Video-experiments, a possible apprenticeship of awareness

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Introduction

Researchers [1] have found that only 25% of the 16-years old students achieve the stage of formal operations that is required for a conceptual thinking and problem solving, and that "Scientific thinking may not be accessible before about the age of 16" [2]. This entails that since this age (third grade in secondary school) we might reasonably and cautiously begin to construct systems of scientific concepts – provided that we remember that motivation is necessary and awareness of conceptual meanings yet needs to be facilitated-actualized in most students.

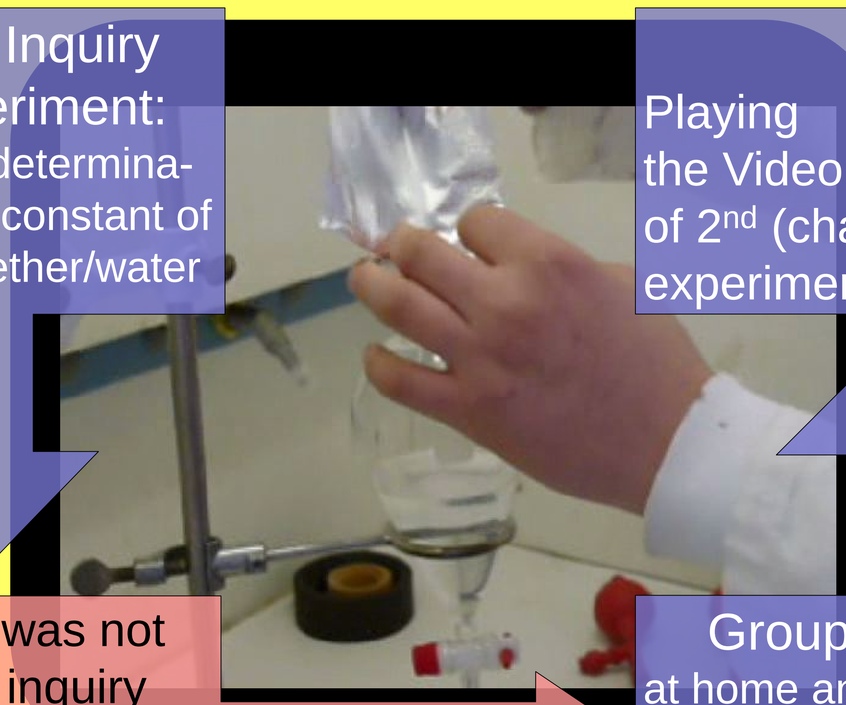
The shift towards high order cognitive operations, as shaping general cognitive & affective apprenticeship (learning how to learn & *feeling* capable to understand and learn) can start from a purposefully created narrative context, from which *a transition to conscious, propositional language* can be obtained in several ways [3].
This experiment deals with one of these *scaffolded transitions* [4] that was operated by means of video experiments and video interviews.

Experimental path

MAIN ACTION-RESEARCH PATH

1st Guided Inquiry group experiment:
Planning and determination of partition constant of Adipic Acid in ether/water

Jan 11st



Experiment was not lived as an inquiry experience and yielded procedural understanding only

Outcomes

Playing the Video of 2nd (changed) experiment

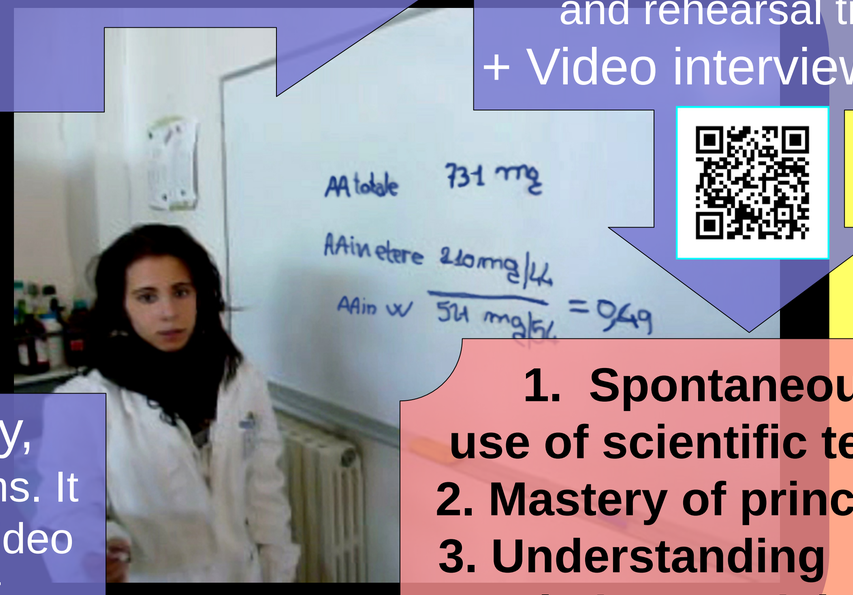
Group screenplay,
at home and class teams. It was aimed to make a video of the same experiment, deciding important changes.

Jan 18th

Feb 6th

Group preparation to play an interview
(written revision of answers and rehearsal trials)
+ Video interview play

Feb 9th-22nd



1. Spontaneous use of scientific terms.
2. Mastery of principles,
3. Understanding calculations and laboratory strategies

From the tenth Johnstone's "commendment" [5]:

10. There should be opportunity given to teach (you don't really learn until you teach)

References

[1] Gräber W., Stork H. (1984) cited in: *Essentials of Chemical Education*, H.Barke, G.Harsh, S.Schmid, Springer Berlin 2012p. 58

[2] F. Al-Ahmadi, N. Reid, (2012). *Journal of Science Education*, 13(1), 18-24

[3] Tifi, A. (2012). *Awareness from the Beginning*, 5thConference on Concept Mapping, Valletta, (Mt)
cmc.ihmc.us/cmc2012papers/cmc2012-p86.pdf

[4] L. S. Vygotsky, (1986). *Thought and Language*. Baskerville, Massachusetts: MIT Press

[5] Johnstone, A.H. (1997). Chemistry: Teaching-Science or Alchemy? *Journal of Chemical Education, 74*(3), 262-268

Conclusion

The proposed method of approaching awareness by guided revision and rehearsal of propositional-student-made audio-video-texts, in the perspective of making sense to others, was markedly better – in motivating and learning terms – than other different strategies that were tried with the same student group. "Minds-on" adaptations will be tried in the incoming academic year, accompanied by a reduction of the initial-formal teaching phase.

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