

Book Reviews

Mehmet Fatih TAŞAR, Section Editor
Gazi Üniversitesi, Ankara, TURKEY

KURAMDAN UYGULAMAYA MATEMATİK EĞİTİMİ (MATHEMATICS EDUCATION FROM THEORY INTO PRACTICE)

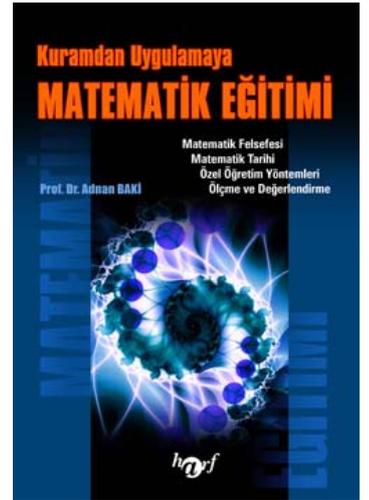
By Adnan Baki

2008

Harf Eğitim Yayıncılığı, Ankara, Turkey

xi+ 647 pp.

ISBN 978-975-6048-39-9 (hard cover)



With developing science and technology human beings are trying to cope with the resulting changes. In this adaptation process, mathematics education has an important potential in improving individuals' creativity, reasoning and problem solving skills. Nowadays mathematics instruction requires people to gain some mathematical features: (i) using mathematical rules/formulas properly, (ii) performing arithmetic operation (iii) having a higher level mathematical thinking, and (iv) becoming a good problem solver. Of course, such trends/expectations depend on changes in both learners' and teachers' views of learning and teaching. With this purpose, in Turkey, as a case of developing countries, contemporary learning and teaching approaches have been taken into consideration to implement them practically. To overcome these theoretical, pedagogical and practical deficiencies towards contemporary approaches of learning and teaching, to inform teachers and student teachers on these new mathematics teaching programs, source books need to be written and provided. The book under review also presents important literature at the end of each chapter for readers who wish to obtain further information about related topics.

In the first chapter, nature of mathematics is explicated concerning school mathematics and academic

mathematics separately and deeply. In this chapter following topics are discussed: definition of mathematics, whether mathematics is discovery or invention, distinguishing modern and classical mathematics, tools used by mathematicians, purpose of teaching mathematics in schools, the aesthetic and fun aspects of mathematics, approaches and sorts of questions and proofs which mathematicians use in their teaching activities and topics related to nature of mathematics are discussed with examples. In summary, in the first chapter philosophy of mathematics education, discussions made by philosophy of mathematics education on the nature of mathematics, social groups affected by these discussions are introduced. Then the sorts of results that can be obtained from these discussions are explicated and the importance of these results for mathematics educators are emphasized.

In the second chapter, the value of history of mathematics for mathematics education, mathematics arising from daily needs, Mathematics in Ancient Greek, the Islamic-world mathematicians and contemporary mathematics are introduced and how teachers can enrich their teaching activities by adding history of mathematics are discussed. Briefly, based on the structure of mathematics introduced in the first chapter,

in the second chapter how mathematics shapes our world of thought and how it helps us get to know the universe are discussed. Additionally, lives, philosophies, works, and contributions of famous mathematicians are presented in a historical perspective based on their countries and cultures.

In the third chapter, some learning theories and related terms are introduced (e.g. learning areas, (cognitive, emotional, and psychomotor domains; learning approaches, learning through group works, learning through problem solving, teaching methods and multiple intelligences theory). Then how these theories can be reflected to classroom settings with sample activities are discussed. Shortly, in this chapter learning theories were explicated in detail and how these theories could be projected to classroom settings are discussed.

In the fourth chapter, operational and conceptual learning and how misconceptions could be determined were examined. By considering students' ways of learning mathematics and what misunderstandings they might have in some subjects (such as numbers, algebra, analysis, geometry etc.), the requirement of balance of operational and conceptual learning was emphasized. Moreover, in this chapter levels of geometric understanding were introduced in detail.

In the fifth chapter, the main objects of school mathematics were dealt with and what main domains of mathematics teaching program should have included was discussed. The philosophy and vision of new mathematics teaching programs (primary and secondary programs) and changes in teachers' roles according to new mathematics teaching programs was expressed and assessed from different aspects.

In the sixth chapter, substantial concepts about a teaching program and its main elements were introduced. Cognitive, emotional and psychomotor teaching domains' features, their classification and examples of them were represented. Strengths and weaknesses of teaching methods could be used in teaching settings were argued, and moreover, teaching principles and how mathematics lessons should be planned was emphasized. After the validity and reliability concepts were discussed within the context of evaluating of learning, features of several measurement and evaluation tools used for assessing of learning domains were referred. Furthermore, it was stressed on how assessment should be done and then alternative assessment approaches besides classical ones were introduced with examples.

In the seventh chapter, after from how computer-assisted teaching is understood and how it has been applied so far was explained. The innovations and changes brought by information technology to mathematics education in general and ones brought particularly by computer technology was discussed. In

addition, the potentials of these technologies for mathematics teaching were expounded and how to add these technologies in teaching-learning process was addressed with sample activities which were selected from mathematics subjects (primary, secondary and higher education programs). We believed that these sample activities would help readers to get some new perspectives in teaching-learning mathematics.

Finally in the eighth chapter, how recommendations (given previous chapters such as teaching mathematics considering nature of mathematics, constructing individual mathematics by students actively, and balance of operational and conceptual learning) could be reflected on teaching-learning activities was presented with examples. These sample activities were selected from mathematics subjects (primary, secondary and higher education programs) such as basic calculations, rational numbers, algebraic operations, matrices, set concept, function concept and its teaching, analyze subjects, conics, graphics. We hope that these sample activities would help readers to embrace contemporary teaching approaches.

This book, named as "*Mathematics Education Theory to Practice*" is one of the earliest resources published on mathematics education in Turkey. Comparing with some other books, it can be said that this book has a more comprehensive and rich content. The aims of this book includes to inform readers about problems discussed in mathematics education, theories and approaches concerning teaching-learning, results and recommendations coming from researches on mathematics education, mathematical activities appropriate modern education approaches and their application in classroom, and how students learn mathematics. In this context, this book presents samples activities that applicable in classrooms. Contrary to previous books written in mathematics education in Turkey, this book has a potential to reveal the beauty, mystery, aesthetic and attraction of mathematics besides overcoming deficiencies mentioned in the first paragraph. Considering that mathematics' beauty, feature of encouragement of thinking and usefulness, has long been ignored, the value of this book increases more. So we hope that this book would help both teachers- student teachers and educators and researchers who master on mathematics education to construct their own models and philosophies according to modern education approaches in the process of application new mathematics programs.

Written in Turkish, this book is fluent and can be understood easily. This Hard covered book has 647 pages. This book includes the content of five main topics (i.e. philosophy of mathematics education, history of mathematics, special teaching methods, computer-assisted mathematics teaching, and measurement-

evaluation). Consequently, we think that the book can fill a big gap in the mathematics education in Turkey.

Davut Köğçe, Research Assistant

Karadeniz Technical University, Fatih Faculty of Education
Department of Elementary Mathematics Education
61335 Trabzon / Turkey
E-mail: d_kogce@yahoo.com

Mehmet AYDIN, Research Assistant

Karadeniz Technical University, Fatih Faculty of Education
Department of Secondary Mathematics Education
61335 Trabzon / Turkey
E-mail: Maydin2005@ktu.edu.tr

Cemalettin YILDIZ, Research Assistant

Karadeniz Technical University, Fatih Faculty of Education
Department of Elementary Mathematics Education
61335 Trabzon / Turkey
E-mail: cemalyildiz61@hotmail.com