

2.37 Clothes – The Second Skin. Cosmetics: Between Hope and Effect – What Do We Put on our Skin?

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Background and scope

Recently the German Federal State of Bremen established a new type of secondary comprehensive school ('*Oberschulen*'). One of the goals of the reform was to implement science as one integrated subject, for students in grades 5-8, where Biology, Chemistry and Physics were formerly three separate science subjects.

Science teaching in this new subject is outlined by the governmental syllabus to be operated by different framing contexts with the intention that these contexts are taught through the integration of sub-topics from the different domains of science. Pedagogies, which follow student-active and problem-based learning, as well as an inquiry-based and societal-oriented science education, were suggested.

According to this educational reform project, different groups of science teachers and science educators under the PROFILES-Bremen project, have been developing new lesson plans which

fit the new syllabus. One aspect of PROFILES-Bremen, in recent months, was a teacher group working on a lesson plan framed in the context of 'Skin and Cosmetics.' The module is intended to promote students' experimental and communication skills. This module also aimed to encourage societal-oriented evaluation and decision-making abilities through analysing media advertising (which included the internet, TV spots and printed media).

Another focus of the development was helping teachers to cope with the high heterogeneity in language abilities and achievement in the Bremen *Oberschule*. Therefore, the lesson plan used different pedagogies for inner differentiation, especially while conducting practical work. One of the approaches was to give alternative experimental tasks with different degree of guidance and demand within different worksheets, according to the abilities of different achieving students.

The lesson plan

The structure of the lesson plan is modularized and consists of three sub-modules. It is possible to use parts of this unit, as well as the whole unit. A modularized structure gives the teacher the option to tailor the materials to the specific circumstances in her or his school. Planning the lesson with different sub-modules also allows teachers from other German Federal States (which follow different syllabi and work under varying conditions) to adopt the materials, or parts of them that they may deem relevant.

The first sub-module "Cosmetics: Between hope and effect – what do we put on our skin?" consists of several components which can be small taught successively, or separately.

They can also be combined individually, depending on the school curriculum, students' prior knowledge and abilities.

The sub-module starts with a collage of different cosmetic products (Figure 1), such as shower



Figure 1. Different advertisements on cosmetics

The focus of the third sub-module is about fibres and their properties in the context of protecting the skin by means of clothes. This part is called: "Cool outfits for every day – which fabrics are the best?" The students conduct several simple laboratory tasks to get to know properties of materials such as thermal isolation, (water) resistance, or structure. Other aspects, e.g. the price or environmental factors can also be taken into account. Also the module considers the difference between natural and artificial fibres. In the end, the students put together outfits for different situations, taking the following into consideration: What fabrics do I prefer when I'm involved in sporting activities? What keeps me warm? Which clothes are the best choice for particularly hot weather? Again, there is a presentation of the results at the very end of the module.

Reflection and outlook

The lesson plan was developed by Participatory Action Research (PAR) as described for science education by Eilks and Ralle (2002). Teachers and science educators are working together and exchanging their experiences and theoretical framework to develop teaching materials, classroom practices and contribute to teachers' continuous professional development (Mamlok-Naaman & Eilks, 2012).

Three professional development providers, one Bachelor-candidate, and six teachers worked on developing the material. Development of the lesson plan took roughly nine months, with meetings every four weeks. In the meetings, the teachers and the team from the university exchanged their ideas, views and worked on the teaching and learning materials.

A special focus of the group work was implementing pedagogies for inner differentiation, too. Teachers provide experiences and information on demands concerning heterogenic classes and their difficulties in the specific case of the Bremen *Oberschule*. Through cooperation of teachers and university educators, different pedagogies were analysed and finally suitable

suggestions were adapted for the topic and the specific requirements. Since the topic was also a new field of content to many of the teachers, experimental workshops were undertaken in the university to raise teachers' knowledge about potential laboratory activities, but also promoting their self-efficacy in implementing the module in their classrooms.

The complete module is now to be tested and implemented in different schools by the PROFILES-Bremen network. The cooperation of teachers with curriculum developers from the university provided a valuable framework for developing feasible teaching materials. Presentations to teachers from other schools provoked great interest in adopting the materials even beyond the PROFILES-Bremen schools. From the next school year, more schools are expected to enter PROFILES-Bremen and will benefit from the developed materials.

References

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