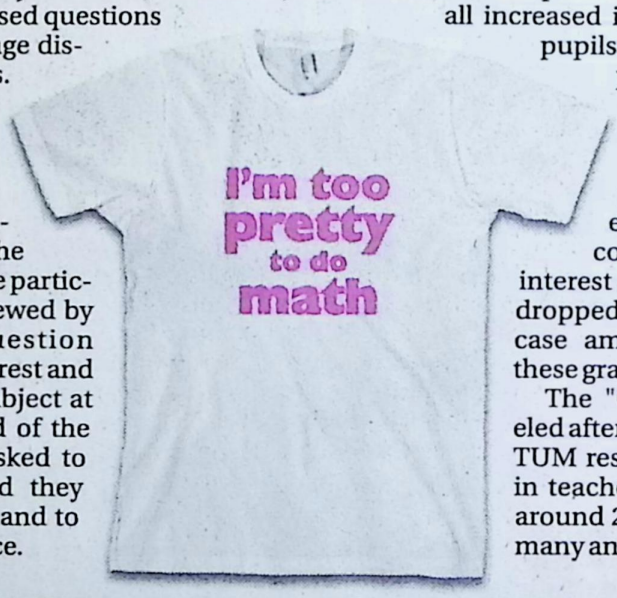
Sudden Interest in Math

How Teachers Can Motivate Pupils

The lack of interest in math or natural sciences is one of the most frequently voiced causes for concern in the debate surrounding education, at least in Germany. It has been seen time and again that pupils lose their enthusiasm for physics, chemistry and math once they reach eighth or ninth grade. But is this inevitable? And if not, how can teachers steer a different course?

Education researchers from TUM school of Education have been investigating classroom dialog -- the way that teachers and pupils communicate with each other. They observe that most math and science teachers use a rigid style of communication to get their subject across. Their teaching methods involve closed questions and they hardly ever encourage discussion among the pupils. Furthermore, they rarely give feedback.

A control group of teachers attended traditional professional development training on the same topic at the same time. The pupils of all the participating teachers were interviewed by the researchers. One question explored the pupils' basic interest and perceived strength in each subject at the start and then at the end of the year. The pupils were also asked to comment on how motivated they were at the end of each class and to assess their level of competence.

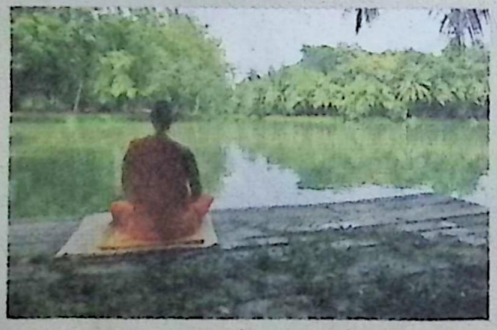


The research showed that interest in the subject, motivation and perceived competence level all increased in the majority of the pupils whose teachers had participated in the new professional development program. For most of the pupils whose teachers belonged to the control group, however, interest and motivation levels dropped, as is typically the case among school-goers in these grades.

The "Observer" test, modeled after this new approach by TUM researchers is now used in teacher training courses at around 25 universities in Germany and Switzerland.

Gene Expression Changes With Meditation

With evidence growing that meditation can have beneficial health effects, scientists have sought to understand how these practices physically affect the body.



A new study by researchers in Wisconsin, Spain, and France reports the first evidence of specific molecular changes in the body following a period of mindfulness meditation.

The study investigated the effects of a day of intensive mindfulness practice in a group of experienced meditators, compared to a group of untrained control subjects who engaged in quiet non-meditative activities. After eight hours of mindfulness practice, the meditators showed a range of genetic and molecular differences, including altered levels of gene-regulating machinery and reduced levels of pro-inflammatory genes, which in turn correlated with faster physical recovery from a stressful situation.

Mindfulness-based trainings have shown beneficial effects on inflammatory disorders in prior clinical studies and are endorsed by the American Heart Association as a preventative intervention. The new results provide a possible biological mechanism for therapeutic effects.

Perhaps surprisingly, the researchers say, there was no difference in the tested genes between the two groups of people at the start of the study. The observed effects were seen only in the meditators following mindfulness practice. In addition, several other DNA-modifying genes showed no differences between groups, suggesting that the mindfulness practice specifically affected certain regulatory pathways.