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"About Children with Mathematical Skills. A Book for Parents and Teachers", ed. E. Gruszczyk-Kolczyńska, Warsaw 2012 : [recenzja]

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Review of the publication: E. Gruszczyk-Kolczyńska (ed.), "About Children with Mathematical Skills. A Book for Parents and Teachers"

If I feel like chatting while on board a plane,
I answer a neighbour's question "What do you do?" by saying
"I am a lawyer".
Otherwise, if I need silence and peace, I'd rather say
"I am a mathematician".
(M. W. Gray).

"Mathematics is the queen of all sciences" – is a common, often over-used, saying, but still valid, in spite of the time which has passed since it was first uttered. There is no other science in the world which is equally comprehensive and, at the same time, so transparent and specific in terms of its assumptions. Contrary to other scientific disciplines, mathematics is never outdated, and it would be difficult to challenge the soundness of reasoning presented long ago. Mathematics supports the development of logical thinking, solving problems, perceiving its background in various situations in everyday life. The development of contemporary society would not be possible without the knowledge contributed by this scientific discipline. Man would not be able to construct a bridge, an aircraft or a computer without applying the basic assumptions of mathematics. Thus, we owe all the dynamic transformations of the civilised world to mathematics. Given the above statements, we should be concerned about this education of children, which serves to foster the development and shaping of mathematical knowledge and

activity. However, working with a group of children during school classes usually results in the adjustment of the pace and scope of learning to the abilities of an average student. Consequently, the needs of children with stronger mathematical skills are neglected. The ways to identify such skills and the methods to work with such children can be found in the publication under review.

The editor-in-chief of the book under discussion is E. Gruszczyk-Kołczyńska. I think that those who are interested in the mathematical education of children do not need to be introduced to this education specialist. Her numerous publications concerning the mathematical education of kindergarten children, as well as her comprehensive knowledge and skills of its communication, may serve as an incentive to encourage the reading of the book under review. Unquestionably, the authority of the author herself may affect the readers as a magnet attracting a wide range of audience.

The publication is the first book entirely devoted to children with mathematical skills. The knowledge of mathematical skills in children has so far been rather superficial and modest. There are several guidebooks related to supporting the development and education of talented children; however, they usually focus on the presentation of interesting mathematical tasks. The majority of people interested in the issues under discussion are convinced that the only way to develop talented children's minds is to make them resolve such tasks. The editor of the publication is definitely opposed to such a standpoint. Throughout her book she proposes a programme of supporting the intellectual development and education of mathematically talented children at home, in the kindergarten and at school. The programme was divided into ten parts, and each of them is accompanied by theoretical comments and a series of tasks recommended for execution by a child. The whole text is supported by numerous footnotes containing methodological and psychological comments. Their in-depth analysis guarantees success when it comes to the development of young students' mathematical skills, both throughout their school and home education. However, it should be kept in mind that most of the exercises and tasks proposed in the programme have

been described in the other publications of E. Gruszczyk-Kołczyńska. This is confirmed in many of the references re-directing readers to more detailed descriptions of the tasks presented.

The preparation of the publication was preceded by over 40 years of educational experience and intensive scientific research. The results of these studies explicitly indicate that mathematical skills are not only reserved for older students, using more advanced mathematical knowledge or ranked high in mathematical competitions. As E. Gruszczyk-Kołczyńska argues persuasively, mathematical skills have already been demonstrated by older kindergarten children and young students, and there are many children with distinguished skills in this group. The monograph has also undermined another myth resulting in the claim that mathematical skills are rare and occur occasionally. Over a half of the children studied by the author demonstrated well-developed mathematical skills. However, if we want them to be manifested throughout further educational process, appropriate conditions must be created at school and at home. Such conditions should include supporting the intellectual development of children, fostering the skills and extended education in the field in which the skills are demonstrated. Only these kinds of activities shall provide the children with the opportunity to develop their own skills and be successful. However, one should be aware of how to organise such activities and how to support a child with mathematical skills.

The book under review is not only limited to a description of the knowledge and skills of children which may reflect their mathematical skills. It also offers diagnostic tools which, once applied properly, enable teachers and also parents to find out what their children know and what they are able to do in the selected scope of mathematical activity, as well as to draw conclusions on children's skills. The diagnosis consists of two segments. The first one covers screening tests in which all children participate. It has been designed so that a teacher may simultaneously implement the educational goals and the diagnostic goals. It may be successfully carried out during morning hours within mathematical education classes, with the entire group of students collectively. Its main objective is to select children weaker than their peers, representing the

average level of knowledge and skills and children who are distinguished in terms of their knowledge and skills within their mathematical activity. The first segment of the diagnosis consists of two experiments, and each of them contains the description of introductory exercises and a series of diagnostic tasks. On the other hand, the second segment of the diagnosis is based on individual studies. This segment covers children who outperform their peers in terms of their knowledge and skills. It also consists of two diagnostic experiments, each of which has been described in the form of a study scenario. Both the first and the second segments of the diagnosis is described in detail, contains criteria for evaluating a child's competence as well as interpretation of guidelines and conclusions which may encourage the introduction of changes in the area of the mathematical education of children. The tasks proposed by the author, contained in the diagnosis under discussion, are accessible and feasible to implement both by teachers and by parents interested in the mathematical education of their own children.

The proposed support of mathematical skills is not closed within the educational process of younger students. In the fifth part of the publication one can find information concerning the development of mathematical skills of children in class 4. The essence and importance of passing from operational reasoning at a specific level to operational reasoning at a formal level is also indicated. E. Gruszczyk-Kolczyńska observes that the majority of teachers of mathematics assume that students in class 4 already demonstrate operational reasoning at a formal level and adjust the process of mathematical education to such intellectual competence. Likewise, the authors of educational packages for children of this age group develop them taking into account these assumptions. Therefore, it is necessary to support children in gathering the experience that will develop their intellectual ability and, at the same time, will contribute to the development of their mathematical skills. A child may gain such experience by resolving tasks tailored to its needs. Thus, in this part of the publication, one can find examples of tasks contributing to the development of the hypothetical- deduction reasoning and combination reasoning as well as the methodological comments for teachers and parents.

The book combines the simplicity of the language with the professionalism of information. It is addressed to a wide group of readers, both teachers and parents, as well as university students – future teachers. It contains numerous examples that illustrate the content that is presented. The book has been written by several authors who skilfully tackle the current problems and communicate important messages. Respecting the ideas contained in the book shall undoubtedly contribute to supporting the development and education of mathematically talented children.

Reviewed publication:

E. Gruszczyk-Kolczyńska (ed.)

"About Children with Mathematical Skills. A Book for Parents and Teachers"

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