D.V. Boykova

REPRODUCTION OF MATHEMATICAL KNOWLEDGE IN THE EDUCATIONAL PROCESS FROM THE VIEWPOINT OF HUMANISTIC PHILOSOPHY OF MATHEMATICS

Teaching mathematics may be equally interesting for teachers and philosophers of science. Nonetheless, mathematical education was no popular topic for discussion for a very long time. The main issue was the problem of fundamentals of mathematics. However, mathematical education was no mere transfer of knowledge. Mathematical education is a reproduction of knowledge; moreover, it is a way of existence of mathematical knowledge. In this connection, modern philosophy of mathematics believes that humanism is a relevant area for thorough consideration. In this article, we will talk about it with account for the book of American mathematician and philosopher Reuben Hersh entitled "What's Mathematics, Really?".

One of the main ideas of the humanist philosophy of mathematics is that mathematics is a social, cultural, and historical reality. Mathematics is what mathematicians do. It changes; therefore, the criteria of its strictness change, too. Mathematical education is one of types of mathematical practice. Valid philosophy of mathematics should be compatible with mathematical practice, so, the study of mathematical education falls within the subject matter of the philosophy of science.

Reuben Hersh connects success of mathematical education with the notion of the nature of mathematics. He compares three viewpoints concerning its nature: Platonism, formalism and humanism, and their influence on the mathematical education. Platonism can justify a student who isn't successful in mathematics: mathematical objects are just in the other world and this world isn't available for everyone. Formalism isn't compatible with mathematical practice: mathematical assertions are meaningless symbols. However, whenever one is teaching mathematics, mathematical assertions have the same meanings as they do in the mathematical research. The goal of the education is the understanding rather than formal correctness of sequences of symbols. Humanism accepts informal and incomplete proofs. In addition, R. Hersh demonstrates that there are no formal complete proofs in real mathematics. Mathematics doesn't need them. Students learn mathematics by solving problems, making calculations. And it's not an easy version of mathematics, because in scientific research mathematicians solve problems and make calculations, too. Whatever mathematicians teach determines the rules of mathematics.

Key words: philosophy of mathematics, philosophy of education, humanist philosophy of mathematics, philosophy of science.

References

1. Hersh R. What's Mathematics, Really? Oxford University Press, 1997, 368 p.

2. Davis P.J., Hersh R. The Mathematical Experience. Cambridge, Birkhauser, 1981.

3. Kitcher P. The Nature of Mathematical Knowledge. New York, Oxford University Press, 1983.

4. Ernest P. The Philosophy of Mathematics Education. New York, Falmer, 1991.

5. Asmus V.F. *Problema intuitsii v filosofii i matematike* [The Problem of Intuition in Philosophy and Mathematics]. Moscow, Mysl' Publ., 1965, 312 p.

6. Gil'bert D. Osnovaniya geometrii [Fundamentals of Geometry]. Petrograd, Seyatel' E.V. Vysotskogo Publ., 1923.

7. Veyl' G. Matematicheskoe myshlenie [Mathematical Thinking]. Moscow, Nauka Publ., 1989, 400 p.

8. Tselishchev V.V. Poiski novoy filosofii matematiki [The Search for a New Philosophy of Mathematics]. *Filosofiya nauki* [Philosophy of Science]. 2001, no. 3(11), pp. 135—148.

9. Petrov Yu.P. *Istoriya i filosofiya nauki. Matematika, vychislitel'naya tekhnika, informatika* [History and Philosophy of Science. Mathematics, Computer Facilities, Information Science]. St. Petersburg, BKhV-Peterburg Publ., 2005, 448 p.

10. Uspenskiy V.A. *Prosteyshie primery matematicheskikh dokazatel'stv* [Simplest Examples of Mathematical Proofs]. Moscow, MTsNMO Publ., 2009, 56 p.

11. Davies B. Whither Mathematics? Notices of the American Mathematical Society. December 2005, vol. 52, no. 11.

A b o ut the author: **Boykova Daria Valeryevna** — postgraduate student, Department of Philosophy and Methodology of Science, **Moscow State University (MSU)**, Building 4, 27 Lomonosovskiy prospekt, Moscow, 119991, Russian Federation; Assistant Lecturer, **Moscow State University of Civil Engineering (MGSU)**, 26 Yaroslavskoe shosse, Moscow, 129337, Russian Federation; daria.boikova@gmail.com.

For citation: Boykova D.V. Vosproizvodstvo matematicheskogo znaniya v obrazovateľ nom protsesse s pozitsii gumanisticheskoy filosofii matematiki [Reproduction of Mathematical Knowledge in the Educational Process from the Viewpoint of Humanistic Philosophy of Mathematics]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2012, no. 9, pp. 259—263.