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UNIVERSITÄT
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Press Release

Successful promotion of giftedness as early as elementary school age

New studies examine the effects of enrichment courses for gifted children

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Tübingen, 19 January 2018

Associations such as the National Association for Gifted Children (NAGC) and the European Council for High Ability (ECHA) have argued that the specific needs of gifted children are often neglected, resulting in a shriveling of their abilities and potential. Consequently, they call for the implementation of programs that specifically aim to promote gifted children. Together with colleagues at the German Institute of International Educational Research (DIPF), scientists at the Hector Research Institute of Education Sciences and Psychology at the University of Tübingen have examined how giftedness can be fostered as early as in elementary school. In several studies, they found that students' grades in Math and German further improved after participating in an enrichment program. Also, after attending a specific class, children developed a remarkably mature understanding of science. Furthermore, participating in a speech training helped children to develop an excellent ability to present scientific content. The study results have now been published in *Learning and Instruction*, *Contemporary Educational Psychology,* and the *Journal of Research on Educational Effectiveness.*

Germany offers various options for the promotion of gifted and highly gifted children and teenagers. They might start school early, skip grades, or study with additional, extracurricular materials in "enrichment programs." So far, only a few of those programs have been evaluated with regard to their effectiveness. Hence, the Tübingen researchers monitored and analyzed an enrichment program for gifted elementary school children. They were interested in finding out whether the courses had positive effects on the participating children and if so, under which conditions.

They conducted their studies at the Hector Children's Academies, which offer extracurricular courses for gifted and highly gifted elementary school children at 65 locations in the state of Baden-Württemberg. The courses

focus on STEM subjects: science, technology, engineering and mathematics, but also include units from the arts and language. Since the program takes a holistic approach, researchers also examined whether the program has effects on children's cognitive skills, academic achievement, epistemic curiosity, creativity, self-control or social competencies.

Roughly 2,700 students participated in an IQ test and filled out questionnaires before and after attending the program's courses. Also, the grades in German and Math were compared. Here, researchers found the most pronounced effect: students were able to further improve their (already good) grades in both subjects. "This effect might be ascribed to the intellectual and motivational stimuli the children received in the courses. Or it might be related to parents spending more time and money on school-related topics once they know their child has been nominated to participate in a program for gifted children," explains Jessika Golle, first author of the study. "Furthermore, it is also possible that teachers' perceptions change once they know that a child is gifted."

Since the study by Golle and colleagues analyzes the entire program, but not individual components, two additional experimental studies with samples of 117 and 65 children examined the effects of specific courses developed by the researchers themselves. For instance, the course "Little researchers – We work like scientists" was designed to foster children's understanding of science. Students slip into the role of researchers and learn with small experiments how scientists work, for example how to formulate and test hypotheses or to interpret and question results. The study finds that the course significantly fostered children's understanding of science. "Also, they were thirstier for knowledge and showed greater tendencies to enjoy thinking," says Julia Schiefer, who developed the course and conducted the study. Consequently she recommends to already promote the understanding of science in elementary school, particularly for intellectually gifted children.

Another course aimed at promoting informative public speaking competencies of children in third and fourth grade. Presentation skills become more and more significant throughout the whole lifespan and for gifted children it is particularly important to find the right tone when they impart information about topics in which they are very knowledgeable. The speech training teaches them how to handle stage fright, how non-verbal communication affects their audience and how to write a comprehensive, adequate speech. They picked a topic from the area of science which they were particularly interested in. Children who participated in the training improved with regard to their posture, facial expressions, gestures, and eye-contact, as well as their ability to speak fluently and structure their speech. Evelin Herbein, first author of the study, thus calls for an implementation of speech trainings as early as elementary school. "Building on our course materials, one might think about how the training can be incorporated into school lessons," she says. Ulrich Trautwein, director of the Hector Research Institute of Education Sciences and Psychology summarizes the three studies: "The results are a cause for optimism. Promoting giftedness in elementary school children can work – but we need clearly defined programs, trained course instructors and a continuous, systematic monitoring of effects."

Publications:

- Golle, J., Zettler, I., Rose, N., Trautwein, U., Hasselhorn, M., & Nagengast, B. (2017). Effectiveness of a "grass roots" statewide enrichment program for gifted elementary school

children. *Journal of Research on Educational Effectiveness*. doi:10.1080/19345747.2017.1402396
- Herbein, E., Golle, J., Tibus, M., Schiefer, J., Trautwein, U., & Zettler, I. (2017). Fostering elementary school children's public speaking skills: A randomized controlled trial. *Learning and Instruction*. doi:10.1016/j.learninstruc.2017.10.008
- Schiefer, J., Golle, J., Tibus, M., Trautwein, U., & Oschatz, K. (2017). Elementary school children's understanding of science: The implementation of an extracurricular science intervention. *Contemporary Educational Psychology, 51*, 447-463. doi:10.1016/j.cedpsych.2017.09.011

About the Hector Children's Academy Program:
The Hector Children's Academy Program offers extracurricular courses for gifted and highly gifted primary school children at 65 locations in the state of Baden-Württemberg. The courses offered exceed the regular curriculum by far and cover a broad spectrum of topics with a focus on STEM subjects (science, technology, engineering, and mathematics.). Roughly 22,000 children attended courses in the 2016/17 schoolyear. The courses are financed by the Hector Foundation II and funded by the Ministry for Education, Youth, and Sports Baden-Württemberg. The Hector Research Institute of Education Sciences and Psychology at the University of Tübingen and the German Institute for International Educational Research are charged with the scientific monitoring of the program.

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