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Influence Of The Situation On Learning: The Progress Of Reaction.

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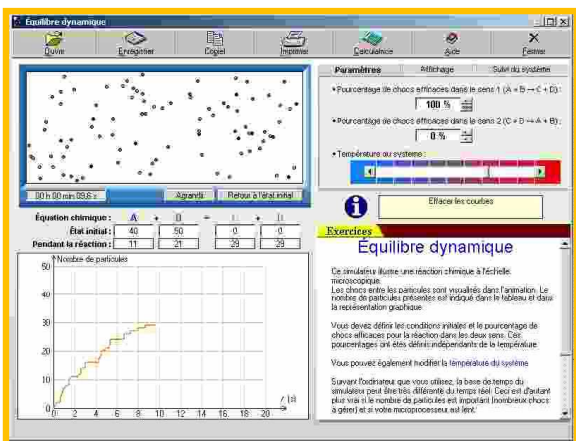
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Influence Of The Situation On Learning: The Progress Of Reaction

Introduction

Teaching and learning of chemistry has long been studied and a large share of the research on this topic has used chemical reactions as a context. Many points of view have been studied like teaching the notion of chemical reaction (Gabel, 1998), and specifically student conceptions (Driver & al., 1985) or their difficulties in understanding this notion (Stavridou & Solomonidou, 2000). But, understanding chemical reaction is difficult because it involves the notion of substance under transformation.

Aims and objectives



Teaching sequence involving an ICT with a microscopic aspect (Le Maréchal et al, 2009)

Compare knowledge embedded into the student's activity and knowledge that the teacher structures when s/he comes back to review student work in the postlab session that we called Debriefing (Khanfour-Armalé & Le Maréchal, 2009).

Data

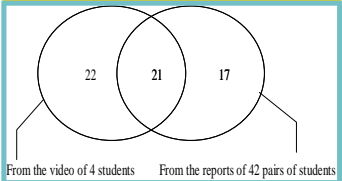
- Two teachers, **MC and HB**, used this task for two years with their classes
- 42 reports** corresponding to 84 students were analysed,
- Four pairs** of MC's students were video taped.
- The students were very autonomous. MC and HB were video taped during their debriefing.

Methodology

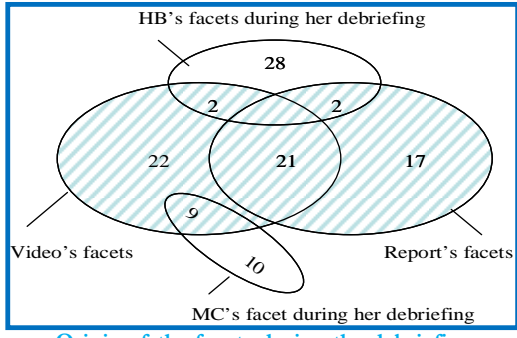
The students and teachers' videos were extensively transcribed and analysed from the facet point of view.

Facets analysis

Facets method is a tool that can allow us to compare the knowledge from different origins, involved during a task done either by two people (Minstrell, 1992).



Origin of the 60 facets of the reference list



Origin of the facets during the debriefings

Concepts analysis

	Collision	Particle	Number of particles	Initial state	Final state	Progress of the reaction	Amount of substance	Chemical transformation	Substance	Chemical element
MC	15	22	7	7	4	15	22	4	4	0
HB	4	2	2	8	14	14	7	27	16	6
	Specific to the simulation level			For both levels			Specific to the chemical reaction at the macroscopic level			
MC	44%			48%			8%			
HB	8%			43%			49%			

Percentage of occurrence of the concepts connected to the progress of reaction during MC's and HB's debriefing.

Facet is a decomposition of knowledge into small units
Minor reconstruction : decontextualise the students' words and transform them into a facet that must contain a more global idea

If students talk about simulated particles that change colours when they collide.
They may say: "the pink one becomes orange and the blue one becomes green".
The corresponding facet will be:
Particles change their colours and Particles touch each other or collide.

Example of the reconstruction of Facets of knowledge

Results

The continuity (the number of facets that the student work and the debriefing have in common) was found to be different according to the teacher. MC's and HB's debriefings did not involve the same kind of knowledge. MC used the notion of the progress of the reaction at the same microscopic level (44%) as during the student work with the simulator. HB used the same concept of the progress of the reaction but at a macroscopic level (49%).

Conclusion

New information was added to the definition of the debriefing and the notion of the limit of the debriefing was introduced.
The limit of the debriefing, when teacher use the focal concepts at the same level as during the student work. Beyond this limit, the teacher is no longer debriefing, s/he is continuing the teaching sequence.

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