



Building Interdisciplinary Bridges Across Cultures

## Hannu Salmi & Kristóf Fenyvesi

### Abstract

Our Science generally means the natural and physical sciences and is often limited to physics, chemistry and biology. However, in German, Swedish, Hungarian, or Finnish, the words 'Wissenschaft', 'vetenskap', 'tudomány', and 'tiede' include the humanities, history, psychology, social science or linguistics. The recent changes in science research and education policy also remind us, that the STEM (Science, Technology, Engineering and Mathematics) approach needs to be complemented with the arts. STEM need to be connected also with the humanities and need to be changed to STEAM. The empirical part of the presentation introduces the role of motivation and interest in explaining learning outcomes of 12-13 years-old girls and boys during the "Discover the Art of Mathematics" STEAM exhibitions. The results were drawn from answers of totally 2248 pupils from Sweden, Finland, Estonia and Latvia. Gender differences and the practical implications of the findings are discussed. The analyses showed that the pupils did learn during the exhibition based on the increased test scores in the post-tests measuring the content knowledge of the exhibition. In the light of our survey results, an essential task for STEAM exhibition organizers would be to promote situational interest and its cultivation into a long-lasting interest and intrinsic motivation. While trying to address the widening gap between the demands of scientific literacy, general mathematical competence and increasingly computational and digital contemporary culture, the power of curiosity, imagination, and playful problem solving activities can be utilized.

### Bio

Hannu Salmi is Professor of Science Centre Pedagogy in the University of Helsinki, Department of Teacher Education. Between 2003-2008 he was a professor of Science Communication in the University of Dalarna Sweden. He has also a wide experience of science centres as Director of Research in Heureka, the Finnish Science Centre. He has been coordinator and partner in more than 20 European R&D projects like

Hands-on&Brains-on and INSPIRE. He has been also a member of the advisory board of EU Commission DG Research in Science and Society programmes. Prof. Salmi also was a key expert while creating the new Science Education Strategy 2020 of Finland by Ministry of Education. His main research areas are informal learning, science centres, motivation and open learning environments. Kristóf Fenyvesi is a researcher at the University of Jyväskylä. He is Director of Community Events at The Bridges Organization and CEO of The International Symmetry Association and Director of The Experience Workshop Math-Art Movement.

