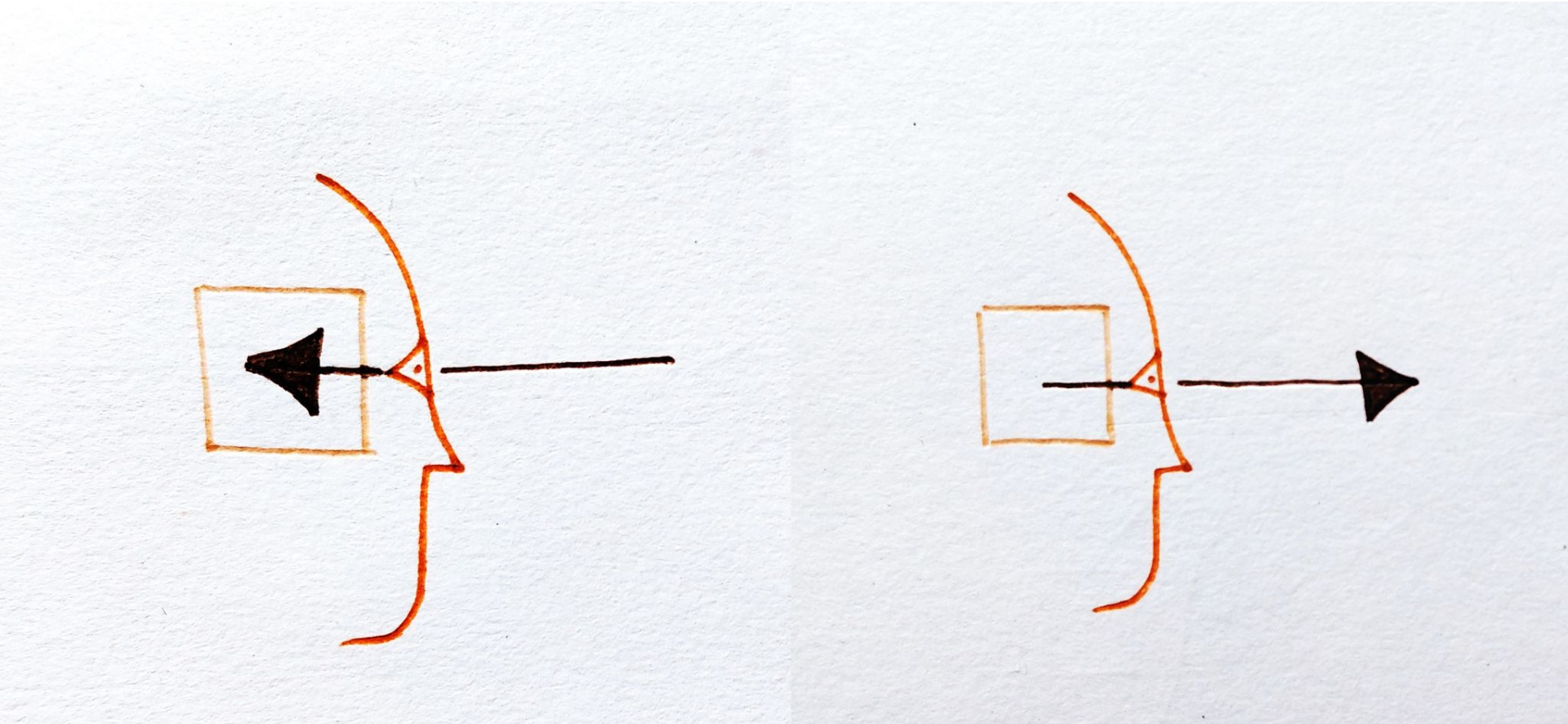
# Teaching with students:

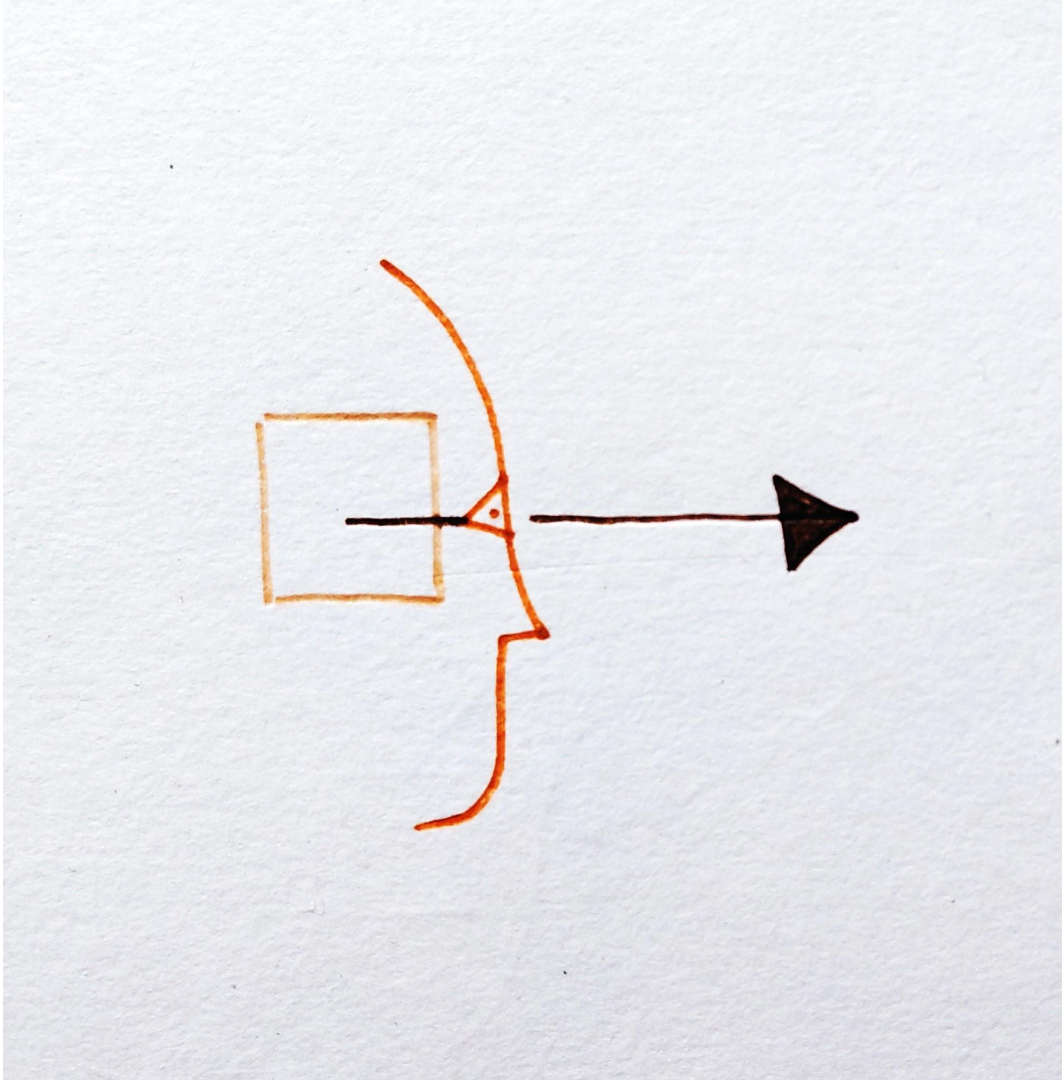
## The third way pedagogy from cybernetics and enactivism

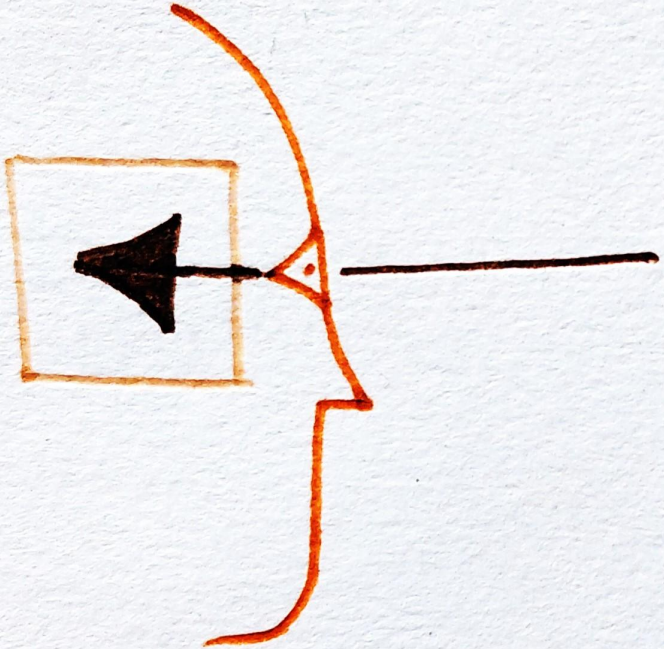


## Exploring with students

**An emphasis on:**

- Problem solving before teaching
- Success through productive struggle and experience





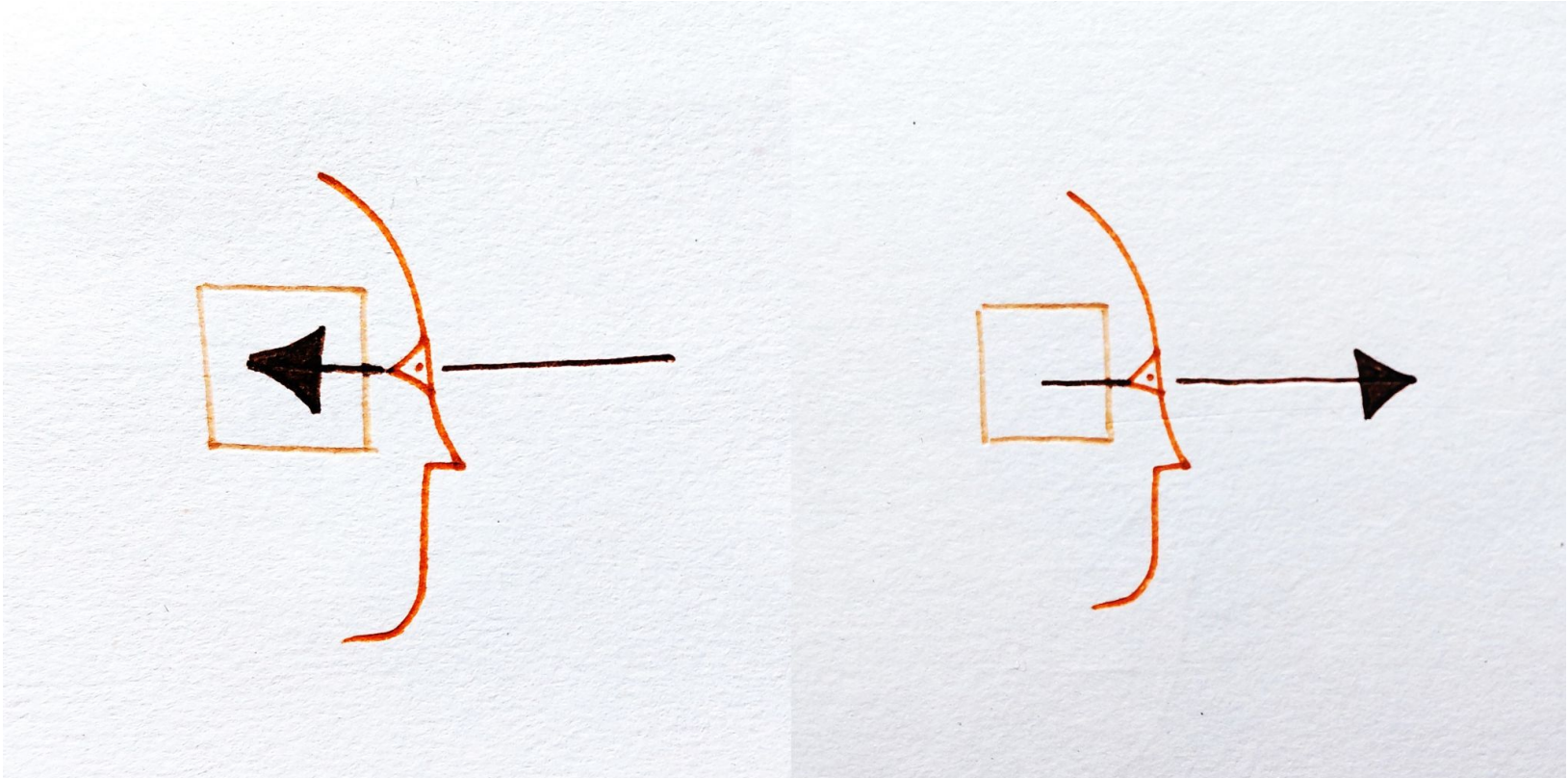
## Teaching to students

**An emphasis on:**

- “Just telling” students.
- Success through practising predefined correct answers and procedures

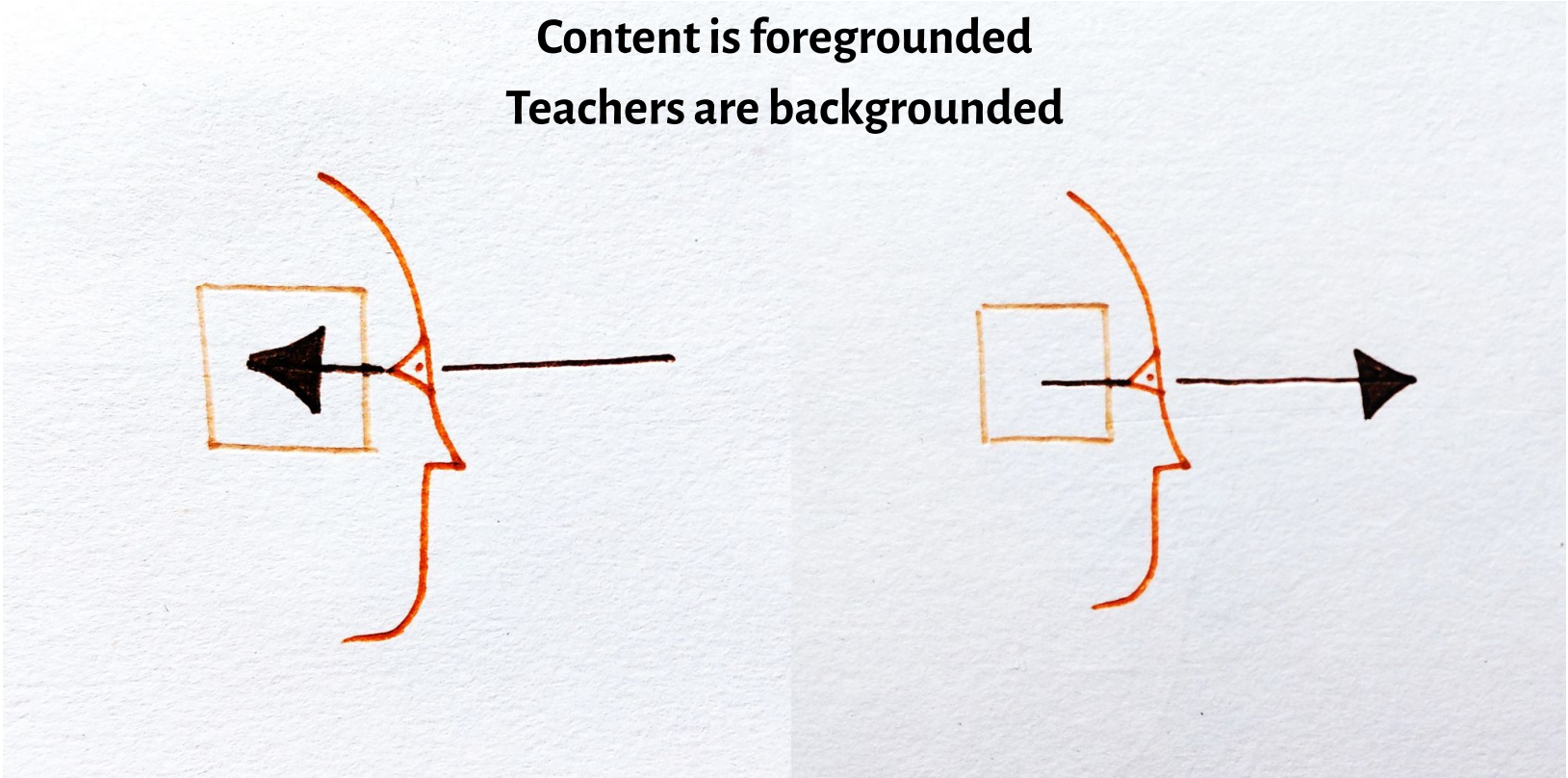
The **teachers** transmit the content

The **students** explore the content



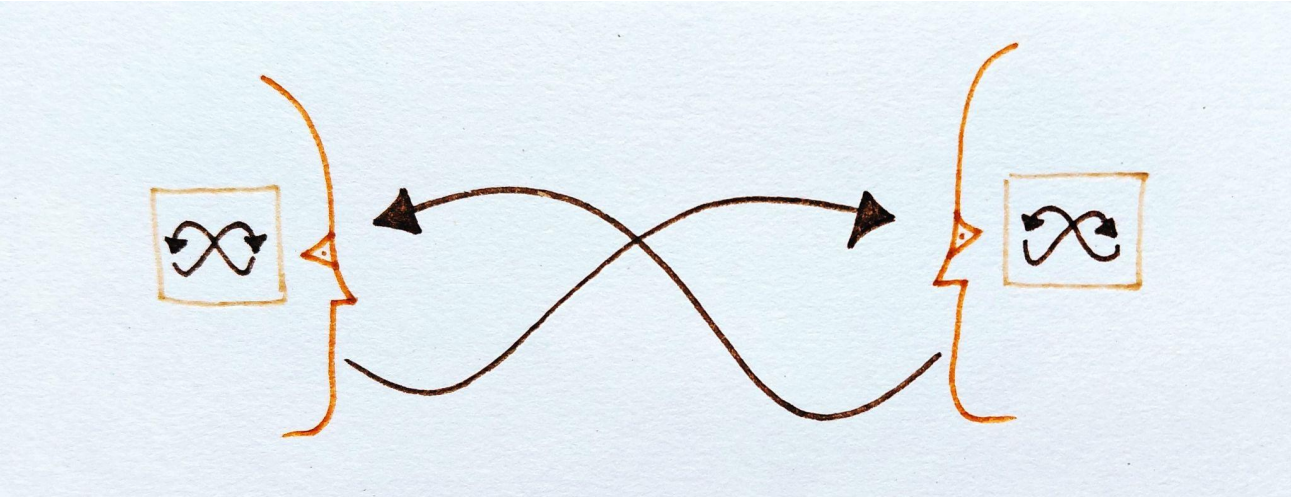
The **teachers** transmit the content

The **students** explore the content



Everything said is said **by someone**

Everything said is said **to someone**



# Two premises

Everything said is said **by someone**

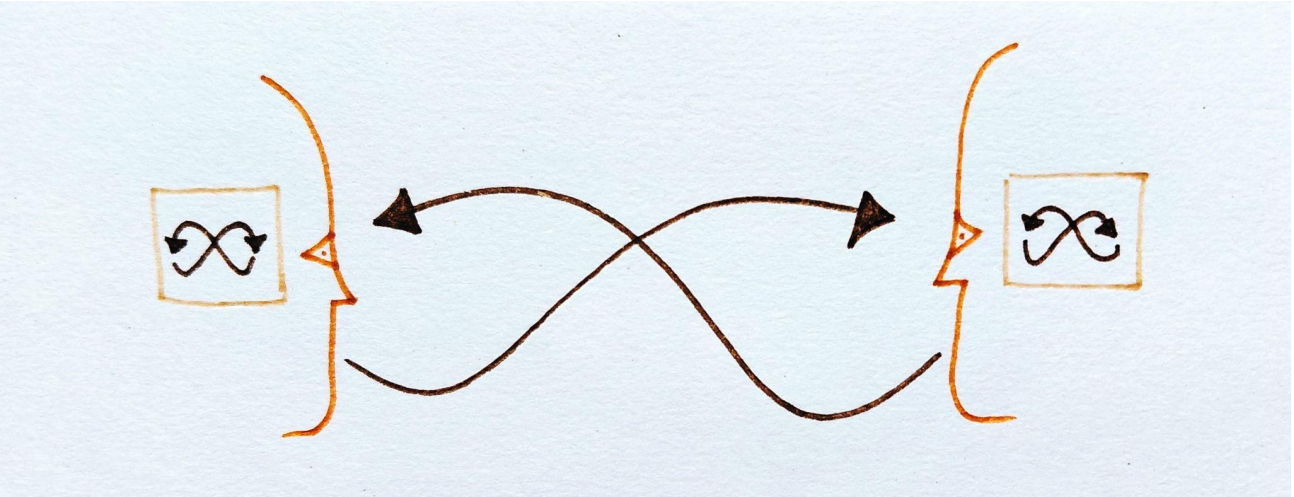
**Autonomy:**

*There are no meanings out there*

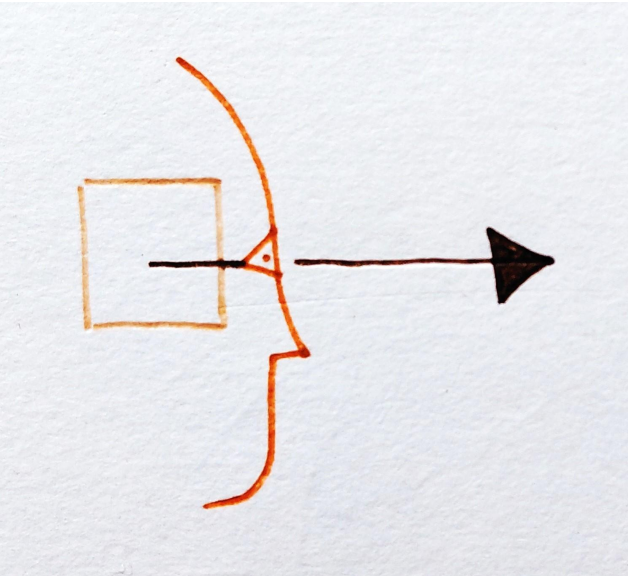
Everything said is said **to someone**

**Structural coupling:**

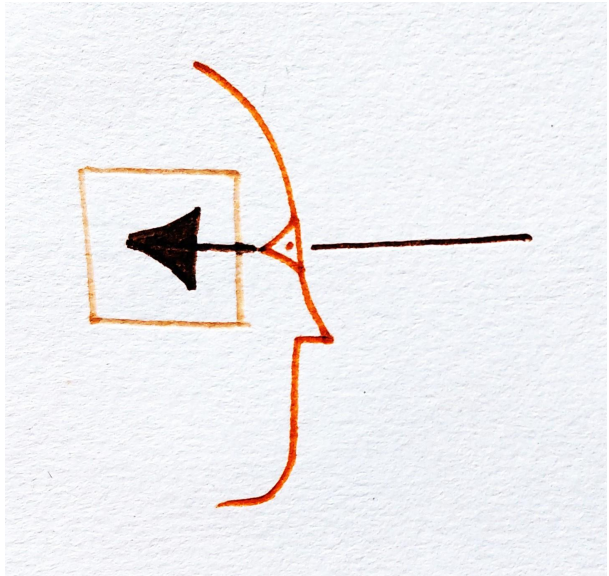
*Students learn their teacher's way of doing a subject*



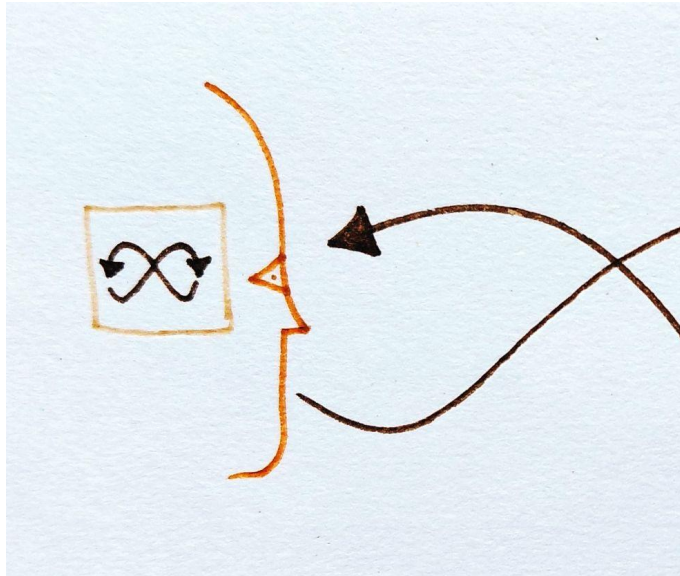
The **students** explore subject content

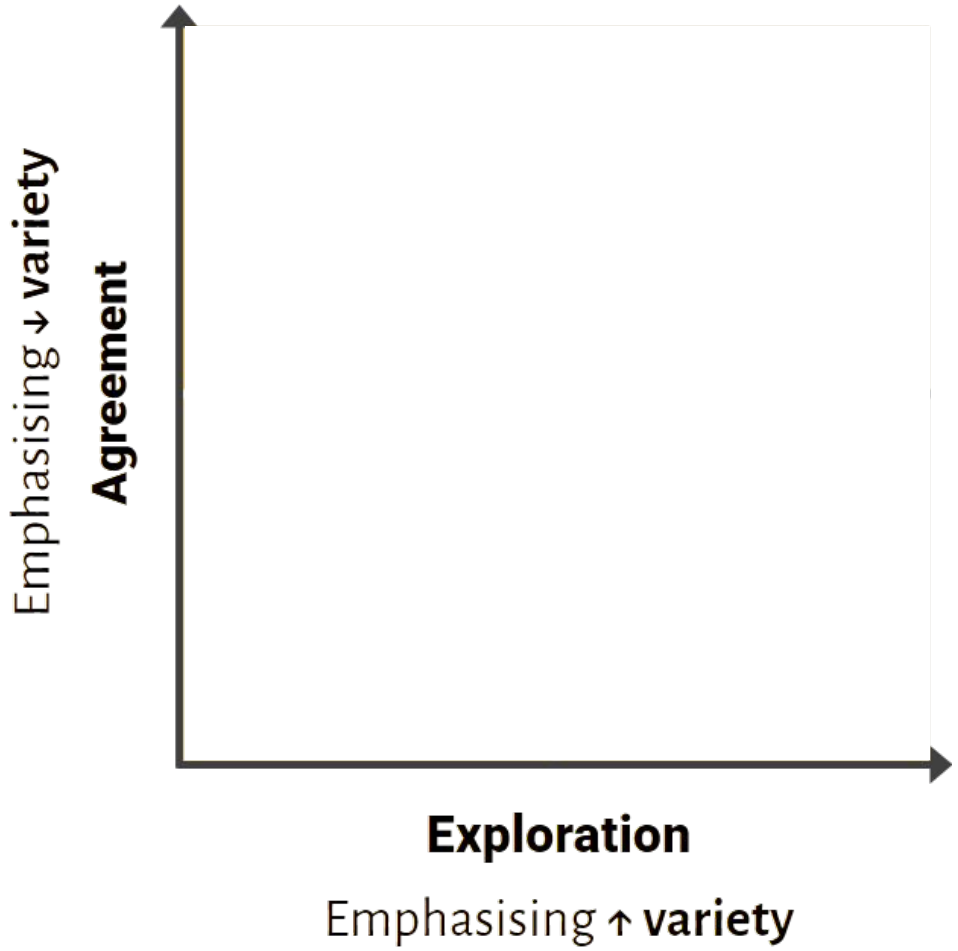


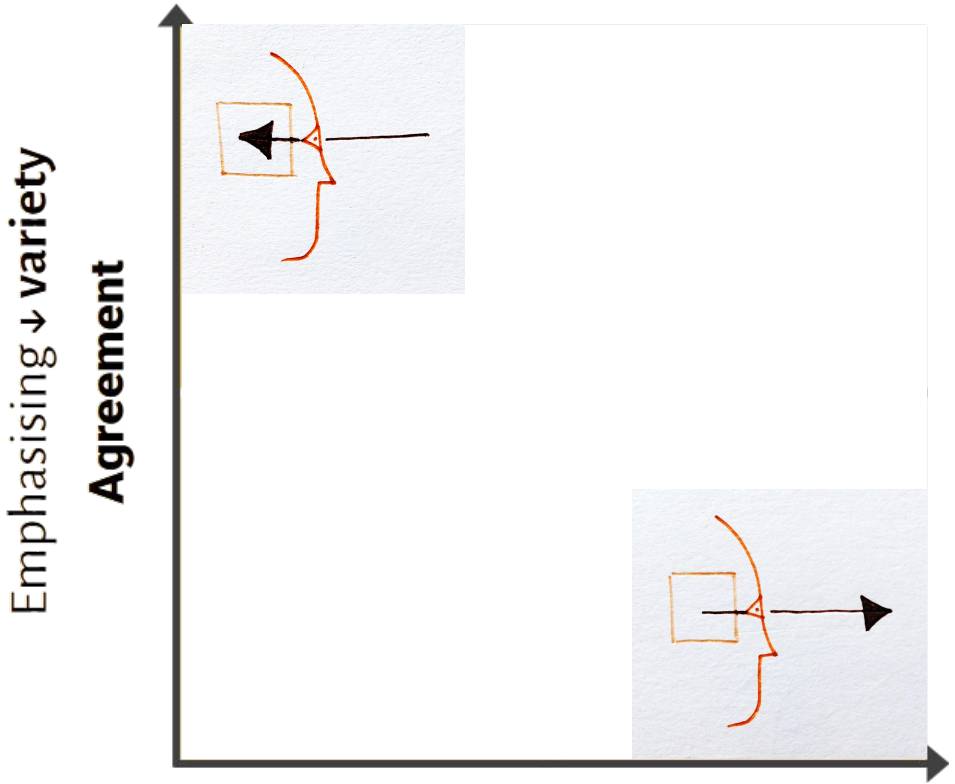
The **teachers** have students agree on subject content

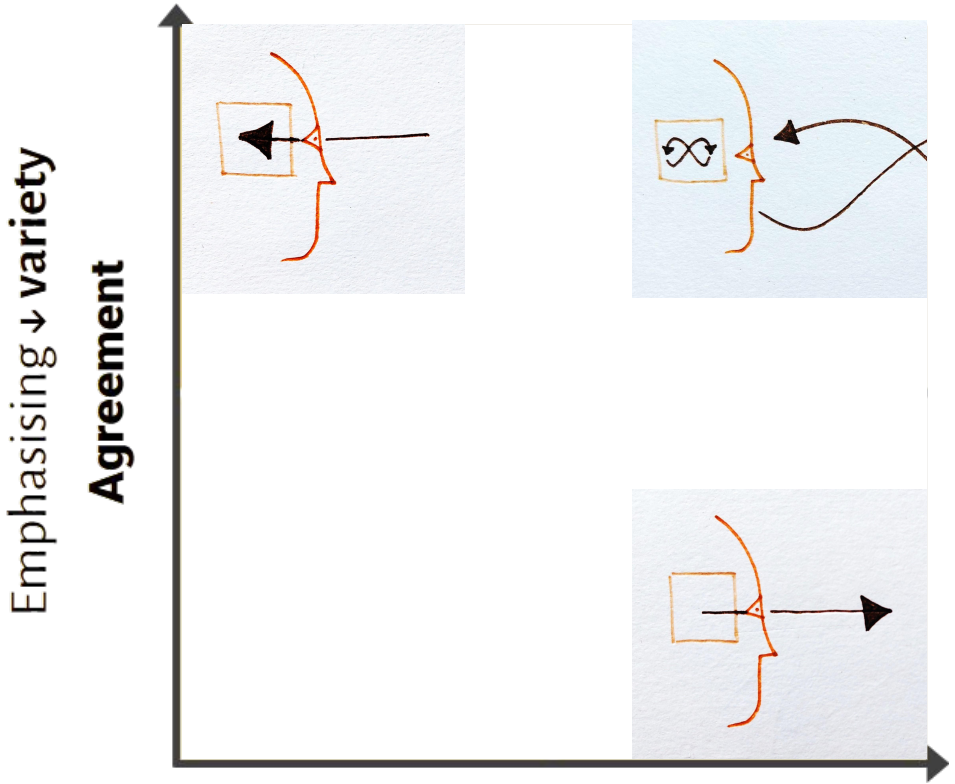


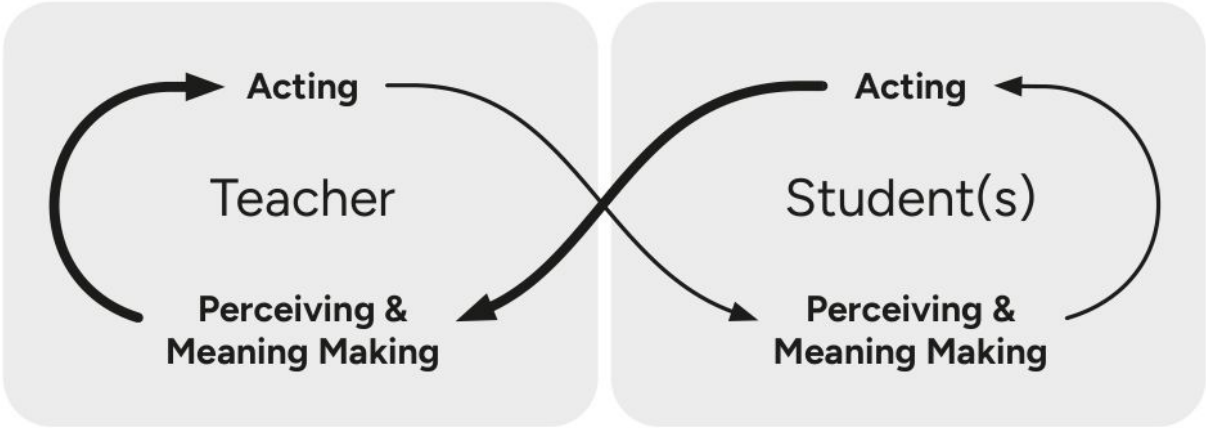
**Teachers** and **students** coordinate a way of doing subject content




Emphasising ↓ variety
Agreement
Exploration
Emphasising ↑ variety

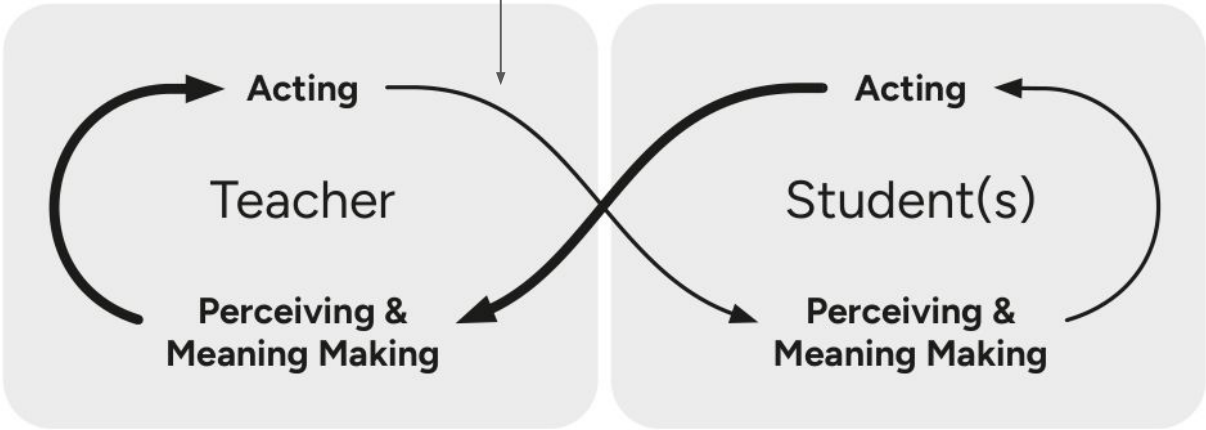

Emphasising ↓ variety
Agreement
Exploration
Emphasising ↑ variety


Emphasising ↓ variety
Agreement
Exploration
Emphasising ↑ variety


Acting
Teacher
Perceiving &
Meaning Making
Acting
Student(s)
Perceiving &
Meaning Making

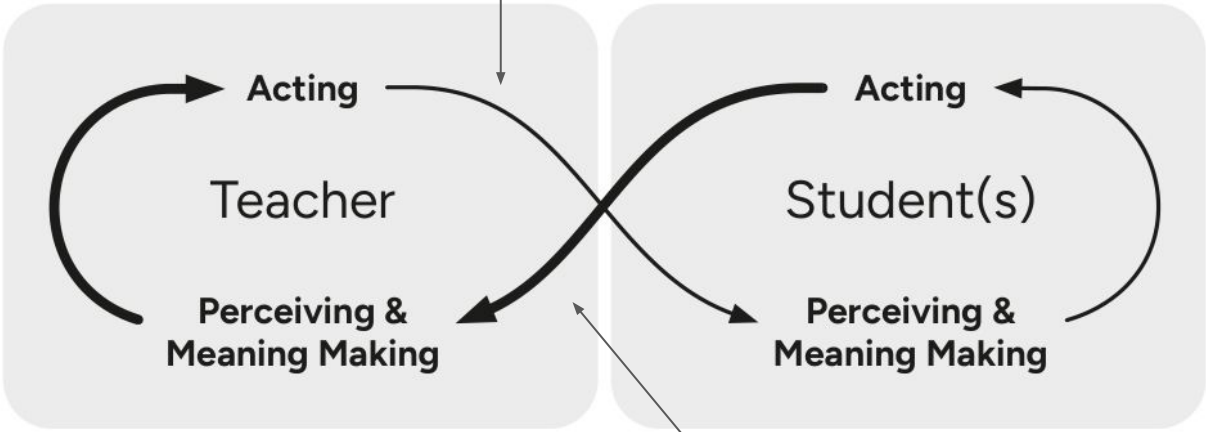
**Agreement: ↓ variety** (of possible understandings)

Clear communication



## Agreement: ↓ variety

Clear communication




## Exploration: ↑ variety

Students to express and explore understandings

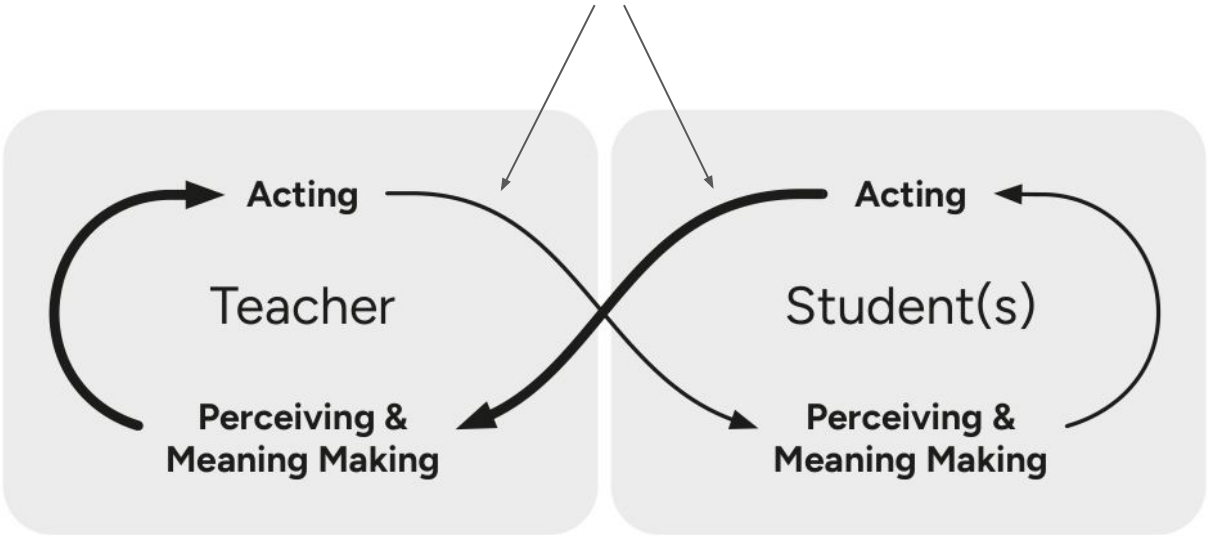
↓ **variety**

**Question:** How would X be different (from normal) if I changed it in this way?
**Expectation:** Choice of A, B, or C.

↑ **variety**

**Following question:** Why did you choose your answer?
**Expectation:** Open answer.

# Teachers must: regulate the variety



# Regulating variety

**THE CAPACITY TO ENGAGE ≥ THE COMPLEXITY FACED**

↓

*student's knowledge*

*+ teacher's support*

Applied from Aulin-Ahmavaara 1978 The Law of Requisite Hierarchy

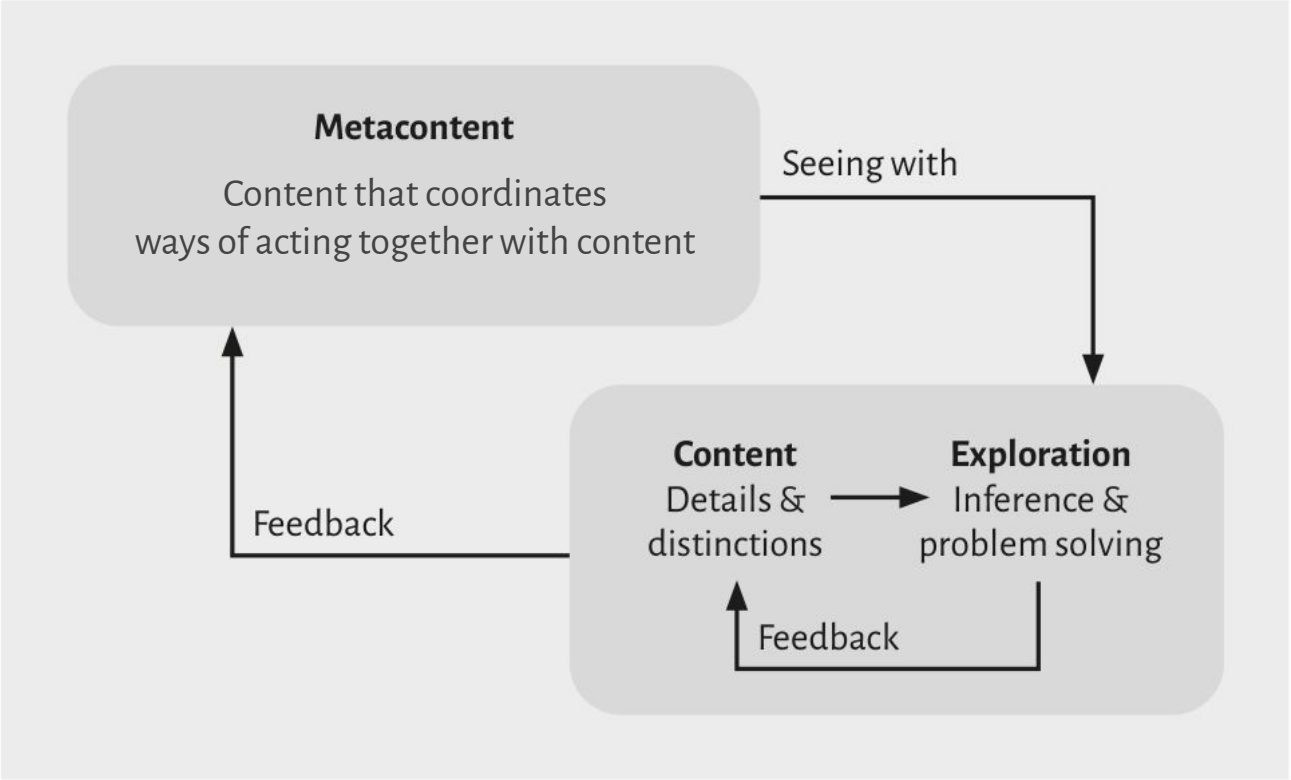
# Regulating variety

**THE CAPACITY TO ENGAGE ≥ THE COMPLEXITY FACED**

↓

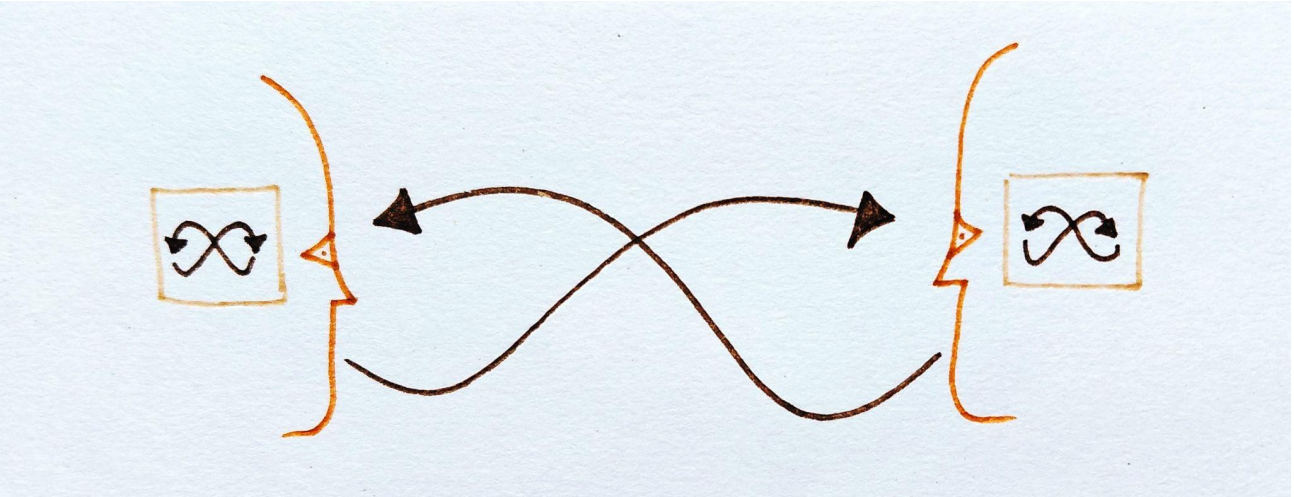
*student's relevant knowledge*
*+ student's certainty about how to act*
*+ teacher's support*
*+ teacher's certainty about how to act*

Applied from Aulin-Ahmavaara 1978 The Law of Requisite Hierarchy


Metacontent
Content that coordinates
ways of acting together with content
Seeing with
Content
Details &
distinctions
Exploration
Inference &
problem solving
Feedback
Feedback

**Examples of metacontent in my classroom:**

**Approach:** seeing content through a systems lens (rather than reductionist lens)
**Principles:** homeostasis, circular causality, requisite variety, information is a difference
**Explaining:** how to explain like a biologist (types of explanation we use)
**Forms of inquiry:** stock and flow modelling



# Teaching Meaning

Christian Moore-Anderson



## What Works When Telling Isn't Enough