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Main Difficulties in Teaching Chemistry in Secondary Schools

TEACHERS' CASE STUDY

Teacher's Case Study No 7

Subjects: Chemistry, Physical Education
School: Gymnasium Nordenham
Place: Lower Saxony, Germany

Description of the Case Study

1. What do you think are the reasons for major difficulties in learning chemistry at school?
   Chemistry teaching starts with class 6, age 12. Usually, the pupils are quite interested at that age, but with class 9, age 15, their interest in chemistry is going down. Chemistry is not an easy subject, experiments are usually fun – 30% of the learning is done via experiments – but formulas discourage some pupils, and if the foundations of chemistry are not learned in time, chemistry becomes harder and harder in later years.
2. What major difficulties do you have in teaching chemistry?
   The major problem is lack of time. For example, you have only 2 teaching units (called hours, but they last 45 minutes) in chemistry per week in class 9. Especially if you want to do experimental work, this is simply too short to get such experiments done. And double-units only start up from class 10.
   Another challenge is getting some of the pupils motivated. Some pupils show no interest in chemistry at all, no matter what you do or how you do it.
3. What kind of courses - if any - on didactics of chemistry did you attend?
   There was very little chemistry-specific didactics and methodology at the university. Part of that is compensated in the teacher's training course. However, you would wish for more reference to school and more discussion of school reality at university. Mind you, this is slowly changing.
4. Why do many young people quit learning chemistry and, in general, scientific studies after upper secondary school?
   Part maybe the role model. Chemistry teachers used to have a rather bad reputation, probably due to their scientific approach and lacking teaching skills. However, younger

teachers and trainees get along better with the students, so this is changing. Chemistry matters in real life, pollution or catastrophes do interest the students, and not really in a negative way. I would say, it's rather the subject immanent difficulties, formulas, etc. that put pupils off, not the public view or image of chemistry.

5. How could young people be helped take up scientific studies after upper secondary school?
   There should be more insight and knowledge about professions and jobs that deal with chemistry. We used to do more study visits to the industries in our area, for example to Titan and Preussag, but this has stopped due to time problems.
   There are now more pupils selecting chemistry as an advanced course in school, which is a good sign. Chemistry at university is very difficult without attending such an advanced course before. However, in order to successfully pass such an advanced course, you need the basic motivation and the basic knowledge from the earlier years.
6. Which initiatives has your country undertaken in this direction?
   There are new core curricula that tackle the problems mentioned above. Context-oriented teaching is one of the keywords and things are moving in the school ministry.
7. Have you ever taken part into a research project concerning scientific learning?
   No
8. Could you mention any recent research you have heard of, that might be useful to our project?
   No
9. Could you suggest any other areas of research that might be useful to our project?
   No