On the (transformative) dialogue and dialogism in science lessons

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Summary

1. Master dissertation: concept-activity

2. PhD project: dialogic teaching intervention

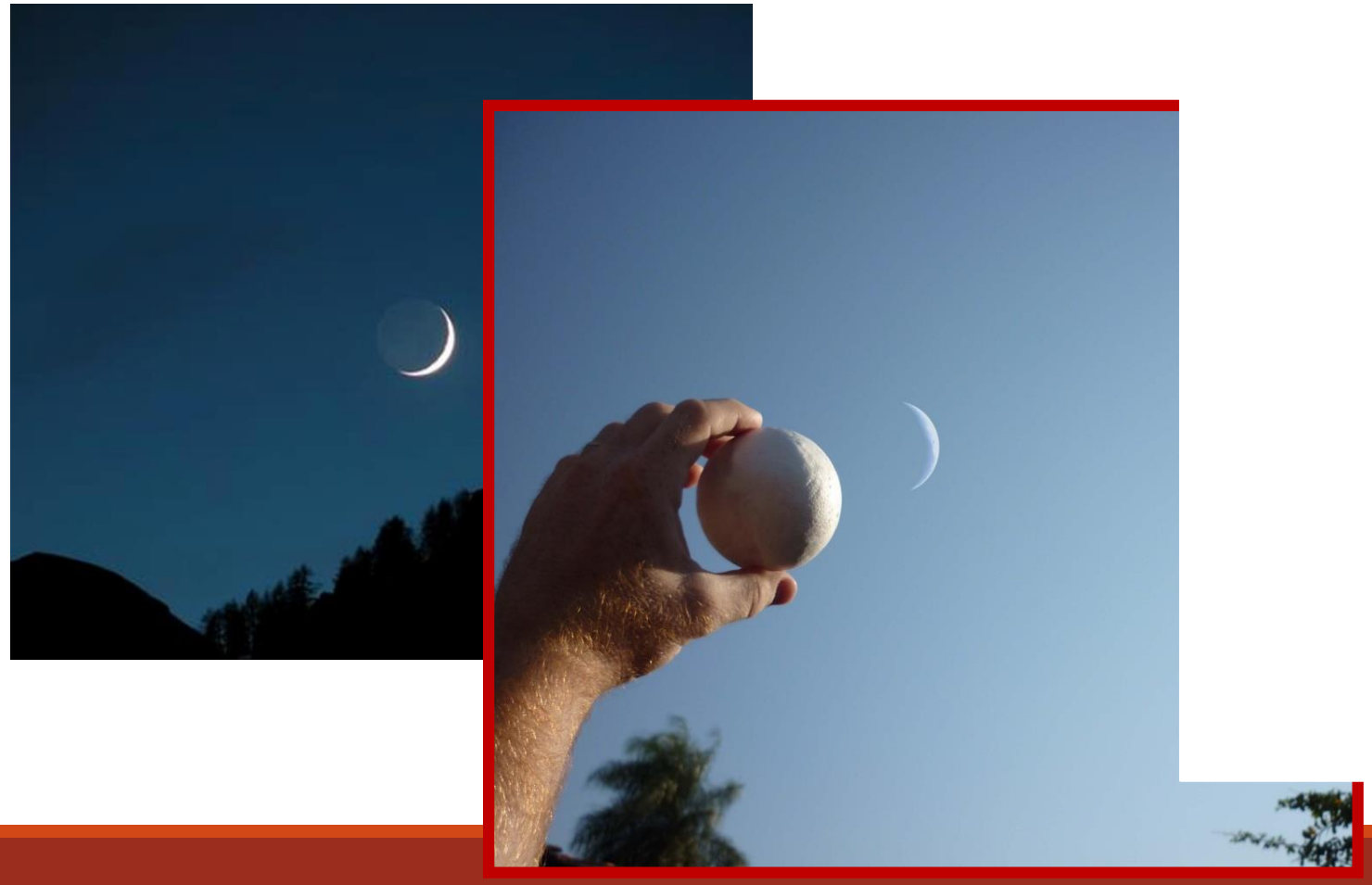
3. Strong dialogic position: concept-activity-dialogue

Summary

1. Master dissertaion: concept-activity

Supervisor: Cristiano Mattos (USP)

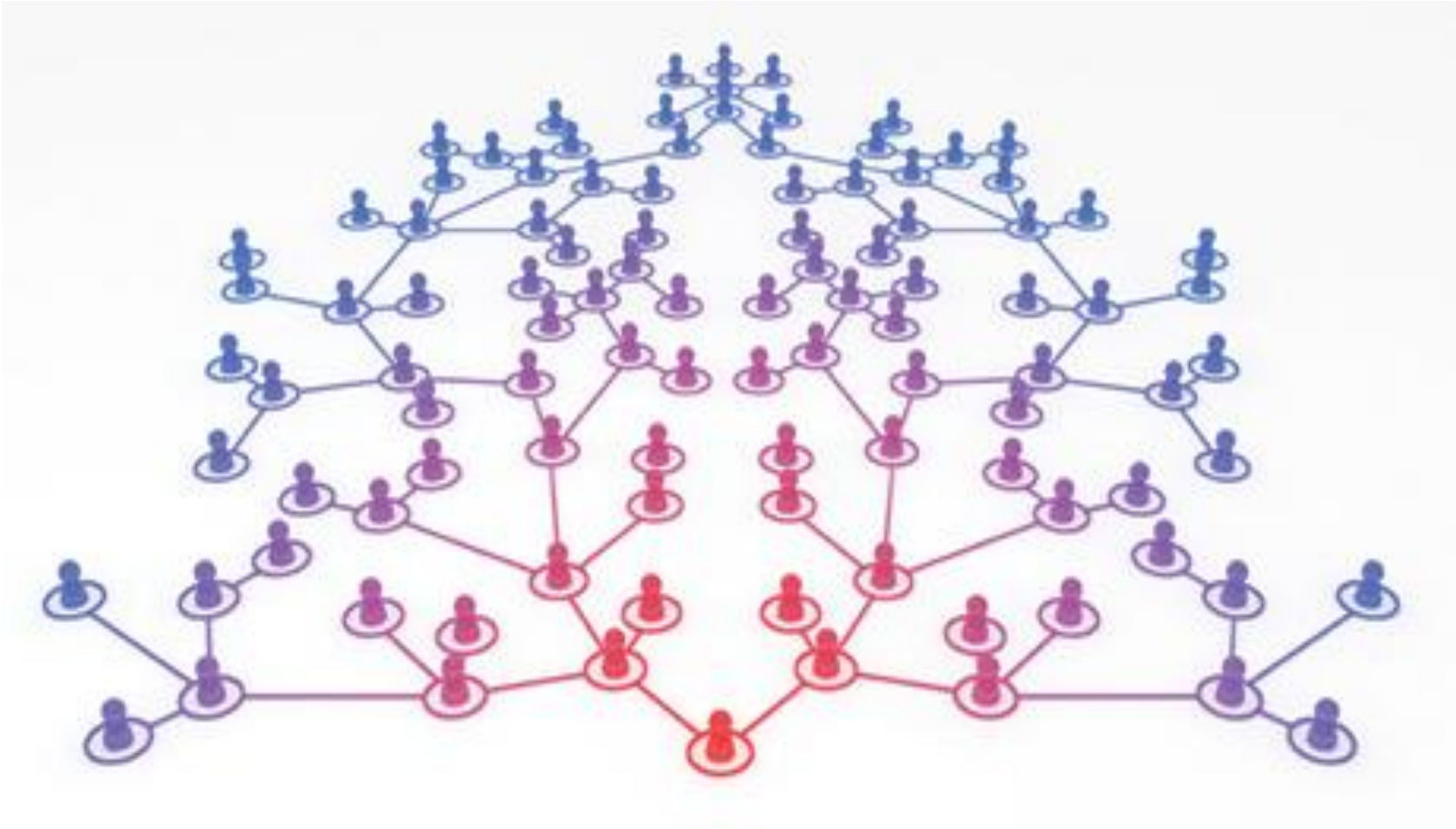
Moon phases: a persistent problem



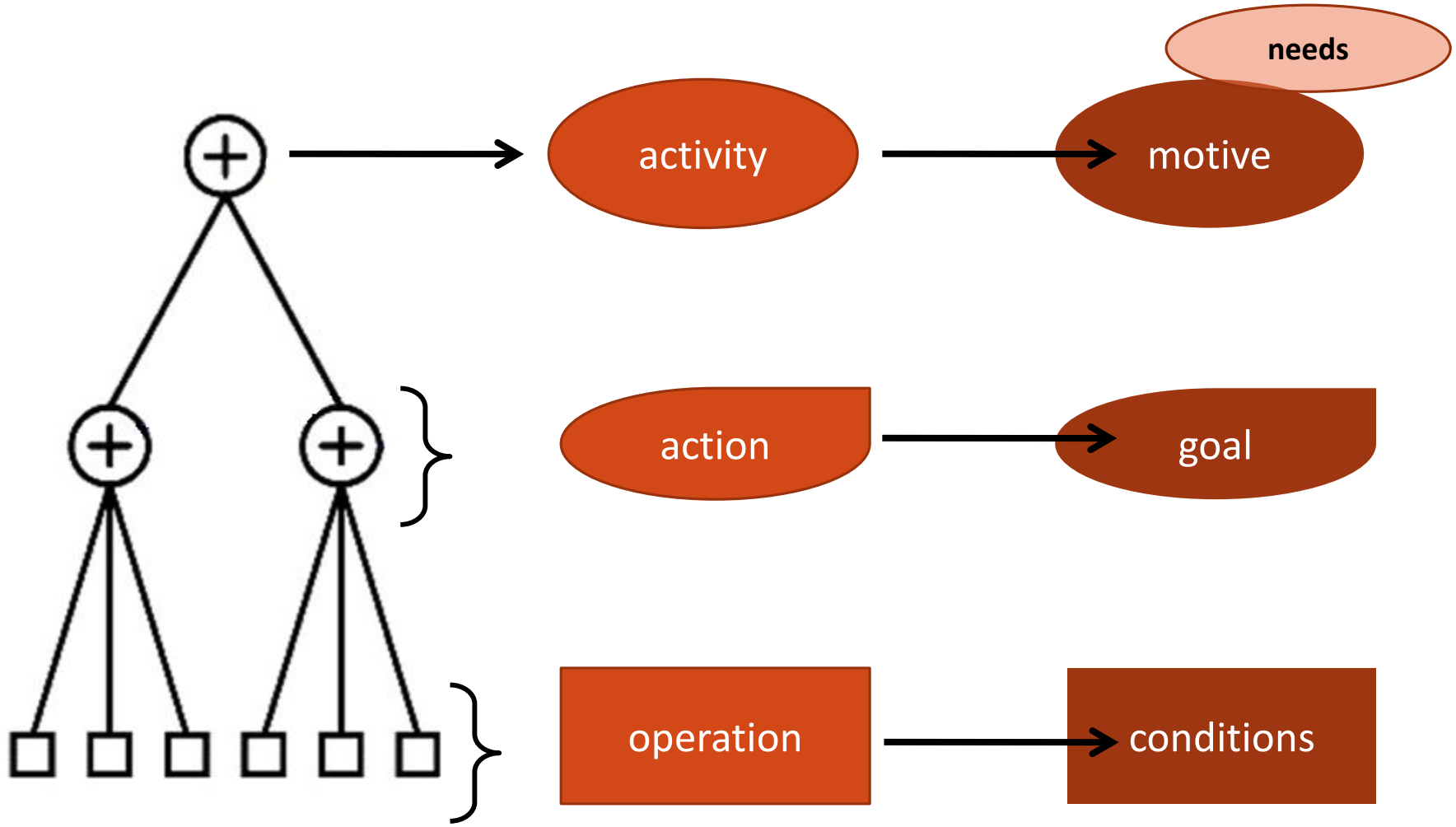
1.1 Concepts and conceptual system

Scientific concepts

Everyday concepts



1.2 Activity and actvity system



The thesis…

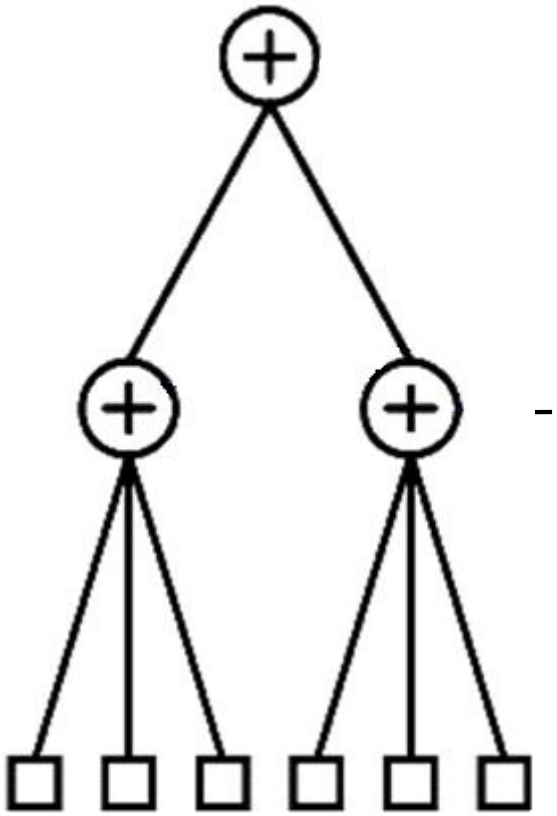
- “[…] the common structure of human activity and individual consciousness” (Leontiev, 2009, p. 98)

The thesis…

- "Thus, **spontaneity** and a **lack of conscious awareness** of concepts, **spontaneity** and the **extrasystemic nature of concepts**, are synonymous. Correspondingly, **nonspontaneous scientific concepts**, because of what makes them nonspontaneous, will be characterized from the outset by **conscious awareness**. From the outset, they will be characterized.by the presence of a system (Vygotsky [Ch6], 1987:236).

- "[…] that the concept arises and is formed in a **complex operation** that is **directed toward the resolution of some task**. They show that the simple presence of certain **external conditions** and the **mechanical establishment** of connections between objects and the word is not sufficient for the emergence of the concept. (Vygotsky [Ch5], 1987:124).

1.4 Concept-activity system



activity

???

action

scientific concepts

operation

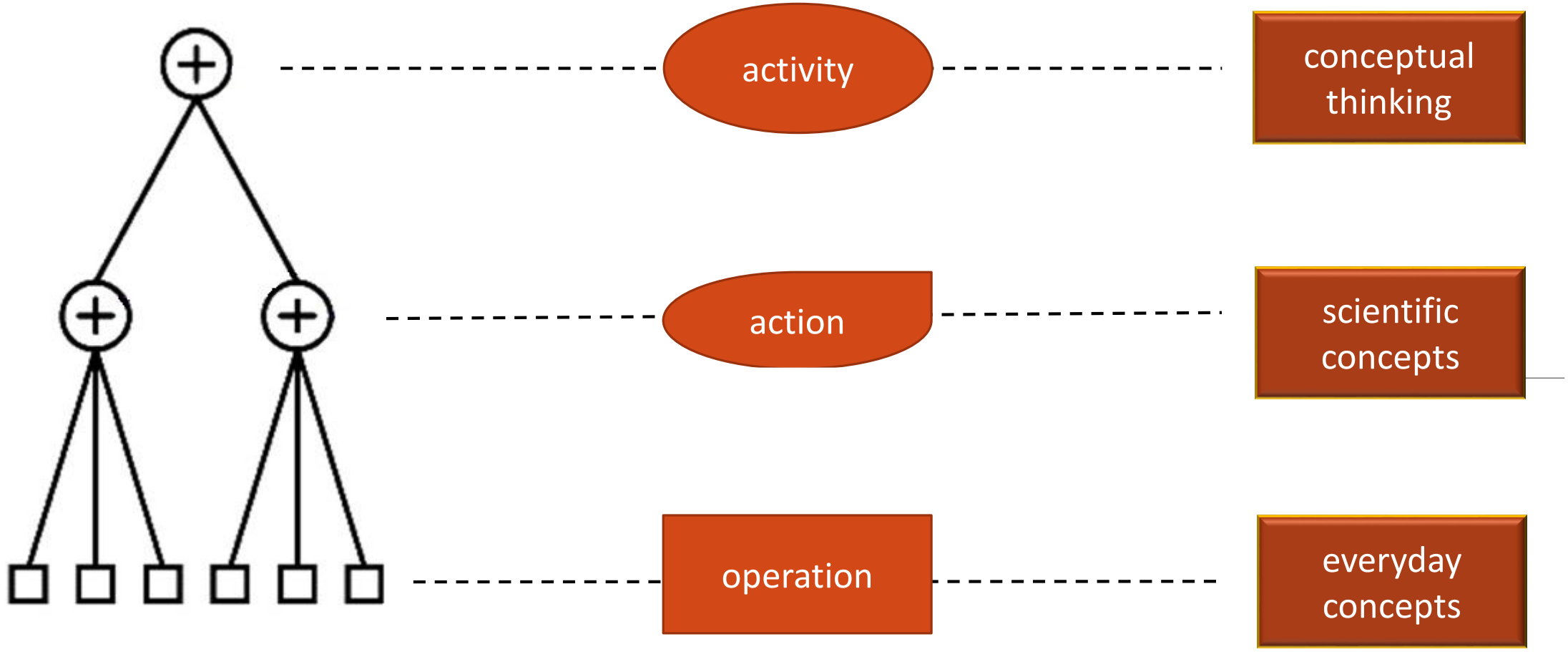
everyday concepts

- “[..] establish the fact that thinking is a human activity, and not something added to activity or its separate side. (Leontiev [L35], 2005:46).

- ” [...] Thinking, a mediated cognition, first appears not in the form of activity, but in the form of an action. [...] That is, it is not the cognitive motive that appears first, but it is the cognitive goal that appears first. (Leontiev [L35], 2005:48).

- There occurs a transformation of actions not only “upward,” when action is transformed into activity, at times into a central one for the person, that is, to what is most important. And, there is transformation “downward,” a lowering of rank. Action (and cognitive action) is capable of, according to the overall law, being transformed into operation, (Leontiev [L35], 2005:49).

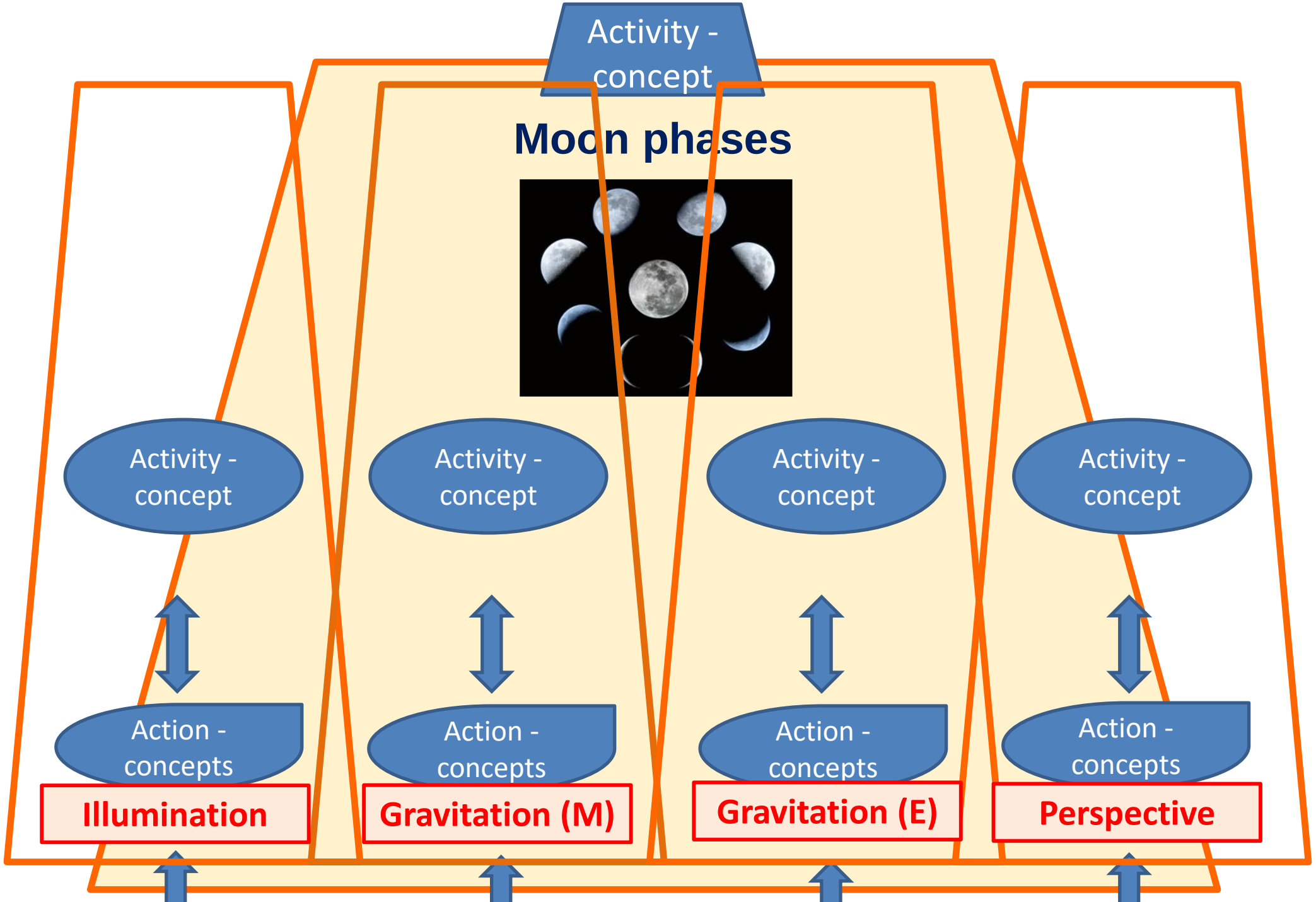
1.4 Concept-activity system



Activity - concept

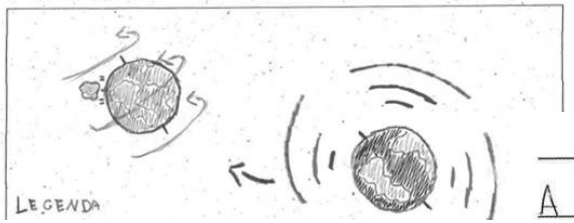
Moon phases

Action - concept	Action - concept	Action - concept	Action - concept
The moon is always illuminated by the sun	The relative position changes every day	The moon rises in different time and shape	The orbit has a small inclination
Operation - concept	Operation - concept	Operation - concept	Operation - concept
The sun always shines	Revolution of the moon	Rotation of the Earth	The eclipses are rare

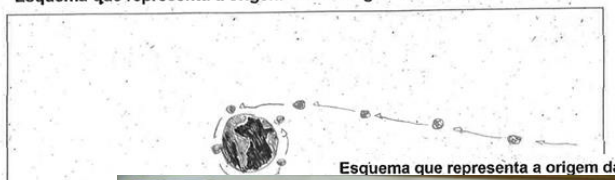

Activity - concept
Moon phases
Activity - concept
Activity - concept
Activity - concept
Activity - concept
Action - concepts
Action - concepts
Action - concepts
Action - concepts
Illumination
Gravitation (M)
Gravitation (E)
Perspective

Esquema que representa a origem da Lua segundo a teoria 1

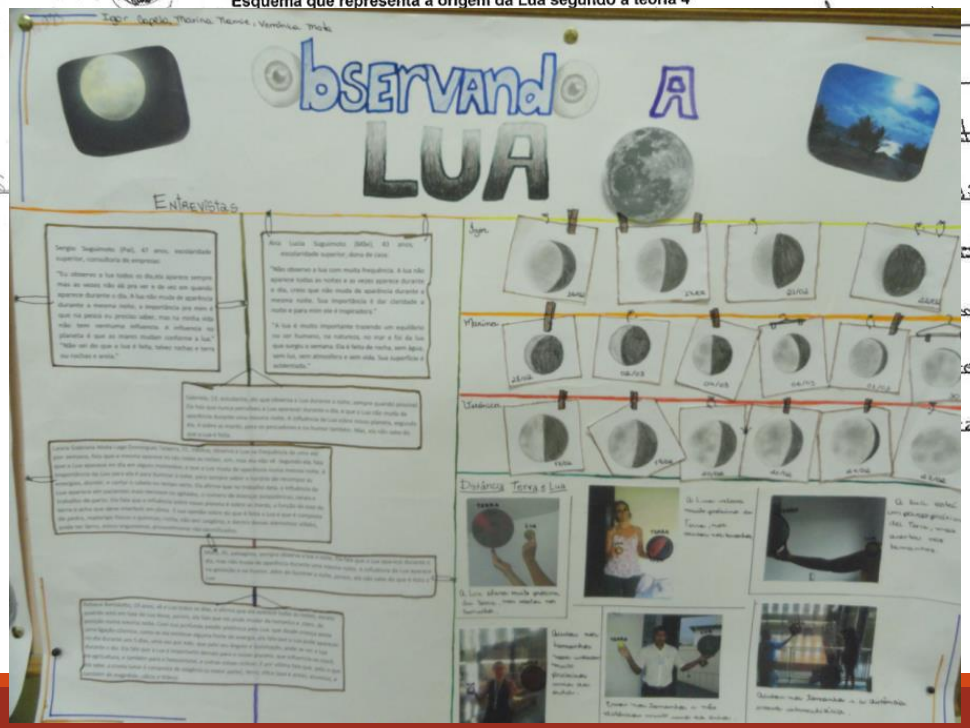
Esquema que representa a origem da Lua segundo a teoria 2



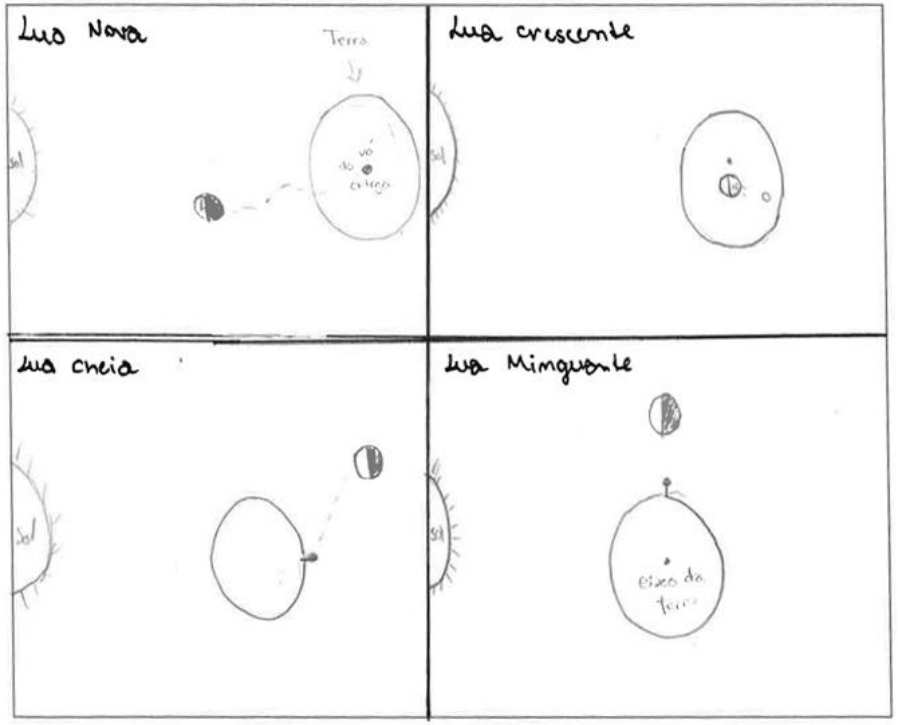
Esquema que representa a origem da Lua segundo a teoria 3

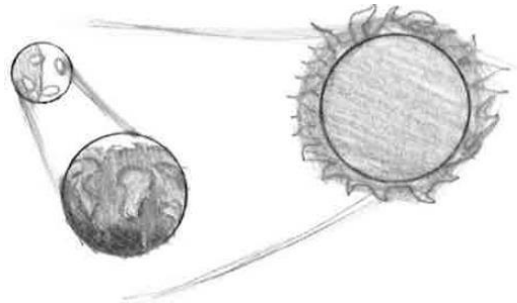


Esquema que representa a origem da Lua segundo a teoria 4



A Teoria que defendere
A única argumentação contra a
Terra. Porém, é possível que a
estado líquido, tenha se estabilizado
lar. Isso explicaria o início
do planeta e da lua no m
é feita apenas de
defenderia a teoria d
teriais muito diferentes (caso viessem de
iferente como defende a teoria da
é capaz de que as partes que
do corpo celeste que colidiu com
enham se misturado com a lua,
da Terra, mas não muito.

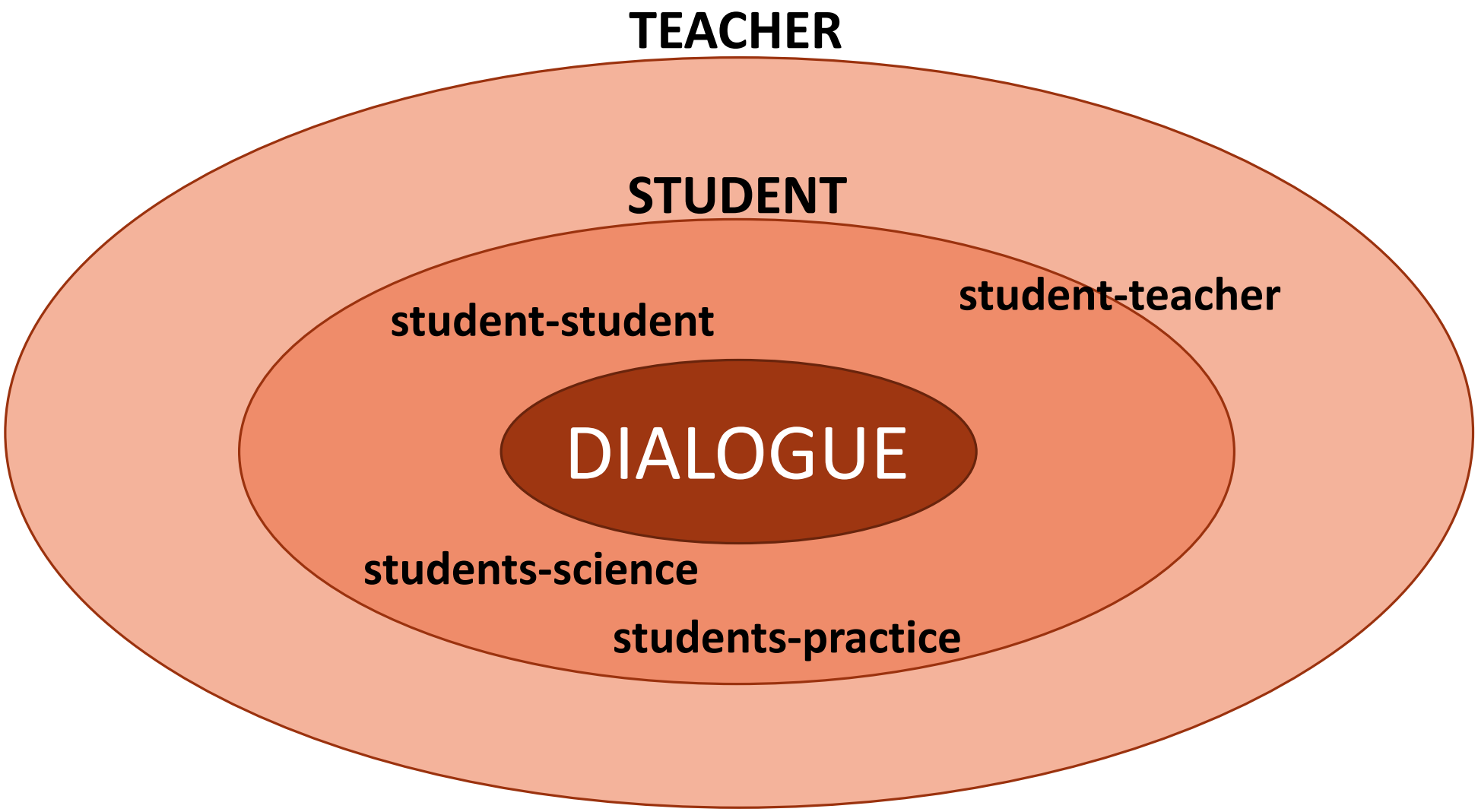




Summary

2. PhD project: the case of classroom dialogue

Supervisor: Christine Howe (Cambridge)


TEACHER
STUDENT
student-student
student-teacher
DIALOGUE
students-science
students-practice

Dialogic teaching-learning

"Soft" position - dialogue is a medium for education

- classroom dialogue contribute to children's intellectual development and their educational attainment;
- opportunities to students to make **independent sense** of what they are learning;
- focus on **thinking process** and **engagement**;

Group work Dialogic enquiry Reciprocal teaching

Exploratory talk Accountable talk

Guide co-construction of knowledge Intermediate theory (TPD)

Dialogic teaching-learning

Goal One Help Individual Students Share, Expand and Clarify Their Own Thinking

☐ **2. Say More:**

"Can you say more about that?"
"What do you mean by that?"
"Can you give an example?"

Goal Three Help Students Deepen Their Reasoning

☐ **5. Asking for Evidence or Reasoning**

"Why do you think that?"
"What's your evidence?"
"How did you arrive at that conclusion?"

Goal Four Help Students Think With Others

☐ **7. Agree/Disagree and Why?**

"Do you agree/disagree? (And why?)"

☐ **8. Add On:**

"Who can add onto the idea that Jamal is building?"
"Can anyone take that suggestion and push it a little further?"

Dialogue is transformative

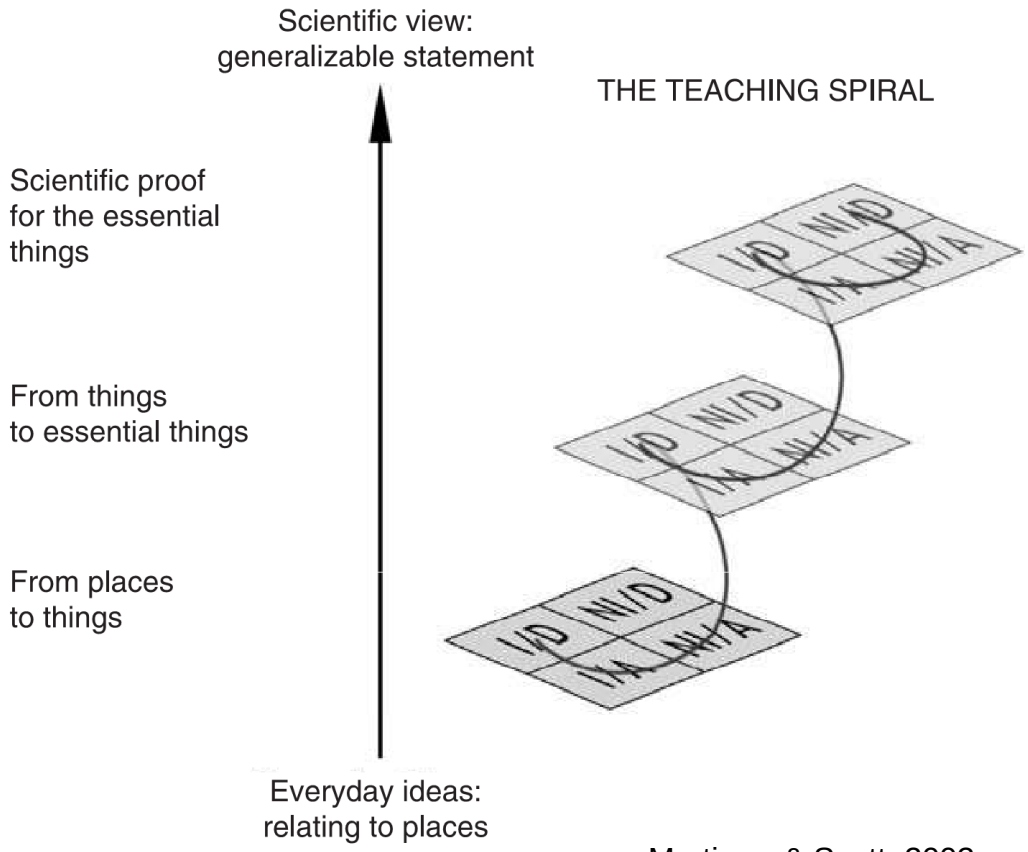
Recitation	Collaborative reasoning
T: I want to know who's the main character in this story. Ss: [Raise hand] **T:** Shelby. S: The goose, Amy's goose. **T:** Ok, Amy's goose. And, one more, Brianna? [writes on blackboard] B: Amy. **T:** OK, Amy. [Writes on blackboard]. What is the characteristics that you, think, or [student raises hand] qualities, that you think that Amy has, and tell me why you think [two students raise hand] she has those qualities ... OK? Kobe? K: She cares about the environment because she's taking care of the goose. **T:** OK, so she's caring. [Writes on blackboard]. Good. Another one, Anthony. A: She doesn't try to kill the fox 'cause it, uh, tried to kill the	**T:** OK. The big question for today is: Should Amy keep the goose? You may start. J: Um, I think Amy should keep the goose, 'cause the goose has to be with her, or else it will be dead again. M: I think Amy should let out the goose, because it um... deserve, it deserves to be free. And um // J: // Yeah, but it might |1| get bit by – It might die, because the fox might eat it |1| A: |1| [to Jeff about Mike] Let him finish... You have to let him finish. |1| M: Yeah but that's a um – but that's just part of nature. Everything dies. People go outside and squish bugs. And the fox comes out and eats a goose. A: I agree with that and I don't think she should keep the goose because I think a goose should be able to be free, fly around, go to lakes. Um, find its own food. And if it dies, it dies. It's just the way of life. J: I agree with Amber.

My (soft dialogic) understanding…

Evidence-based research: discussing/exchanging **different/compelling** opinions is what matters.

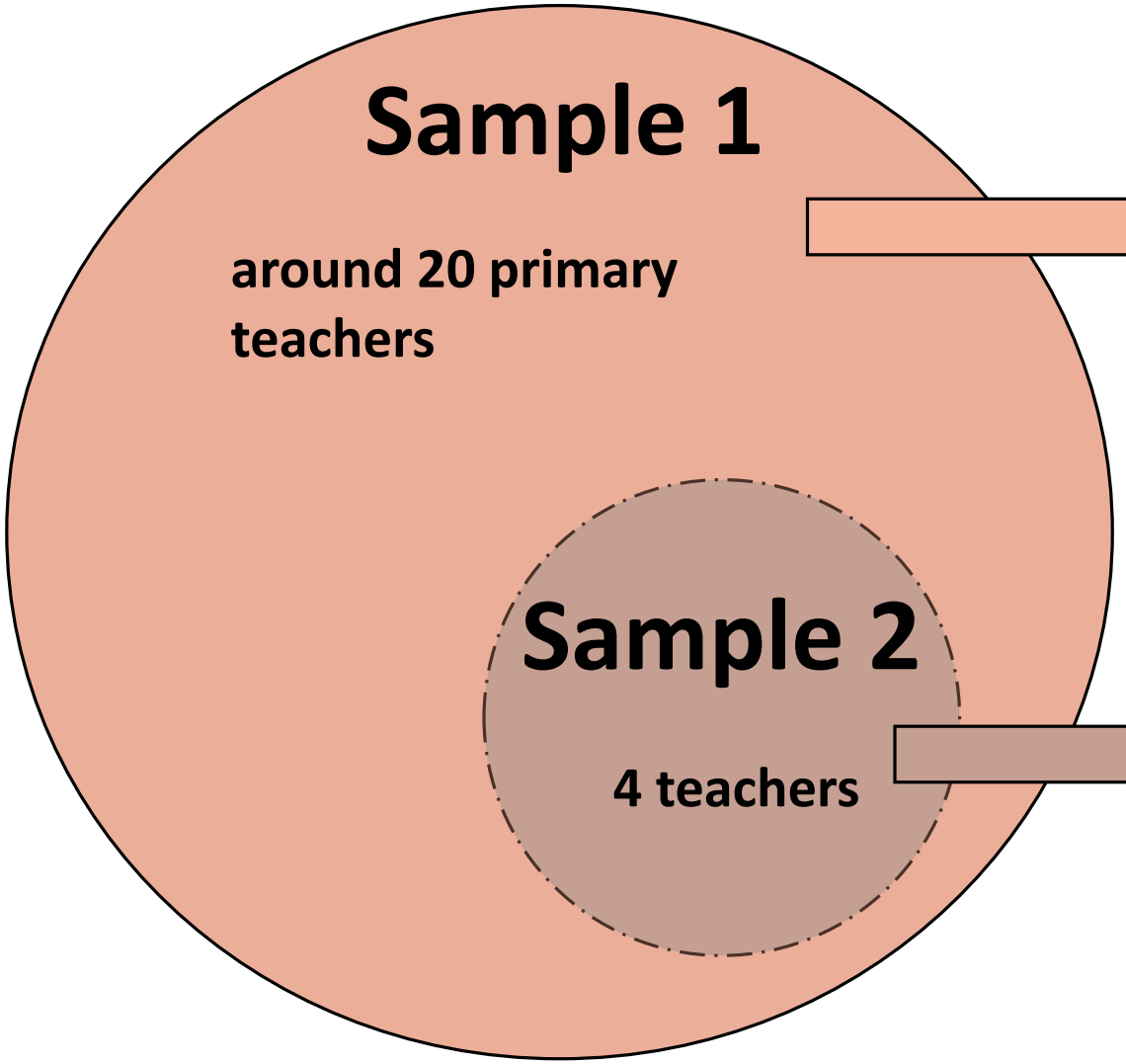
horizontal exchanges – the difference is given by other students

vertical exchanges – the difference is given by the teacher/science



Mortimer & Scott, 2003

Intervention in 2 levels: teaching-learning



2-day workshop

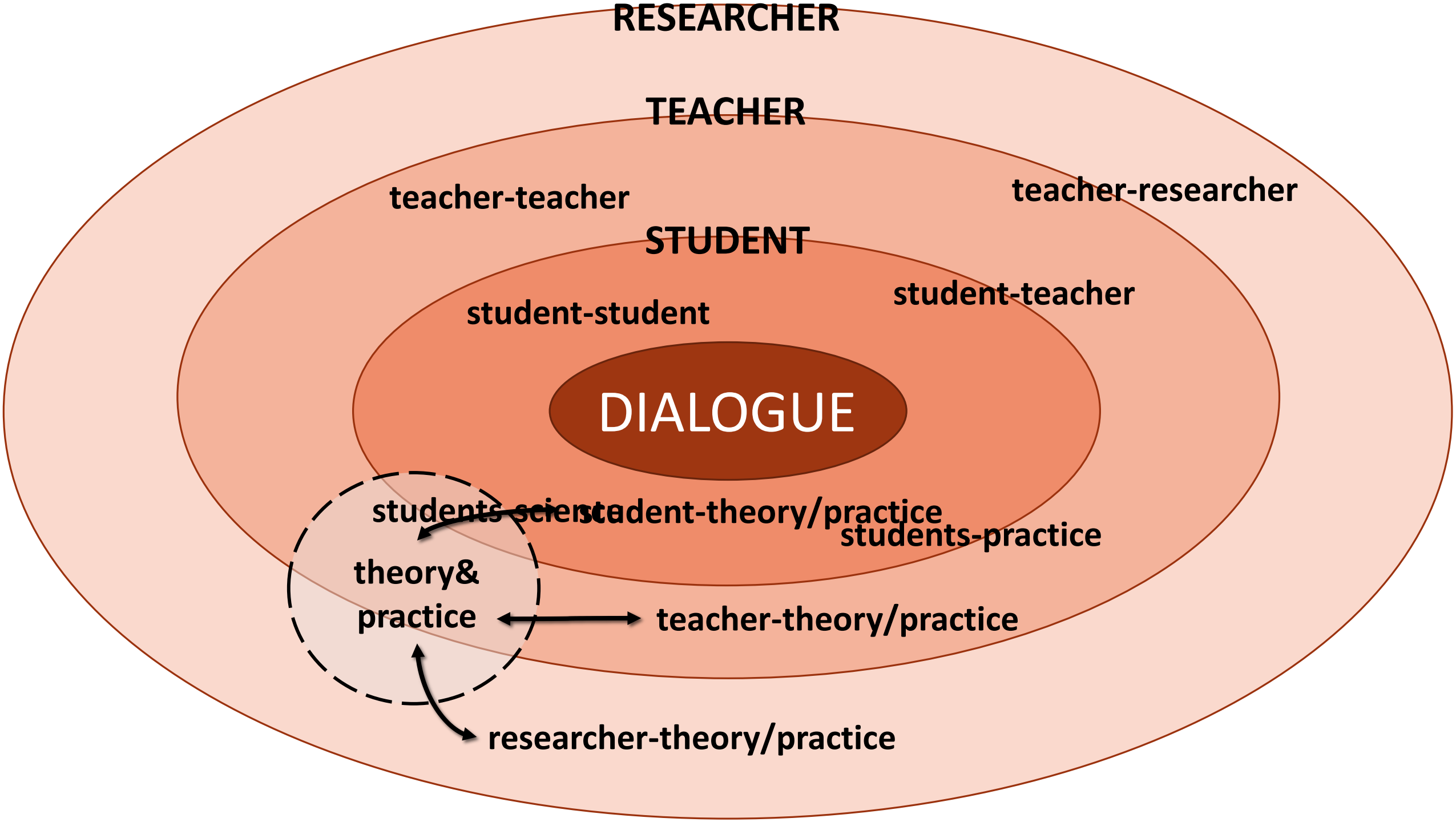
- present and discuss the dialogic approach;
- provide (two) lessons for implementation.

Data collection
20 observations (prior workshop)
20 observations (after workshop)
20 questionnaires
5 interviews

8 to 10 meetings (weekly basis)

- **video-stimulating reflective dialogue**;
- discuss real context;
- design own lessons.

Data collection
32 observations
32 talk analylsis
4 questionnaires
4 interviews
Students outcomes


RESEARCHER
TEACHER
teacher-teacher
teacher-researcher
STUDENT
student-student
student-teacher
DIALOGUE
students-science
student-theory/practice
students-practice
theory&
practice
teacher-theory/practice
researcher-theory/practice

Research questions: first set (teaching)

RQ1) To what extent the **conceptualisation** of a new practice leads to its **realisation**?

1.1) What are the **teachers' conceptions** regarding the **use of dialogue in teaching**?

1.2) To what extent do **teacher's practices change towards more dialogic teaching**?

1.3) What are the **affordances** and **constraints** for the **implementation of a dialogic approach** in teaching?

1.4) What **kinds of lessons the teachers develop and deliver** based on the new approach?

Research questions: second set (learning)

RQ2) What are the relationships among **science learning**, **the use of dialogue** and **teacher intervention**? How do these **evolve** over time?

2.1) How do students build the **scientific concepts** across the lessons?

2.2) How does the **quality of students' talk** change across the lessons?

2.3) How are the **teachers' interventions (dialogue moves)** employed both on group work and whole class settings?

2.4) What is the impact on the **learning outcomes?**

Summary

3. Strong dialogic position: concept-activity-dialogue

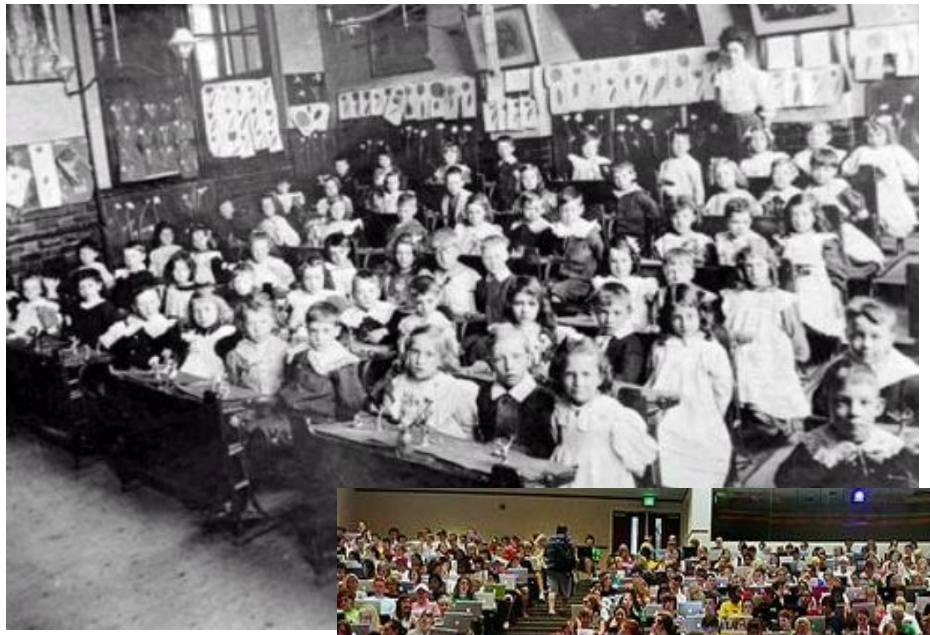
"uneasy relationship between dialogue and activity"
(Matusov, 2009, p. 7)

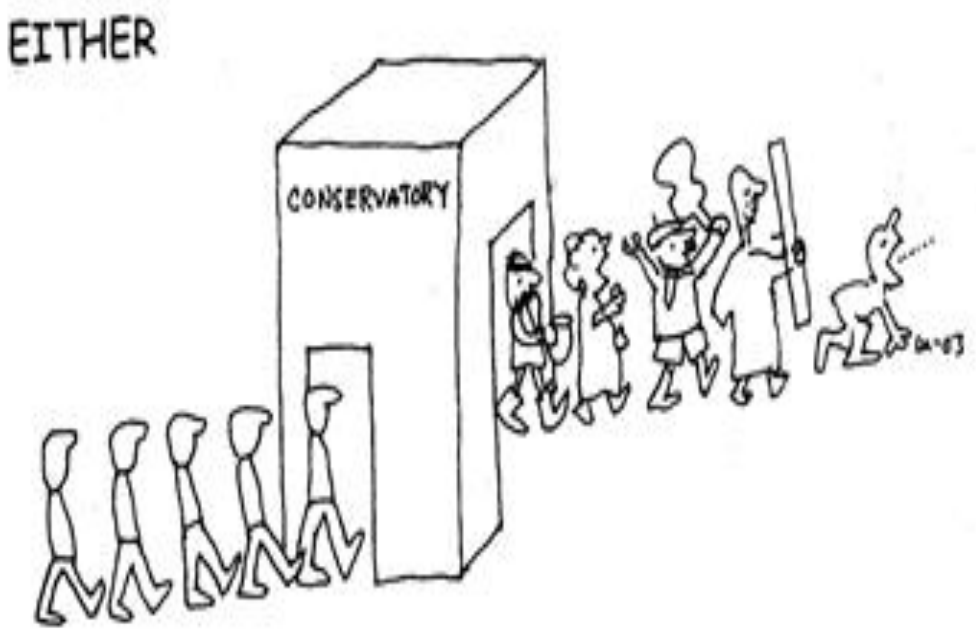
Dialogic teaching-learning (Matusov, Wegerif)

“Strong” postion - dialogue is education and an end in itself

- dialogism, “the other” for human existence;
- meaning-making process occurs between at least two distinct consciousnesses because of the gap of understanding.
- meaning is inherently dialogic and implies an opening of difference;

Dialogue is transformative





Lassi Rajamaa

Many thanks!!

Questions? Suggestions? Comments?

I would love to discuss any point of this endevour with you.

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