



Sparkling Science >

Science linking with School
School linking with Science

Final Report, December 1st 2010

**KiP * Kids Participation
in Educational Research**



LEADING INSTITUTION

University of Vienna, Austrian Educational
Competence Centre for Biology (AECC BIO)
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SCIENTIFIC CO-OPERATION PARTNERS

University of Vienna: Dept. for Neurobiology and
Cognition Research; Dept. of Conservation Biology,
Vegetation- and Landscape Ecology; Dept. of Marine
Biology; Dept. for Palynology and Structural Botany;
Dept. of Evolutionary Biology
University of Education, Lower Austria
University of Klagenfurt, Institute of Instructional
and School Development, Carinthia

SCHOOLS INVOLVED

GRG 22 Theodor-Kramer-Straße, Vienna; BRG 19 Krottenbachstraße, Vienna;
HLW Wiener Neustadt; BG/BRG Gmünd; Europa- und Sport-Hauptschule
Mautern; BRG 18 Schopenhauerstraße, Vienna; Akademisches Gymnasium
Vienna I; BRG 6 Marchettigasse, Vienna

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Austrian Federal Ministry of
Science and Research

Researching with Scientists and Learning about Scientific Research – Backstage Research

KiP (Kids Participation in Educational Research) invited about 200 students from various Austrian schools to work together with the scientists at five departments at the Faculty of Life Sciences (University of Vienna) to collect research experience. A few snapshots of the students' world of research activities, experiences and results:

NEURO-KiP: Students of BRG 6 Vienna and BG/BRG Gmünd together with the Department of Neurobiology and Cognitive Research (Axel Schmid, Marc Müller) took a close look at the spider *Cupiennius salei*, a model organism. The neurobiologists' reductionist approach of researching behaviors in the laboratory rather than in "the wild" aroused opposition in some of the young researchers. "How should the spider know what a real tree is? You are all just assuming that the spider perceives the surface to be a tree. (...) It just approaches a dark surface, we don't know why." In KiP, laymen and scientists debate the fundamentals of scientific knowledge gain. Didactic secondary research shows that both students and scientists profited.

SEA-KiP: Students of BRG 19 Vienna worked in the Department of Marine Biology (Monika Bright, Ingrid Kolar) with the vent crab (*Bythograea thermydron*). The development of an appropriate research question stemmed from the students' own interests. "We could see if the crabs prefer eating cat food or chocolate." In an intensive dialogue, students and scientists agreed to research the not-yet studied behaviours and morphology of the crab. The results were included in a scientific poster.

PALY-KiP: Students of BRG 18 Vienna and Akademisches Gymnasium Vienna cooperated with Martina Weber from the Department of Palynology and Structural Botany. They dealt in-depth with the theoretical basis of pollen research, compiling a pollen profile for the schools and surrounding area and expanding the scientific pollen database (www.paldat.org) with the samples that they had evaluated.

EVO-KiP: Students of the HLA Wiener Neustadt und GRG 22 Vienna together with Johannes Spaethe from the Department of Evolutionary Biology developed experiments to investigate the orienteering behaviour of mason bees. Based on their research results, the students from the HLA Wiener Neustadt were invited to the 2011 Europe-wide competition "Science on Stage" in Copenhagen.

NAT-KiP: Students of GRG 22 Vienna and HS Mautern were invited by Kathrin Pascher, Department for Conservation Biology, to become acquainted with methods of researching the consequences of genetic engineering. A real scenario provided, among other things, the backdrop for assessing the ecological risk of genetically modified apricots. One student commented, "Maybe a woodpecker will turn into Spiderman when it eats genetically engineered apricot."



Educational Research with Students – Students Change Research

The attitudes of students towards the natural sciences, factors in changing attitudes and the effect of learning environments for the development of scientific understanding are often the subjects of didactic research. In this type of research, students are objectified. There are indeed deficits that can be complained about: the students' specific view of data, their finding and deductions all get lost in the research. This is where KiP comes in: Students, together with teachers and educational researchers, examine their own learning environments and the development of scientific understanding.

Development of Scientific Understanding through Mutual Research

"Well, research is much more than just observing where animals look for a habitat." Student (age 14)

KiP deals with three dimensions of scientific understanding: modelling, arguing and the development of "images of science". The question, which images of science the students had at the beginning and at the end of the project, was examined during initial and follow-up conversations with the students. The results indicate that the work undertaken with the scientists left its mark on the students' way of thinking. The initial images were undistinguishable: Science is what is learned in school subjects. At the end of the project, the images were multi-faceted with profound arguments, "Natural science is when you can prove something, when there is evidence supporting it. There is evidence for gravity – drop an apple and it falls to the ground. For the theory of evolution, there isn't really evidence." Students' ideas are reminiscent of Popper's arguments when they say things such as, "When several people have examined something and it holds to be true each time, then it is scientific." It can be inferred from such figures of thought that students tend to have positive attitudes.

What was happening elsewhere – Action Research in KiP

Three teachers investigated their classroom activities, asking their own questions by case study research:

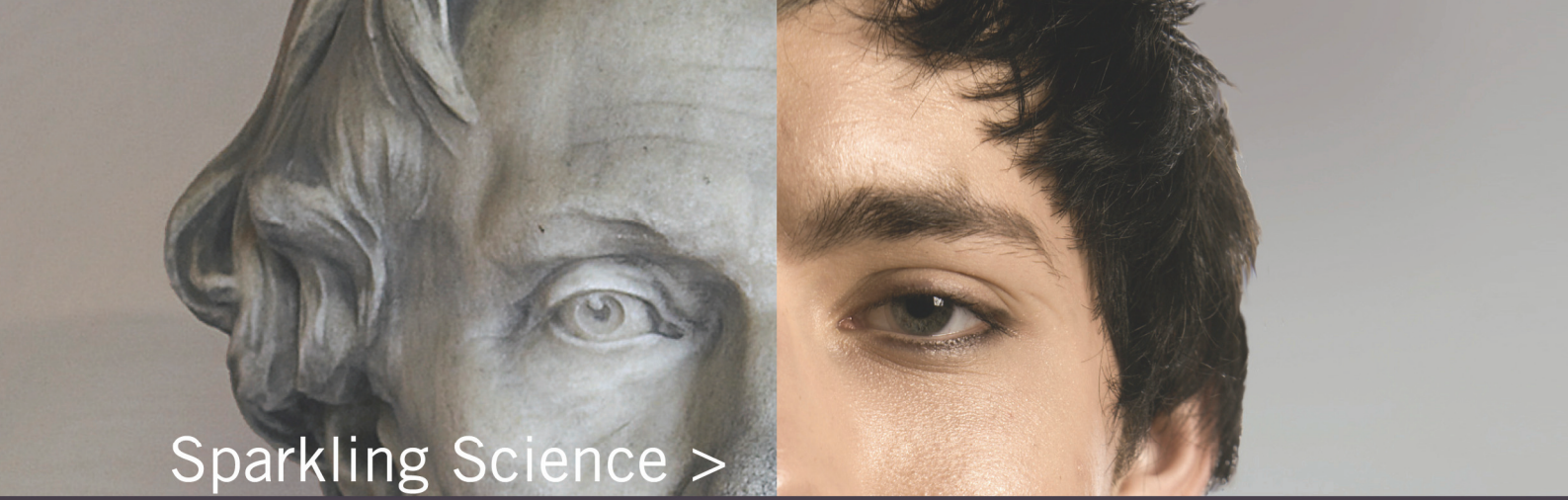
- coping with heterogeneity – not everyone is equally interested in actual research
- integration of the project into the curriculum
- conflict of roles in the specific learning environments of KiP

The ongoing process of collaboration was investigated by case study research supporting evidence-based modelling of a framework of successful cooperation between school and university and fostering the collaboration of students and researchers as well.

Further Information

<http://aeccbio.univie.ac.at/KiP>





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