



Katarzyna Szewczuk

ORCID: 0000-0003-1914-6600  
Jesuit University Ignatianum in Krakow



## Success or Failure in the Mathematical Education of the Child (Nie)powodzenia w matematycznej edukacji dziecka

Review: E. Gruszczyk-Kolczyńska (2021). *Jak pomóc dziecku pokonać niepowodzenia w nauce matematyki? Podręcznik dla rodziców, terapeutów i nauczycieli z serii „Dziecięca matematyka”* [How to Help the Child Overcome Math Failures? A Textbook for Parents, Therapists and Teachers from the Series “Children’s Mathematics”], Kraków: CEBP 24.12 Sp. z o.o., 270 pp.

“Math is neither difficult nor boring.  
Especially if we become friends with her  
while we are still children.  
Math is the measure of everything.”  
(Aristotle)

Mathematics—the word that hides immense emotions. Probably each of us has some memories and associations related to mathematical education at school age. For some it was a pleasure, sometimes, when they delved into solving logical and difficult tasks, ending with pride and success. For others, learning mathematics was a nightmare they would prefer to forget, lost and sad time, marked by a streak of failures,

often with a sense of inferiority. And it is the latter experience, which makes some people assume a priori that learning mathematics must be difficult, and perceive it as a cause of failure. The scale of the phenomenon is so large that in the literature we can find such terms as the scourge of mathematical illiteracy (Dąbrowski 2008), mainly blamed on teachers who failed to properly shape mathematical concepts in the minds of children (Karpńska, Remża 2019). This process is particularly important at lower levels of education: pre-school and early school education. Edyta Gruszczyk-Kolczyńska, the author of the publication I reviewed, is lending a helping hand in teaching mathematics at this developmental stage.

Edyta Gruszczyk-Kolczyńska is an unquestionable authority in the field of mathematical education for preschool children. She is known to the public mainly for the series “Matematyka dziecięca” [“Children’s Mathematics”] but let us not forget that she has also authored publications on, inter alia, diagnosis, mathematical education in class I, and mathematically gifted children. This time the author returns to the topic of failure in learning mathematics. One may ask if the publication which to some extent duplicates the subject of the previous author’s work is worth reading (Gruszczyk-Kolczyńska 2014). My answer to this question is an emphatic “Yes,” because the contents of the book are presented in a broader perspective, holistic and complementary to the previous one.

The publication has been divided into two parts. In the first one, we will find some important information on the causes of children’s failures in math. The author describes in detail the consequences of the so-called paper mathematics, i.e. of narrowing mathematical education to fulfilling tasks in exercise books (pp. 19–24), and also shows the correlation between emotions and reasoning (including mathematical thinking). In this section of the book, we will also find information on the importance of supporting and developing operational reasoning in a child (even before going to school) and we will read about the rules that should be followed when working with a child to eliminate failures in learning math. This short compendium of knowledge about failures in the initial learning of mathematics is transparent and understandable to the average reader. The added value of this fragment of the publication are numerous examples, descriptions of many situations that actually took place in classrooms during classes with children. It allows for an even better understanding of the analyzed content; shows the actual and potential consequences of an inadequate formation of mathematical concepts in the minds of children.

The second part of the publication focuses on supporting children in overcoming failures in learning mathematics in selected educational areas. The following aspects are described in detail: counting, calculating, word problems, spatial orientation, geometric intuitions, measurement of length, weight and fluids, time and financial calculations (money math). Each of the above-mentioned themes is treated briefly and

at the same time exhaustively, maintaining more or less the same layout. This means that, first of all, we are given information on the psychological basis of the formation of a given concept in the child's mind. Then we learn about the consequences and errors of the school system of teaching mathematics in selected areas of education. At the very end, we will find numerous suggestions how to assist the child in developing selected mathematical skills. Importantly, the information contained in this part of the publication includes both the diagnosis of and the corrective actions for a given skill. Thus, the reader can independently, by preparing a series of simple tasks, find out at what level the child is in terms of developing a specific skill, and then (if this level is insufficient) propose supporting tasks and games. It should be mentioned that the proposals of both diagnosis and the supporting tasks are described precisely, with attention to detail, and their implementation should not be difficult (they only require objects of everyday use).

*Jak pomóc dziecku pokonać niepowodzenia w nauce matematyki?* [How to Help the Child Overcome Math Failures?] is another of many publications by Edyta Gruszczyk-Kolczyńska. An attentive reader will surely notice numerous repetitions in the theoretical descriptions or examples of games provided by the author. On the other hand, he receives one book in which the content and ideas analyzed in many publications are collected. The issues related to the mathematical education of children are ordered and analyzed in terms of supporting their development. I think that the overriding goal of the book was to provide a tool that will help adults in the correct formation of mathematical concepts (based on psychological foundations) and help them notice and eliminate the mistakes that have been made so far. For those who are not convinced by the above arguments and are not influenced by the authority of the author herself, I would like to add another argument: *Repetitio est mater studiorum*.

The publication combines the simplicity of language with the professionalism of content. It is addressed to a wide audience, to all people who are not indifferent to the fate of children who fail to learn mathematics. In this context, it is worth mentioning that the prevalence of failures in mathematics does not decrease, and despite the use of various didactic and compensatory classes, it remains at a constant level (Czajkowska et al., 2015a, 2015b). For this reason, in the first place, I recommend the book to the teachers and students of pedagogy. The former will have the opportunity to verify and expand the methods of mathematical education of the child. The latter, on the other hand, will be prevented from making mistakes while forming mathematical concepts in the minds of future students. Undoubtedly, the publication should also be read by parents of children in preschool and early school age. Thanks to the content of the publication, they will be able to diagnose selected mathematical skills of a child and, if necessary, they will be able to introduce corrective measures. In this way, they will

give their child a better start in learning math or will eliminate the obstacles that have caused the aversion to the Queen of the Sciences.

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## ADDRESS FOR CORRESPONDENCE

Katarzyna Szewczuk  
Jesuit University Ignatianum in Krakow  
e-mail: katarzyna.szewczuk@ignatianum.edu.pl