

Reacting to society's math-containing information and materials - Why and how

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One of the tendencies that seems to be of growing importance in discussions on how to plan and conduct mathematics education might be termed 'applications of mathematics more than pure mathematics'. This tendency is relevant to explore in depth. A highly important issue for social, political and cultural awareness in mathematics education is how the world outside educational settings is represented and reconstructed inside educational settings.

Three qualitatively different ways of representing and reconstructing 'reality' inside mathematics classrooms might be detected as 1) the word problem, 2) the mathematics modelling¹ and 3) the mathematics practice. They provide the participants with quite different possibilities of reacting and relating to mathematics in society.

I will present and exemplify a framework and invite for discussion. The framework deals with how to react or relate to math-containing information and materials in society. The framework consists of two dimensions. One dimension covers the constructive mode, whether you react and relate destructively or constructively. The other dimension covers a numerical aspect, whether you react and relate in a uniform or in a multiform way. It is my hope that the framework might be helpful for both participants and teachers in mathematics education in their joint striving to understand and engage in authentic mathematics information and materials in society. The framework has four distinct types of reactions:

CM, the counter-models are destructive multiform reactions: i.e. you might construct alternative mathematical models to an existing mathematical model in order to eliminate the use of the existing model. If you consider the mathematical model for paying speed penalty as unfair and unjust, you can construct and promote alternative counter-models.

MMS, the many smart methods are constructive multiform reactions: i.e. you might construct and practise calculation methods which easily and effectively help you to know the amount of penalty when you drive a car at a specific speed.

FK, 'Criticism', 'Fach Kritik'(in Danish *fagkritik*²) is destructive uniform reaction. It involves broader criticism of school subjects and sciences, their methods, history and roles in society, and point out the inherent values. For

¹ See for example Verschaffel, Greer and de Corte (2000).

² Leksikon for det 21. århundrede. Udgave 2001-02. <http://www.leksikon.org>

P. Valero & O. Skovsmose (2002) (Eds.). *Proceedings of the 3rd International Mathematics Education and Society Conference*. Copenhagen: Centre for Research in Learning Mathematics, pp. 1-2.

example, you might consider why and how mathematics is used in adjudication of crime, and how this is - or is not - worked on in mathematics education.

FP, The fighting positivism is constructive uniform reaction: i.e. you utilize mathematics as unproblematic tools to investigate and present what you find unjust in the speed penalty system.

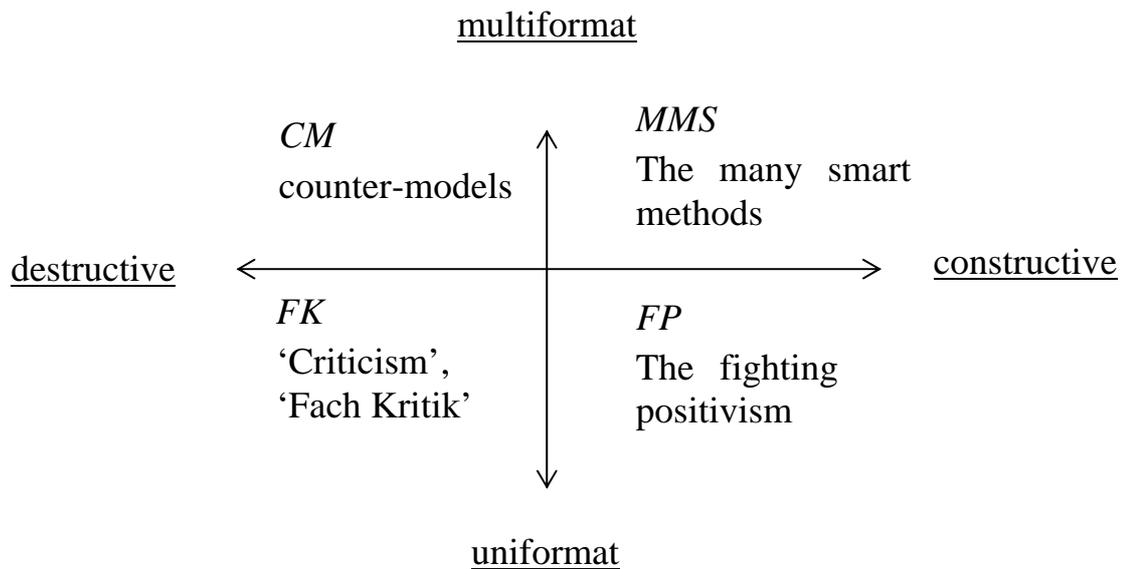


Figure: Two-dimensional framework for reaction

Reference

Verschaffel, L., Greer, B., and de Corte, E. (2000). *Making sense of word problems*. Lisse (The Netherlands): Swets & Zeitlinger.