

THE SELF-CRITICAL REFLECTION ON EXPERIMENTAL WORK

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Mistakes by pupils and teachers/researchers are often treated as crime in the case of pupils and not even recognised in the case of teachers/researchers. In this research we attempt to show that 'everyone can learn by their mistakes'. If the teacher/researcher undertakes self-reflection critically of the work they have done with students then this will show where mistakes occur, which might hamper the student's thinking.

Research

We will present examples of self-critical reflections of our own experimental work. The theoretical framework for this study is based on the constructivist view of teaching. Analysing our experiments we have found that the researchers have made various types of mistakes:

1. The researcher does not react to the indirect information given by a student.
 2. The researcher is not sensitive on the ambiguity in the interpretation of some statements.
 3. The researcher is not sensitive enough for the important moments.
 4. The researcher is engaged by his/her own idea and cannot follow the pupil's way.
- We have tried to determine what is fundamental about different mistake. Our incomplete classification of mistakes describes phenomena which show that mistakes do not depend on the types of problems given nor on the level of pupils' development.

We have concentrated on the different ways of interactive mathematical and social communication: questions, sentences, and non-verbal expressions. We have also observed the social aspect of pedagogical interaction. Following this we have tried to evaluate our interpretations and reactions in the directions of the sensitivities on special "sense" and meaning that emerged during the discourse and on our skills in understanding correctly the speakers' intentions.

Every researcher has his/her own mental model of a concept or of a solving process and this model is autonomous for each researcher. Sometimes it is impossible to foresee what kind of obstacles and restrictions this individual model brings into the observed situation. The examples of mistakes presented will show that the researcher occupied by his/her model is not sufficiently sensitive to perceive the student's model and hence causes communication difficulties between researcher and student.

We will show that the interaction between the researcher and the student could be detrimental to the student's thinking process. In the theoretical model of research it is the researcher's role to be objective during his/her work, to create confidence and accept fully everything that a student says and does during the experiment. But reality shows that it is not easy to work according to this rule. The self-critical reflections on experimental work can help avoid the same mistakes in future work. In addition this reflection increases the sensitivities of researchers and develops a wider perspective when analysing research results.

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