

Mathematics as a system and process

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In the research methodological article I would like to focus on mathematics as a system and process. A special attention will be paid to the radial and concentric aspect in teaching mathematics. The new standards for school mathematics and the new teaching materials devised for grades four, five and six have been chosen as a basis of the research. We have already considered the theoretical mathematics as a system and process. We will continue with the research (1;2) of the school mathematics by revealing the fundamental role of a special didactic aspect in acquisition and structure of the school mathematics course rather than by linking mathematical topics with the scientific basis of the school mathematics (which, of course, a teacher must know).

The following issues are offered for discussion during the conference.

On the possible strengths and weaknesses of the radial and concentric aspect.

The aim of the research does not lie in analysing the hard-to-define concept of mathematics, but in looking at the mathematics from a slightly non-traditional point of view. Mathematics is the discipline where dialectics can be noticed - that black is not only black; that upon a “slight” change of an angle from 89° to 91° , the tangent function changes the “value” from $+\infty$ to $-\infty$; philosophically showing, how the quantitative changes evoke qualitative changes; that the area of a triangle can be calculated using the formula for calculation of the area of a trapezium, considering a triangle as a trapezium with one zero length baseline; that $0.(9) = 1.(0)$; and that two! inverse operations are used not only for exponentiation, but also for multiplication, and even for addition.

When researching mathematics as a system, it is important to take into account not only the purpose and objectives for acquisition of mathematics, but also the historical traditions. Let us look at mathematics as a system in different periods of time, emphasizing the historical traditions and morality aspects of mathematics in relation to the school mathematics.

. In order to understand mathematics as a system a big role is also played by the understanding of purpose and objectives of mathematics acquisition. According to a held view, it is useful only for the prospective mathematicians to (acquire) understand mathematics as a unified system, however, on the other hand, we are striving to make each student comprehend mathematics as a unified entirety rather than a compilation of isolated facts. Herein the issue becomes topical about the existence of different level understandings on the notion of a “system”. System and process are often inseparable in the school mathematics, and the verities of theoretical mathematics, like a red thread, run through the entire course of mathematics (even beginning from the first grade!).

References

1. Timo Leuders (2003) *Mathematik Didaktik*. Cornlesen.
2. H.Freudental (2001) *Mathematik als Pedagogische Aufgabe*. Stutgard.

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