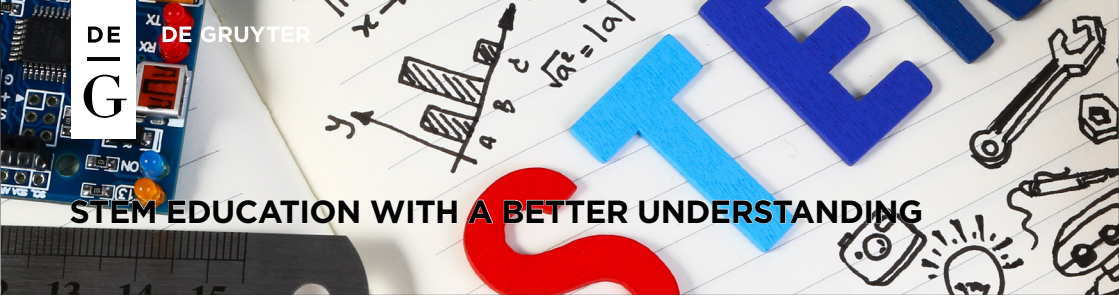

STEM EDUCATION WITH A BETTER UNDERSTANDING

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DESCRIPTION

According Breiner et al. (2012) acronym STEM (Science, Technology, Engineering, and Mathematics) has become very frequently used among many stakeholders in the school policy. According to El Nagdi et al. (2018) real-world problems are complex and inherently multidisciplinary. Tackling such problems requires not just the ability to use design thinking or inquiry, but also the ability to choose the best approach or combination of approaches that capitalizes on the strengths of each way of thinking. From this perspective, STEM encompasses the content, skills, and ways of thinking of each of the disciplines, but it also includes an understanding of the interactions between the disciplines and the ways they support and complement each other.

It is important for each STEM discipline in education to build notions with better understanding by each learner. For example in the case of mathematics Wittmann (1998) states, that like the education of other subjects, mathematics education requires the crossing of boundaries between disciplines and depends on results and methods of considerably diverse fields, including mathematics, pedagogy, sociology, psychology, history of science and others. The core of mathematics education also covers following activities:

- analysis of mathematical activities and of mathematical ways of thinking,
- development of local theories (for example, on mathematizing, problem solving, proving and practising skills),
- exploration of possible contents that focusses on making them accessible to learners,
- critical examination and justification of contents in view of the general goals of mathematics teaching,
- research into the pre-requisites of learning and into the teaching/learning processes,
- development and evaluation of substantial teaching units, classes of teaching units and curricula,
- development of methods for planning, teaching, observing and analysing lessons, and
- inclusion of the history of mathematics education.

Similar situation takes place in education of other subjects related to STEM school subjects (physics, biology or chemistry education).

If we like to arrange that learners better understand the notions during the STEM education, we will have to find the ways how to work with understanding barriers by learners and different kind of obstacles (see Mayer, 2005 and Sierpinska, 1987, 1990). It is forced to respect the process of gaining knowledge in education (see Hejný et al., 2006).

Visualisation through educational software can play an important role in this context (see Fuchs, Plangg, 2018 and Bender, Schreiber, 1985). Opens source software such as GeoGebra (see Hohenwarter, Lavicza, 2007) is a good tool for preparing different applets for STEM education (Micheuz et al., 2007).

ARTICLES

Calculators as Facilitators of Understanding Computational and Mathematical Contexts
Jan Guncaga, Lilla Korenova, Jozef Hvorecky
doi.org/10.1515/edu-2019-0012

Students' Concepts of the Trapezoid at the End of Lower Secondary Level Education
Zdeněk Halas, Jarmila Robová, Vlasta Moravcová, Jana Hromadová
doi.org/10.1515/edu-2019-0013

KIKS Creativity and Technology for All
Anthony Houghton, Adrian Oldknow, Kristof Fenyvesi, Jose Diego-Mantecon, Elizabeth Crilly, Zsolt Lavicza
doi.org/10.1515/edu-2019-0014

Mathematical and Coding Lessons Based on Creative Origami Activities
Natalija Budinski, Zsolt Lavicza, Kristof Fenyvesi, Miroslav Novta
doi.org/10.1515/edu-2019-0016

Linking Photography and Mathematics with the Use of Technology
Karina Amalia Rizzo, Laura Sombra del Río, Mónica Ester Manceñido, Zsolt Lavicza, Tony Houghton
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