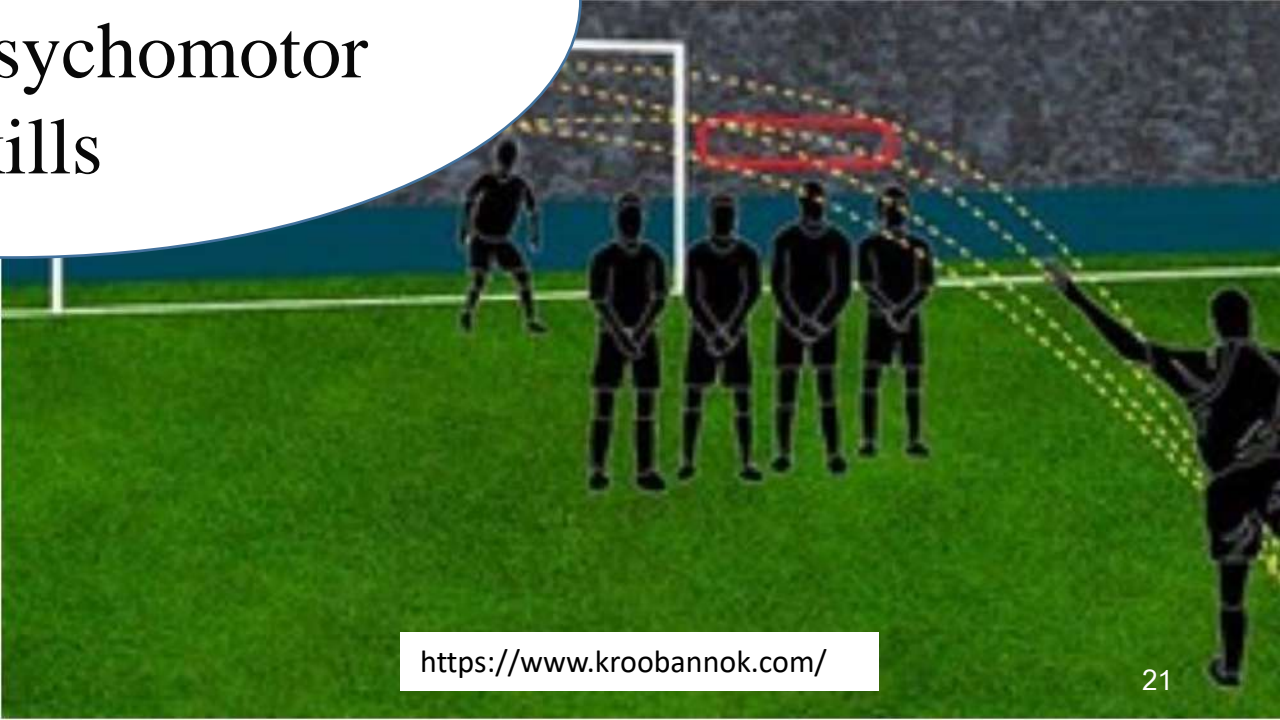Give people something to *connect* to others and earn feedback

Applying Micromastery to Develop Psychomotor Skills

https://th.lovepik.com/

https://www.pngegg.com

https://th.lovepik.com/

https://www.kroobannok.com/
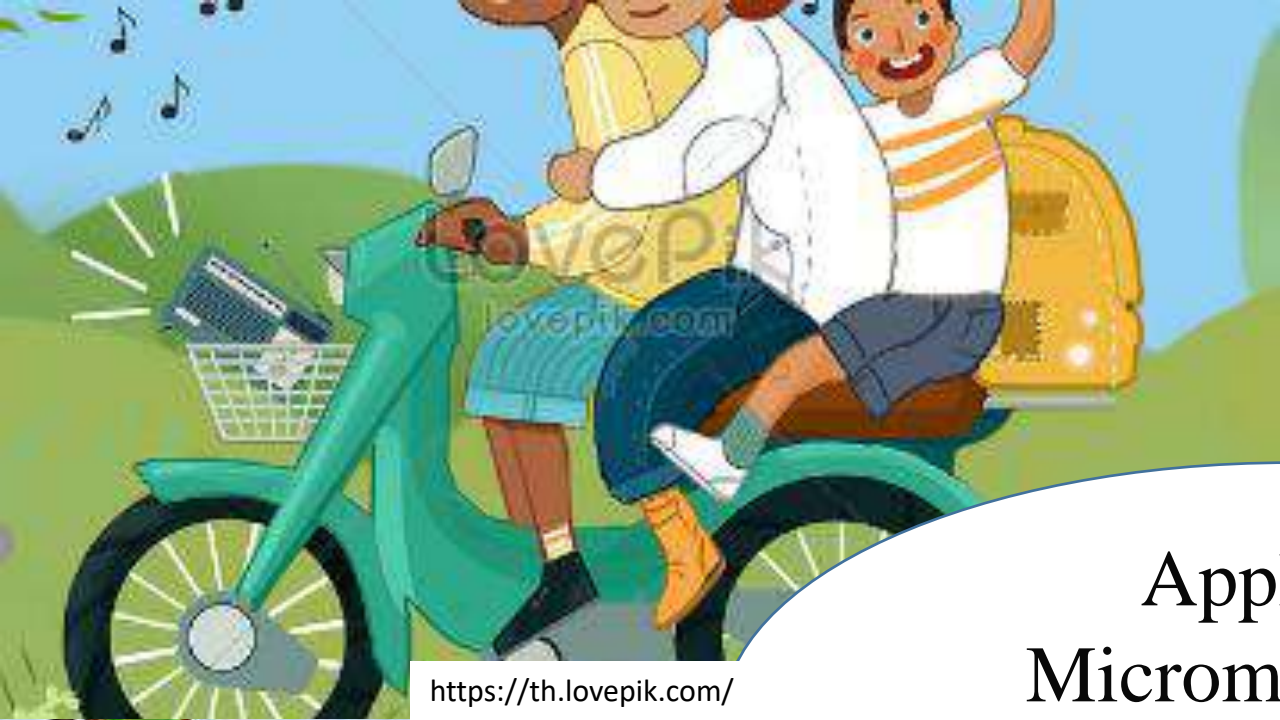
Peyton's four step approach (1998)

Building a Micro Mastery

1) Demonstration

2) Deconstruction

Instructor demonstrates the skill by breaking it down into simple steps, while describing each step.
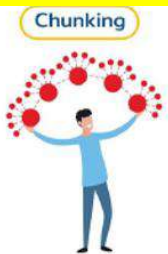
3) Formulation

4) Performance

Chunking

1. Break down into steps
2. Prioritize them
3. Practice each step
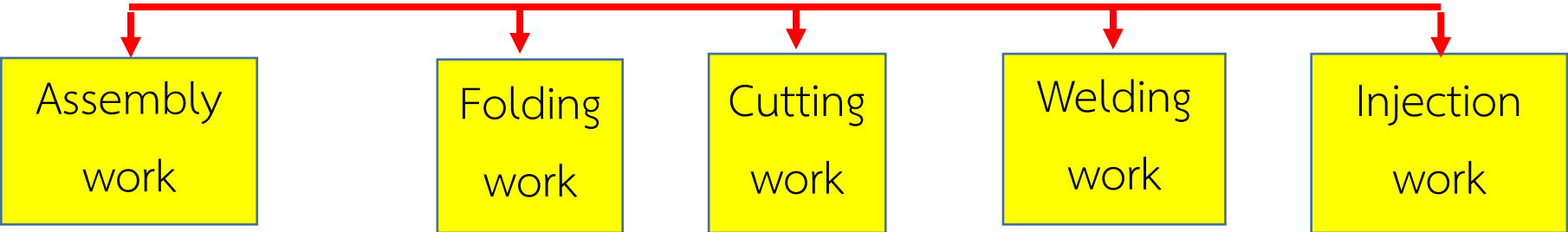4. Combine the steps

Walker M, Petyon JWR. Teaching in theatre. In: Peyton JWR, editor. Teaching and learning in medical practice. Rickmansworth: Manticore Europe Limited; 1998. p. 171–80.
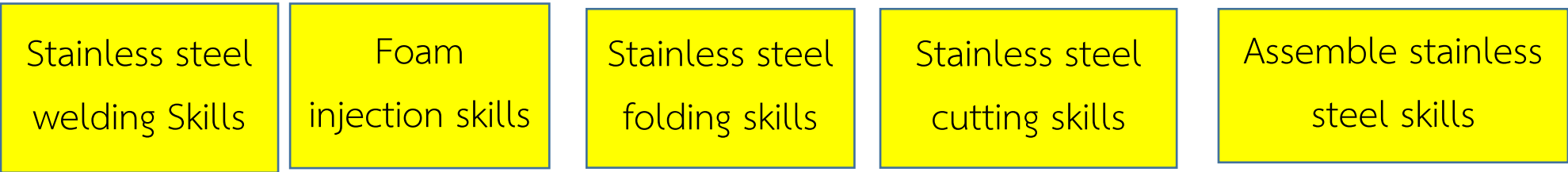
Applying Micromastery to Develop Psychomotor Skills

Chunking

Seafood showcase

1. Break down into steps

| Assembly work | Folding work | Cutting work | Welding work | Injection work |

2. Prioritize them
3. Practice each step
(sort by importance)

| Stainless steel welding Skills | Foam injection skills | Stainless steel folding skills | Stainless steel cutting skills | Assemble stainless steel skills |

4. Combine the steps
(according to the actual production flow)

Cutting work → Folding work → Foam injection work → Welding work → Assembly work →
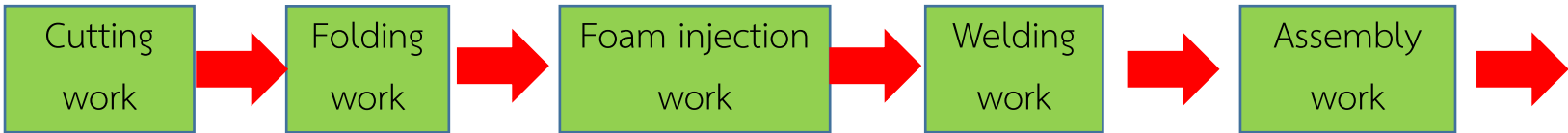
Seafood showcase

Thank you