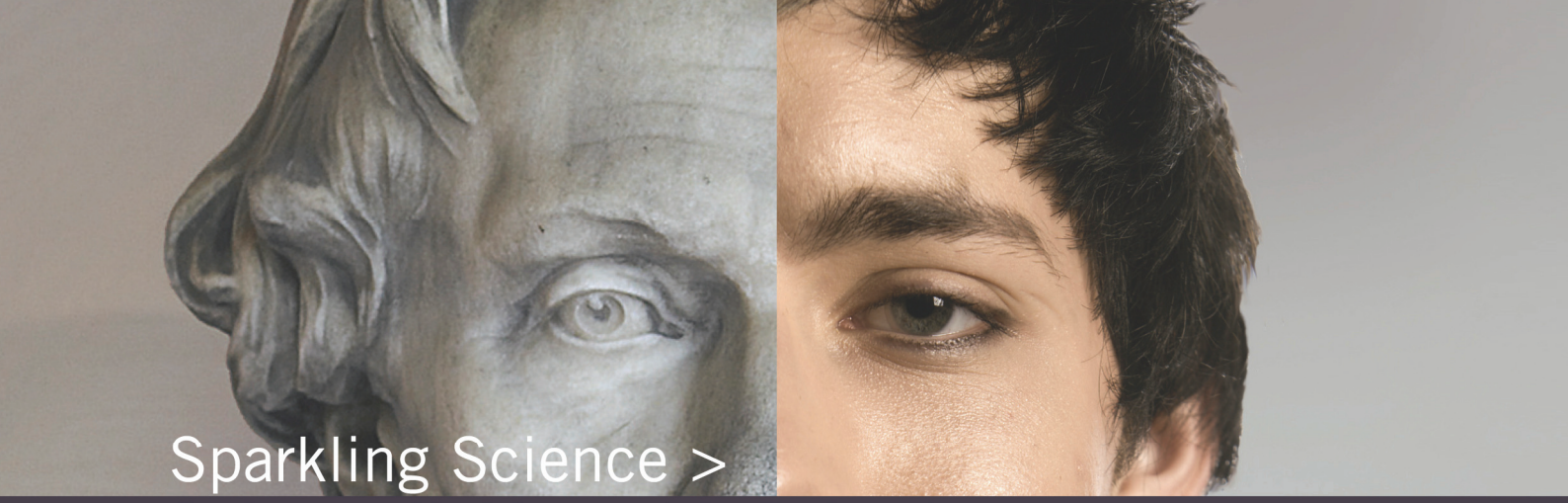

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Interim Report, October 31st 2009

Searching for footprints of climate in classrooms! Highschool students, teachers, and scientists investigate climate conditions in classrooms looking for correlations between heat and students´ concentration abilities

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SCIENTIFIC CO-OPERATION PARTNER
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SCHOOLS INVOLVED
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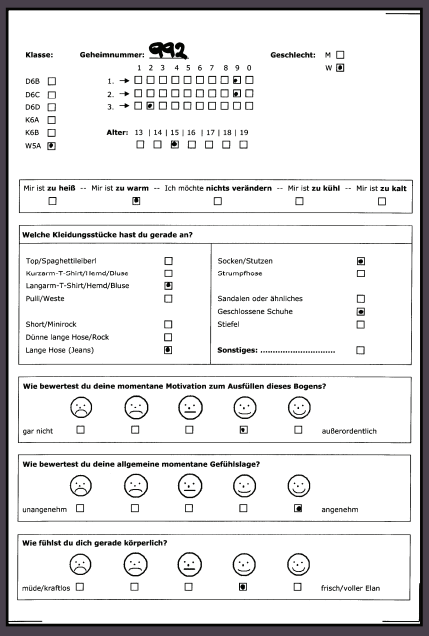
GRg 4/Wiedner Gymnasium/Sir-Karl-Popper-Schule, Vienna
BG Rechte Kremszeile, Krems, Lower Austria



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Searching for footprints of climate in classrooms!

Highschool students, teachers, and scientists investigate climate conditions in classrooms looking for correlations between heat and students´ concentration abilities

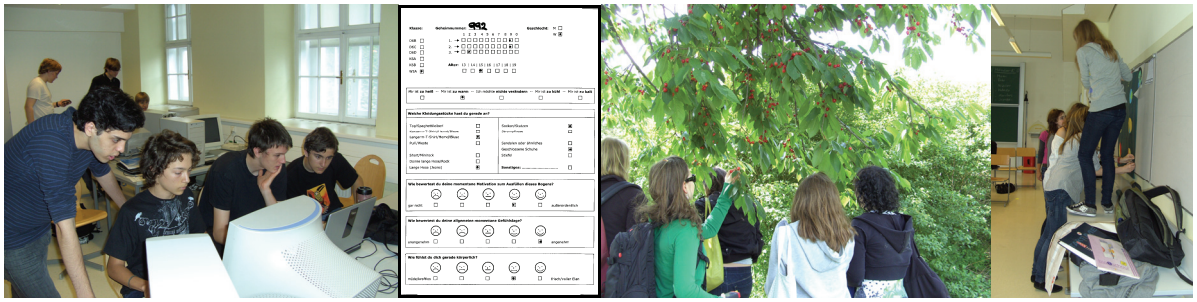
In the summer semester 2009, 120 students from three Austrian schools carried out about 2200 concentration-tests in various classrooms. Furthermore, the students used sensors to collect and document the corresponding indoor climate conditions of 14 rooms while performing the tests. The data may indicate a correlation between classroom climate conditions (such as temperature) and the students' ability to concentrate in the classroom. In order to obtain reliable values, all measurements and tests took place during regular lessons.

One of the scientific challenges of our project is to identify and evaluate in detail different factors that may influence the concentration ability of students during normal lessons in school. In a joint activity, scientists and students developed a questionnaire based on scientific principles and suggestions coming from the students. This questionnaire aims to sum up the state of a student in a classroom in terms of factors such as their thermal conditions, their personal motivation, their emotional circumstances, their well-being as well as the attire worn during the tests. After a thorough instruction unit given by the collaborating scientists, teachers and students were able to perform the tests independently.

Indoor climate conditions were gathered by measuring air temperature and relative humidity in 5-minute-intervals. During a certain period of time, in one room of each school, air quality was additionally evaluated by measuring the concentrations of CO_2 and particulate matter.

Scientists, students, and teachers periodically held meetings, participated in workshops and regularly communicated by e-mails and by phone. To enhance the cooperation between the three Austrian schools, a day-trip to the city of Krems was organized. Beyond the social issues, the performed activities included: 1) a technical and scientific unit (a visit to the light-laboratory of the university of Krems supported by an expert's presentation, a visit to the weather-station of the Central Institute of Meteorology and Geophysics and the air quality monitoring site of Lower Austria) and 2) hands-on activity collecting meteorological data in the wine-growing region of Lower Austria.

The first phase of the project (measurement-phase) has already been completed. The second phase has started in September 2009 and is going on during the winter semester 2009/10. Currently, loads of data are being analysed and interpreted. Inasmuch as possible students have been, are, and will be actively



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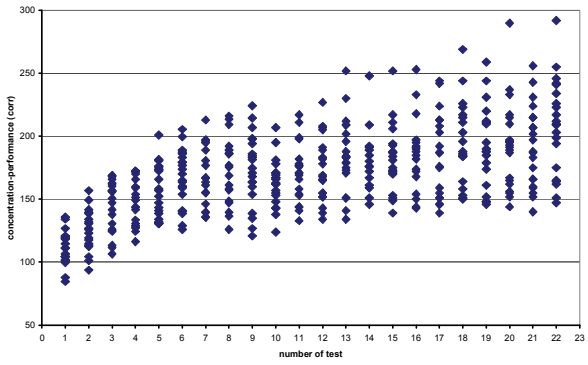
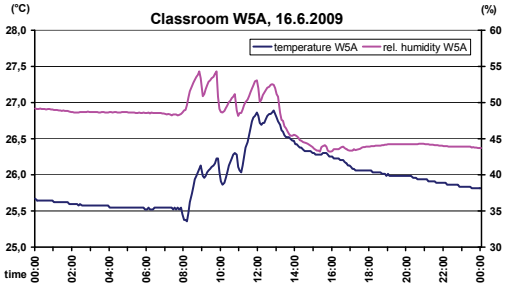
involved in every step of our investigation. We expect that the interpretation of the data will show, if a correlation between temperature and concentration ability can be established with the chosen methods. Students and scientists want to understand the influence of different rooms at various weather conditions and occupancy patterns. Using this information, they want to work out simple measures in order to improve the indoor climate. Every participating student will receive her/his "own data" (results of the concentration tests) and will be able to pinpoint different factors influencing her/his concentration ability.

Feedback surveys of the students will show, whether our project has provided any further benefits beyond the scientific knowledge gained. Two surveys are already finished and a third one will take place once the work with the students is completed.

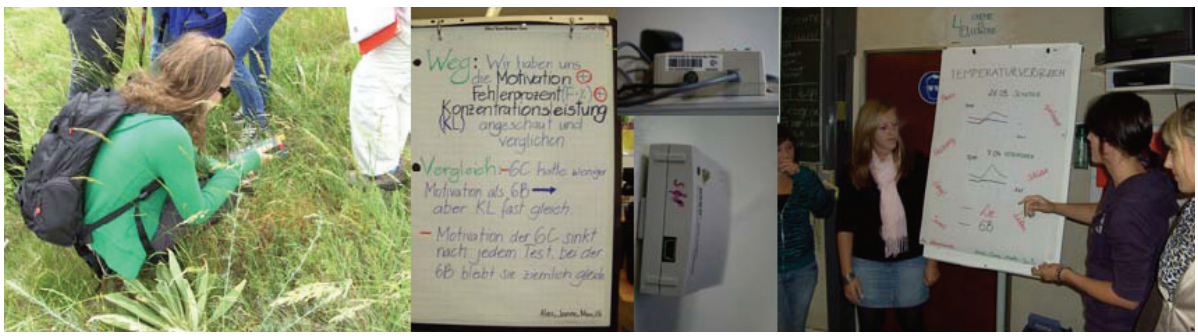


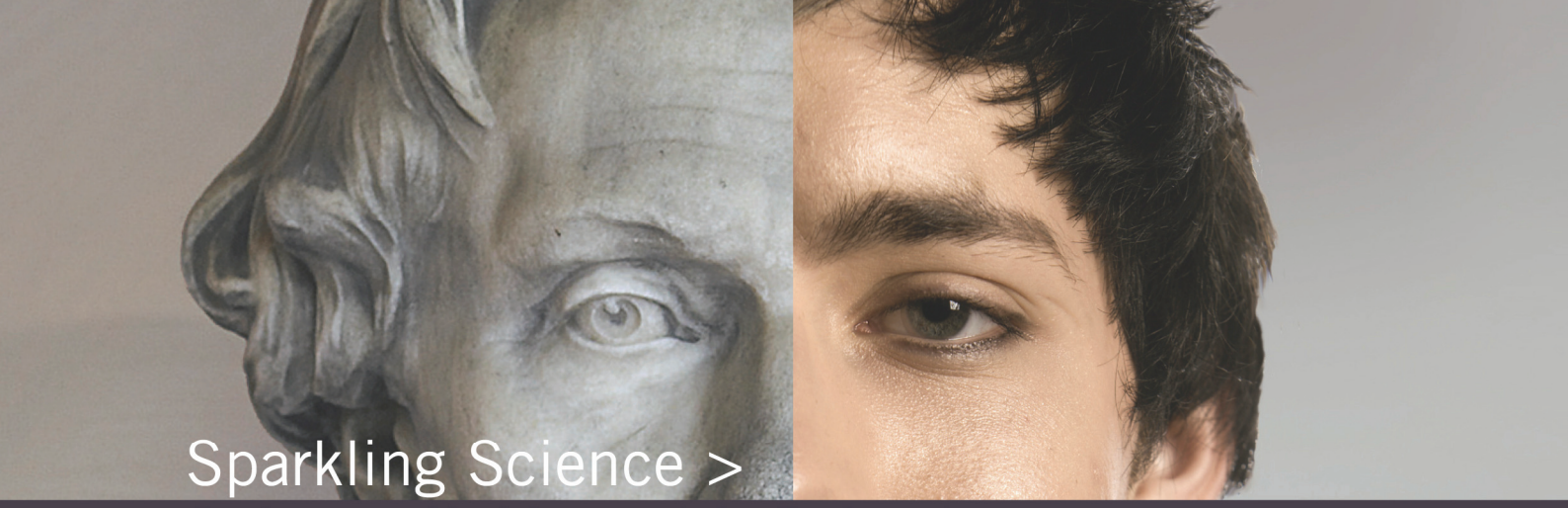


The left figure shows the progress of the concentration ability tests in the class K6B of the Gymnasium Kremszeile. Note the learning effect due to tests repetition! Our next goal is to quantify this learning effect. We assume that the deviation from the learning curve is only affected by heat or other factors.

The right figure shows a typical school day in the class W5A of the Wiedner Gymnasium described by the variations of air temperature and relative humidity. The school day start at 8 o´clock, the ventilation of the classroom during breaks or the decreasing number of people in the afternoon can be clearly identified.

The result of this joint work of students, teachers, and scientists will be presented at a public event in spring 2010. A detailed report containing all results of our project, planned for the late summer 2010, will follow.





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