Teacher-student interactions in science classrooms: Concept of communicative approach (1)

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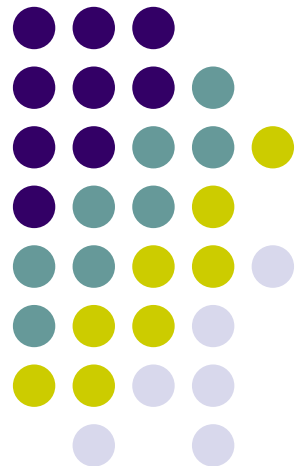


A research project

To develop a way of analysing teacher-pupil interactions in science classrooms focussing on classroom talk.

To explore implications of this analysis for planning and implementing teaching

‘Meaning making in Secondary Science Classrooms’

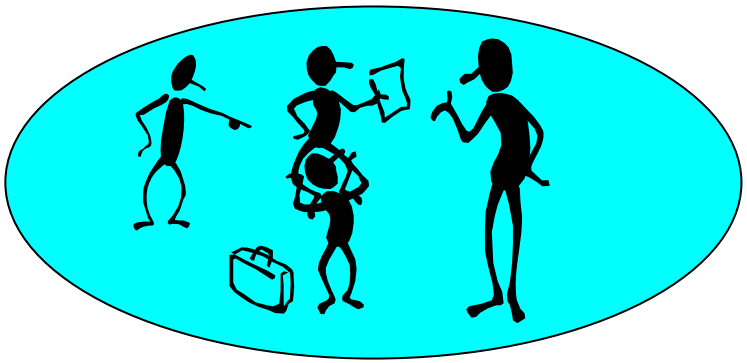
Eduardo Mortimer and Phil Scott

Open University Press, 2003

Vygotsky and learning…in general

Social

plane



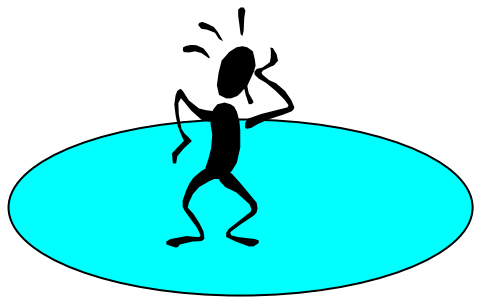
Internalisation

with

restructuring

Personal

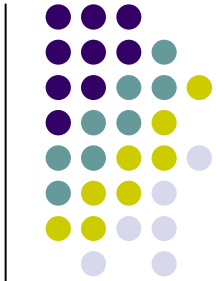
plane



Language and other means of communication

Language as a tool for thinking

Approach to developing framework



Aspects of theory:

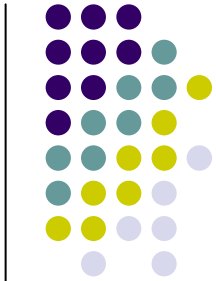
- Authoritative-dialogic: Wertsch, Lotman, Bakhtin
- Forms of pedagogical intervention: Edwards and Mercer, Lemke, Ogborn et al.
- Content of discourse: Vygotsky (everyday and scientific views); Bakhtin (social languages and speech genres).
- Patterns of discourse: Mehan (I-R-E)

Lotman/Bakhtin: Authoritative and dialogic functions of talk

In **authoritative** communication the teacher's interventions are intended to convey information, the emphasis is on the transmissive function of teacher talk,

In **dialogic** communication the teacher encourages students to put forward their ideas, to explore and to debate points of view.

Approach to developing framework



Apply:

- to analysing case study data of science lesson sequences.

Derived framework of analytical tools:

- Communicative approach
- Patterns of discourse: Triads: I-R-E and Chains: I-R-P-R-P-R-
- …and their interaction.

The analytical framework

	Aspect of analysis	
Focus	**1. Teaching purposes**	**2. Content**
Approach	**3. Communicative approach**	
Action	**4. Patterns of discourse**	**5. Teacher interventions**

Transcript 1

WORK WITH A PARTNER

- Read through the transcript
- Look at what the teacher says: how would you describe their role?
- Look at what the students say: how would you describe their role?

Let’s just ignore the sparks (1)

Teacher: Do you remember the electric bell?

Students: Yes! [*in chorus*]

Teacher: OK! Did any of you notice, did any of you actually hold onto the bell after it had...been working? What did you notice?

Suzanne: Vibration

Teacher: Well, the arm vibrated, yes. Sound. What else did you notice?

Tom: It was loud.

Teacher: That's not quite what I'm getting at.

Let’s just ignore the sparks (2)

Teacher: Remember the bell. There's the bell [*holding up a bell in front of the class*]. You did the experiment. If you held onto this bit here where the wires were [*indicating*], did you notice anything there?

Jason: There were sparks there.

Teacher: Heat, did you notice some heat?

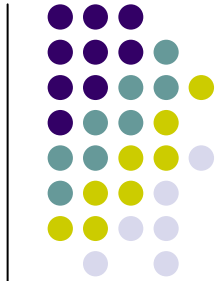
Jason: There were sparks from there.

Teacher: There were?

Jason: Sparks.

Teacher: There were some sparks, yes. Let's just ignore the sparks a minute...some heat. There was a little bit of heat there with that one.

Pattern of discourse

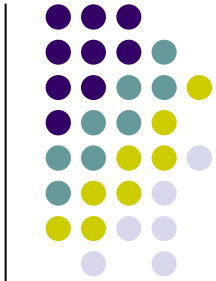


Teacher: Do you remember the electric bell? [INITIATION]
Students: Yes! [RESPONSE]
Teacher: OK! [EVALUATION]

Teacher: Did any of you actually hold onto the bell after it had...been working? What did you notice? [INITIATION]
Suzanne: Vibration [RESPONSE]
Teacher: Well, the arm vibrated, yes. Sound. [EVALUATION]

Teacher: What else did you notice? [INITIATION]
Tom: It was loud. [RESPONSE]
Teacher: That's not quite what I'm getting at [EVALUATION]

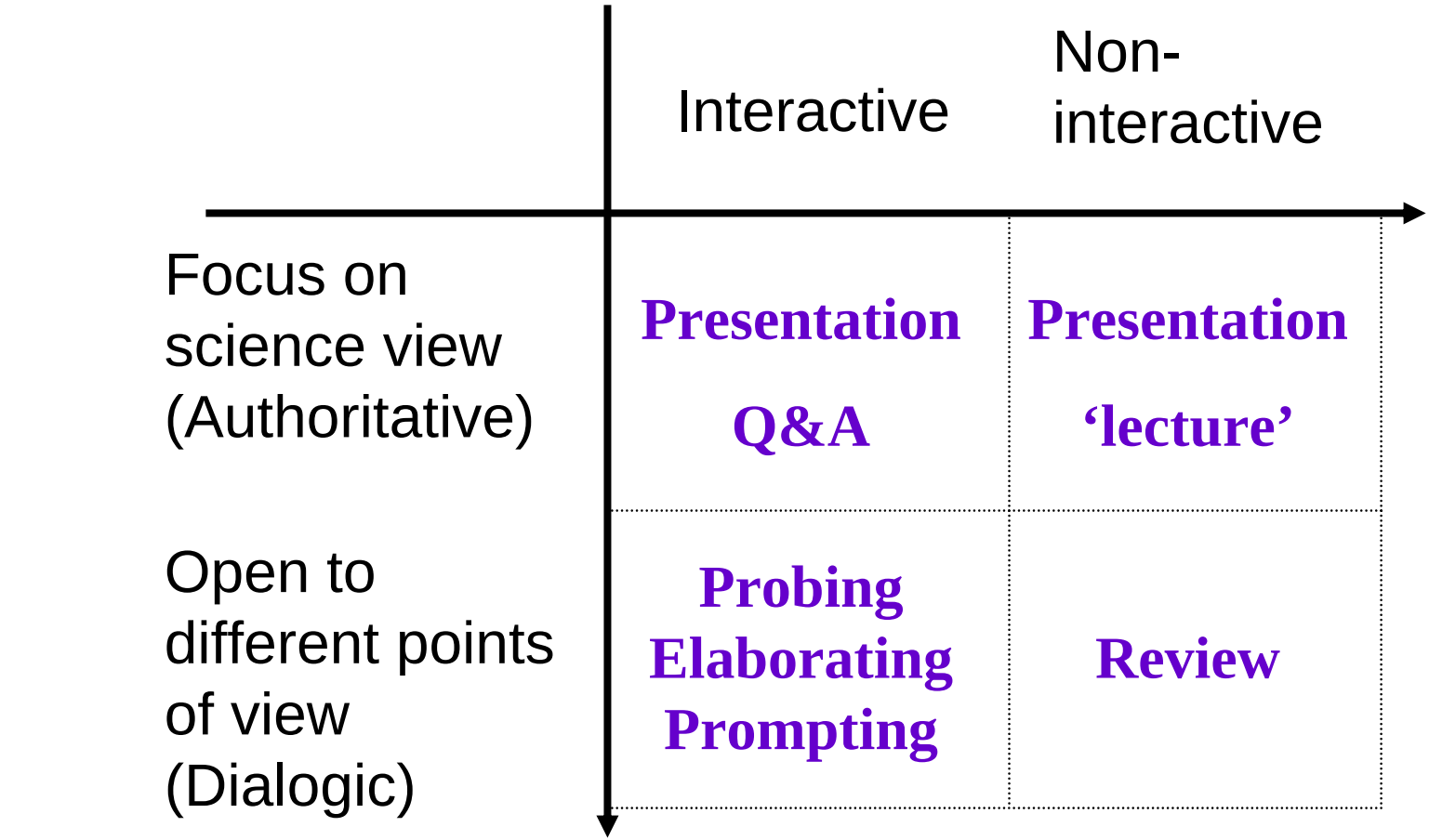
Let’s just ignore the sparks



- Teaching purpose
  - developing the scientific story
- Communicative approach
  - Interactive/authoritative
- Pattern of discourse
  - I-R-E

  (Triad: Initiation-response-evaluation)

Communicative approach

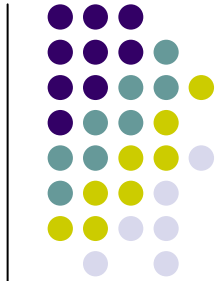


Transcript 2: Rusty Nail

WORK WITH A PARTNER

- Read through the transcript
- Look at what the teacher says: how would you describe their role?
- Look at what the students say: how would you describe their role?
- How is this different from the first transcript?

Rusty Nail

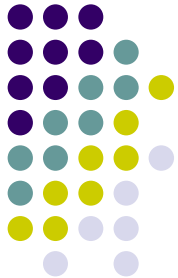


1. **Teacher:** So - what do you think it was - thinking about the places - that made your nail go rusty?
2. **Fiona:** Condensation might.
3. **Teacher:** Condensation - right [*writes it on board*]. Dawn?
4. **Dawn:** Could it be like - climate like - if it's hot or cold?
5. **Teacher:** Hot or cold. Do some other people think that hot or cold might be something significant, in making something go rusty? Hot or cold - is that an idea - yeah? Hot. Which? Both of them, or just one?
6. **Dawn:** Both
7. **Teacher:** Haley's saying perhaps cold.

Rusty Nail

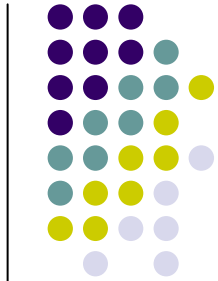
8. **Teacher:** Right [*adds 'cold' to list on board*], have we got anything else it could have been? Anyone that hasn't given me an answer yet? No? Andrew then.
9. **Andrew:** On me bike - if I scrape me bike and leave it out in the rain, it goes rusty.
10. **Teacher:** So - what are you saying is making it go rusty then? Which of these things, which is causing it to go...
11. **Andrew:** Rain
12. **Teacher:** Well, somebody else is suggesting it's the rain rather than the scratch...
13. **James:** Erm – it's when it's raining it's not that one which – it's when it's dry it goes rusty. When it's raining don't do much – when it's dry it goes rusty.
14. **Teacher:** Right, so does it need – are you saying it needs the rain?
15. **James:** It's got to rain and then it's got to dry to go rusty.

Pattern of discourse



1. **Teacher:** So - what do you think it was - thinking about the places - that made your nail go rusty? **INITIATION**
2. **Fiona:** Condensation might. **RESPONSE**
3. **Teacher:** Condensation - right [*writes it on board*]. Dawn? **PROMPT**
4. **Dawn:** Could it be like - climate like - if it's hot or cold? **RESPONSE**
5. **Teacher:** Hot or cold. Do some other people think that hot or cold might be something significant, in making something go rusty? Hot or cold - is that an idea - yeah? Hot. Which? Both of them, or just one? **PROMPT**
6. **Dawn:** Both **RESPONSE**
7. **Teacher:** Haley's saying perhaps cold. **PROMPT**

Rusty Nail



- Teaching purpose
  - Exploring students' views
- Communicative approach
  - Interactive/dialogic
- Pattern of discourse
  - I-R-P-R-P-

  (Chain: initiation-response-prompt-response-prompt)

1. What have we got in common?

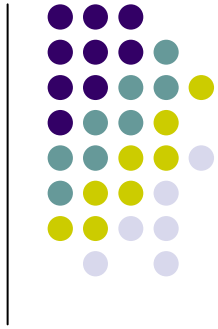
RAIN, DAMP, MOISTURE, WET, SALT, VINEGAR, AIR, CONDENSATION, COLD, DARK

1. **Teacher:** Now - what I'd like you to do first of all is to look at these suggestions - is there anything that some of them actually have in common - Kevin, first of all then...
2. **Kevin:** Erm - rain, damp...then cold.
3. **Teacher:** Rain, damp.

4. **Teacher:** ...what have we got in common perhaps with all the things we've underlined. What is it Kevin?
5. **Kevin:** They're all wet.

6. **Teacher:** Well - they're all wet - so what do we mean by wet then? Is there something else about wet?
7. **Students:** No - wet [*other mutters*]

2. What have we got in common?



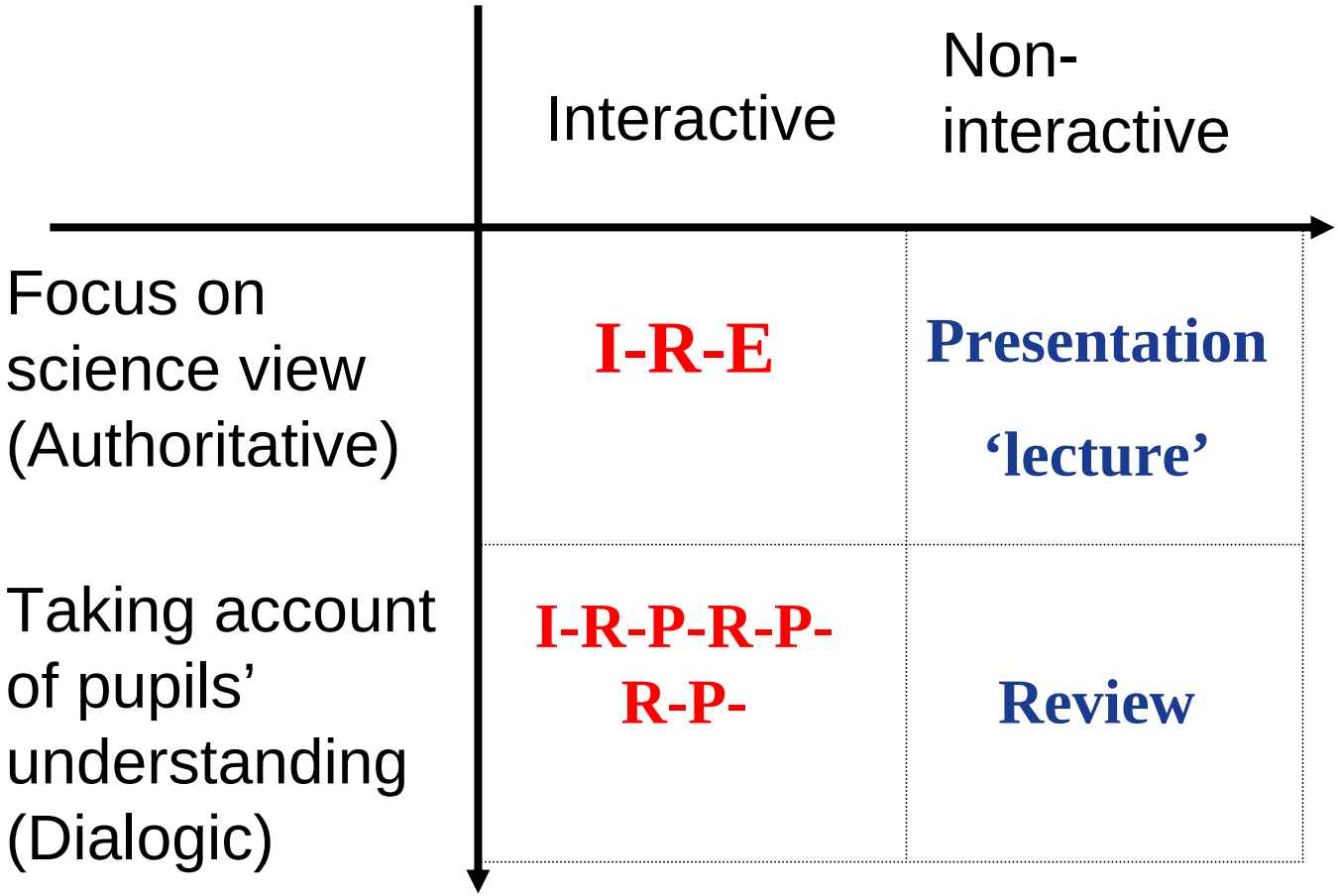
8. **Teacher:** What is wet perhaps?
9. **Student:** [*chorus*] Water!! [*laughter*]

10. **Teacher:** Water! So is that the key thing? Ketan what do you think? Is water the key thing here that's linking all of these...
11. **Ketan:** Yes.
12. **Teacher:** You've said rain, damp, moisture, wet, oh...condensation and what I'm asking you is 'what do you mean by that?' So what is the common link perhaps?
13. **Ketan:** S'all different forms of water.

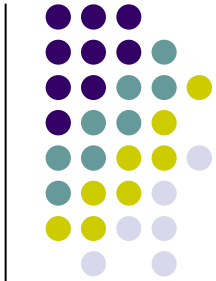
What have we got in common?

- Teaching purpose
  - developing the scientific story
- Communicative approach
  - Interactive/authoritative
- Pattern of discourse
  - I-R-E
- Form of teacher intervention
  - confirmatory exchange

Patterns of discourse



Key features of authoritative and dialogic discourse



	Authoritative discourse	Dialogic discourse
Basic definition	focusing on a single perspective, normally the school science view.	open to different points of view
Typical features	- direction prescribed in advance - clear content boundaries - no inter-animation of ideas - more than one point of view may be represented but only one is focused on	-direction changes as ideas are introduced and explored -no content boundaries -variable (low-high) inter-animation of ideas -more than one point of view is represented and considered

	Authoritative discourse	Dialogic discourse
Teacher's role	- authority of teacher is clear - teacher prescribes direction of discourse - teacher acts as a gatekeeper to points of view	- teacher assumes a neutral position, avoiding evaluative comments - greater symmetry in teacher-student interactions
Demands on students	- follow directions and cues from the teacher - perform the school science language following the teacher's lead - accept the school science point of view	- present personal points of view - listen to others (students and teacher) - make sense of others' ideas - build on and apply new ideas through talking with others

So which

COMMUNICATIVE

APPROACH??

is the

BEST

…depends on the purpose

- **Purpose:** to introduce a science concept
- **Communicative App:** Interact/authoritative
- **Pattern discourse:** triads/I-R-E

- **Purpose:** to explore pupils' everyday views
- **Communicative App:** Interactive/dialogic
- **Pattern discourse:** open chains of interaction

Teaching intervention 1: The BIG circuit

VIDEO CLIP