

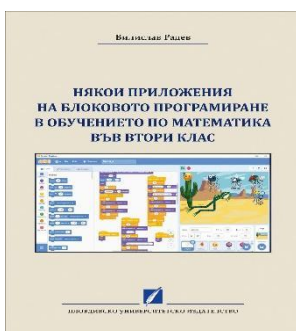
ANNOTATIONS OF SCIENTIFIC PAPERS ON CHAPTER AC. Dr. VILISLAV IVANOV RADEV

To participate in a competition for the academic position " **docent** " in:
field of higher education **1. Pedagogical sciences** ; professional direction **1.3. Pedagogy of training in...** (Methodology of training in information technology and working in a digital environment)

14 scientific works are submitted for participation in the competition: 2 monographs, 12 scientific articles, of which 9 are in Bulgarian and 5 in English. All of them were developed and published after acquiring the ONS "doctor".

MONOGRAPHS

- 1. Radev V.,** Some applications of block programming in the teaching of mathematics in the second grade, University of Plovdiv Publishing House , 2023, ISBN 978-619-7663-58-7



This monograph is a collection of game models focusing on some applications of block programming in second grade mathematics education.

The book is intended for educators using information technology as an aid to visualizing the learning material in mathematics classes.

The **first chapter** briefly discusses some aspects regarding the application of modern information technology and educational software products as a means of learning in primary school, supporting the process of more effectively achieving learning goals in various learning subjects, and more specifically in mathematics learning . In **the second chapter** , the goals, tasks, object, subject and hypothesis of the conducted pedagogical research are formulated. **A third chapter** is devoted to the design of a prototype of an educational animated mathematics module for second grade by using the Scratch block programming language. Nine implemented animated modules are presented, and for each of them its pedagogical characteristics are discussed, the corresponding scenario and the technological implementation itself are presented. The results of the conducted pedagogical experiment are presented in **the fourth chapter** .

- 2. Radev V.,** Studying discrete mathematics with the help of information technologies , University of Plovdiv publishing house , 2023, ISBN 978-619-7663-57-0



The monographic work is dedicated to a current topic. It presents the modern trends for the development of mathematical competences in discrete mathematics with the help of information technologies. The book is intended for pedagogues, researchers and students who are interested in the teaching methodology of discrete mathematics in education.

The **first chapter** of this book details the LogicalCircuits (LC) combinational circuit builder for representing Boolean functions for educational purposes. With its clean vision, prepared and in accordance with the basic principles in the design and construction of interfaces, the LC is intended to support the study of the theory of Boolean functions in lecture courses of discrete mathematics in universities as well as in profiled training in informatics in secondary schools.

A second chapter is devoted to a simulator of Post and Turing machines, Turing machines are examined, their computational capabilities are explored, and the Post machine is examined, comparing its capabilities with those of a Turing machine. With the help of the Post and Turing machine simulator, mathematical models of the two machines are presented and implemented.

The third chapter presents a methodological toolkit for visualization of solutions to various tasks in discrete mathematics. Examples and exercises implemented using Macromedia Flash have been created to support the teaching of set theory, combinatorics and graph theory. For the study of logical (Boolean) functions, example developments using the graphic constructor LC are presented. For the study of the different number systems, examples are given, realized with the help of Microsoft Excel. Also shown are solutions to problems using the graphical software for experimenting with formal languages JFLAP. Finally, tasks implemented using the Post and Turing simulator are presented.

SCIENTIFIC ARTICLES IN BULGARIAN LANGUAGE

3. **Radev V.** , Addition and subtraction of numbers up to 1000 without crossing using Scratch. In: Pedagogy, Sofia, NION "Az-buki", 2023 , ISSN 1314–8540 (Online) , ISSN 0861–3982 (Print) , <https://doi.org/10.53656/ped2023-2.10>



The article is devoted to the application of information technologies in the creation of educational games for the acquisition of new knowledge in primary school. Specialized Scratch software for introducing children to computer culture is reviewed. The basis for the developed animated module is the mathematics textbook for the third grade, authored by Prof. Dr. Vladimira Angelova and Zhana Koleva, "Prosveta plus" publishing house, Sofia, 2017. An animated Scratch module is presented for acquiring and practicing competences in the subject for “Adding and subtracting numbers up to 1000 without crossing over. The game can be used as part of a lesson for new knowledge, for exercise, as well as for independent work.

4. **Radev V.**, Consolidation of the acquired knowledge on the recognition of the geometric figure triangle with the help of information technologies. In: Pedagogy, Sofia, NION "Az-buki", 2023 , ISSN 1314–8540 (Online) , ISSN 0861–3982 (Print) , <https://doi.org/10.53656/ped2023-4s.10>



The article is devoted to the use of information technologies in the creation of educational games for the acquisition of new knowledge in primary school. Specialized Scratch software for introducing children to computer culture is reviewed. The basis for the developed animated modules is the mathematics textbook for the third grade, authored by Prof. Dr. Vladimira Angelova and Zhana Koleva, "Prosveta plus" publishing house, Sofia, 2017. The main goal of this article is to develop it on Scratch, experiment and determined the effectiveness of a software package of an animated module based on the mathematics curriculum in third grade and to compare the learning outcomes achieved in a class in

which the animated tasks were implemented and one in which they were not implemented.

5. **Radev V.**, Creation of supporting materials for teaching mathematics in second grade., *E-magazine "Education and Development" of the Department for Qualification and Professional Development of Pedagogical Specialists at PU* , 2023, ISSN 2603-3577 <http://www.eddev.eu/#Izllzdanija/734C2EC61F1F-06C4-39ED-45D5D64A2A64>



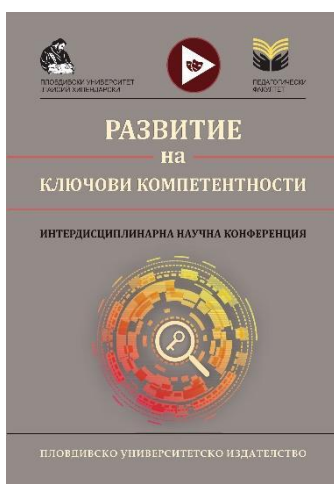
The work proposes the development of learning content such as animated scenarios for teaching the topic "Table multiplication and division". The capabilities of Scratch to create visual animated examples and tasks in an electronic environment of situations close to everyday life, through which to present the learning content in mathematics classes, are presented. The content presented in this way offers the opportunity to integrate interactive activities in a smooth and natural way. The purpose of the publication is to present the development of animated scenarios for teaching the discussed topic in one with its teaching method.

6. **Radev V.** , Application of Scratch in kindergarten, Yearbook of PU "P. Hilendarski" - Faculty of Education, 2022, pp. 137-144, ISSN 2815-4134



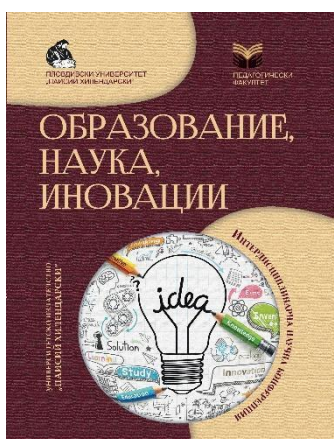
The article is devoted to the use of Scratch in creating educational games for acquiring new knowledge in Kindergarten. Specialized Scratch software was used to introduce children to computer culture. The relationship between information and communication is shown key creation technologies competences . An animated module preparing children to face the challenges was launched on the digital ones methods on training .

7. **Radev V.**, SCRATCH and its application in mathematics classes, *Collection of reports from the interdisciplinary scientific conference "Development of key competences"*, 2021, pp. 154-161, ISBN 978-619-202-599-1



The article is devoted to the use of SCRATCH in second grade mathematics education. A game model is presented giving a visual idea of the numbers on the number line . The purpose of the article is to provoke curiosity and interest, to promote students' research skills, activating their thinking activity and giving the opportunity to develop their creativity. The learning content presented in this way offers the possibility of integrating interactive activities in a smooth and natural way.

- 8. Radev V.** , Application of information technologies in primary school education . *Collection reports from interdisciplinary scientific " Education , Science , Innovation " conference* , 2020, p . 154-161, ISBN 978-619-202-599-1



The article is devoted to the use of ICT in creating educational games for acquiring new knowledge in primary school. Specialized software is examined and the introduction of children to the computer culture, which is an essential part of the modern technical culture of man, is presented . Areas of competence in studying Computer Modeling in the field of Algorithms are reviewed and learning outcomes are shown.

- 9. Radev V.** , Electronic education through electronic textbooks, *E-magazine "Education and Development" of the Department for Qualification and Professional Development of Pedagogical Specialists at the PU* , 2019, pp. 50-57, ISSN 2603-3577



The article presents the use of electronic textbooks during student education. Emphasis is placed on their preparation and the organization of the lesson and the learning process. The similarities and differences between the e-textbook and paper ones are discussed.

- 10. Radev V.**, Teaching the virtual classroom, *E-magazine "Education and Development" of the Department for Qualification and Professional Development of Pedagogical Specialists at the PU* , 2019, pp. 58-63, ISSN 2603-3577

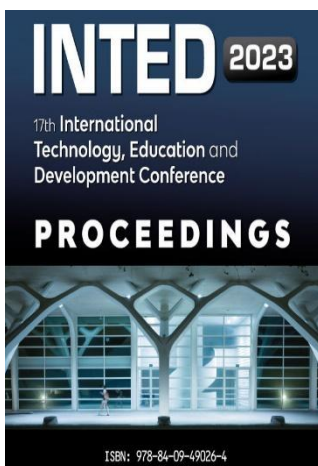


The article is devoted to learning through the virtual classroom, conferencing technologies for connection and control exercised over learning are discussed. The advantages of online meetings in e-learning are shown .

SCIENTIFIC ARTICLES IN A FOREIGN LANGUAGE

11. Radev V., Vazova T., IMPROVING KEY COMPETENCES IN THE USE OF INFORMATION TECHNOLOGY , *17th International Technology, Education and Development Conference , Online Conference* , 6-8 March, 2023 , 2463-2470 , ISBN: 978-84-09-49026 -4, ISSN:2340-1079

- **Radev V., Vazova T.,** Consolidation of key competencies when using information technologies

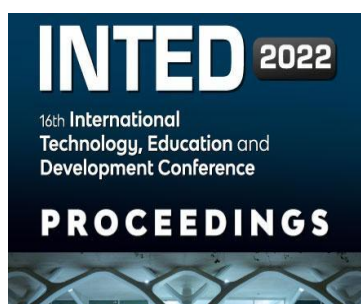


The main goal of this article is the development of digital literacy and the use of information technology by social workers to work with text documents in an electronic environment. A course for their training is presented and the main hypothesis of the research is proven, that the proposed methodological tools for applying information technologies for strengthening on the skills for computer word processing would contributed for more efficient mastery on the main ones knowledge , skills and attitudes related to digital literacy and the modern social worker. In this way, they

will improve the level of services offered, and users will receive a better service.

12. Radev V., The implementation of the Scratch application for improving the division skill in mathematics classes in the second grade of primary school , *16th International Technology, Education and Development Conference, Online Conference, 7-8 March, 2022* , 4794-4803, ISBN: 978-84-09-37758-9, ISSN : 2340-1079

- **Radev V.,** Application of SCRATCH to reinforce the skill of division in mathematics classes in the second grade of primary school



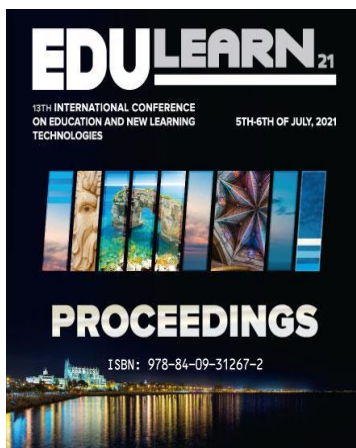
The present article is devoted to the application of Scratch to strengthen the division skill in second grade elementary school students in teaching

mathematics. The animated module of the game "Divide Equally" is based on the mathematics textbook for the second grade, authored by Prof. Dr. Vladimira Angelova and Stella Doichinova, "Prosveta plus" publishing house, Sofia, 2017.

To realize the planned effect of using Scratch, an animated module was developed after the educational content on the subject formed the concept of division action. Practical exercises were done in which a given set of objects is divided into sets of equal power. This operation illustrates the operation of division. With it, the student has learned to determine the number of elements in each of the sets (division into equal parts) or the number of equally powerful sets (division by content). All of them are accompanied by illustrations in the textbook, which help to understand the meaning of the division operation. Therefore, the proposed game "Split Equally" comes as a natural conclusion to the theme, offering elements of knowledge application, reinforcement, fun and entertaining element, interactivity, all programmed in a fun and entertaining interface. A total of ten credits are awarded for the entire game until a correct answer is reached in all four scenes.

13. Radev V. , , Design of educational computer game in second grade mathematics with help of scratch , *13th International Conference on Education and New Learning Technologies, Online Conference, 5-6 July, 2021*, 939-948, ISBN: 978-84-09-31267-2, ISSN : 2340-1117

- **Radev V.**, Designing an educational computer game in mathematics for the second grade of primary school using Scratch



This article details the application of Scratch in teaching second grade mathematics. The basis for the developed animated modules is the mathematics textbook for the second grade, authored by Prof. Dr. Vladimira Angelova and Stella Doichinova, Prosveta Plus Publishing House, Sofia, 2017. The mathematics curriculum is presented in an interesting and entertaining way, with a lot of color illustrations, under the slogan "The Great Adventure". The content presented in this way offers the opportunity to integrate interactive activities in a smooth and natural way.

An animated module with developed examples of Scratch is presented, taking into account the age-related psychological capabilities of second graders, covering key topics in the textbook, but the plot and

topics differ, in order to achieve originality, respectively - to achieve the intended effect. The mathematics modules developed and proposed in this paper are different in form and complexity and are structured as games, since most students are attracted to computer games. The programming of Scratch is done using commands that are visualized in the environment as *building blocks* . Blocks are divided into groups and have different color identification - movement commands, appearance commands, control commands. With a dynamic course and a different interface of the modules, the aim is to consolidate the learning content, to develop memory, logical thinking, attention and concentration, and the mutual relationship between the variety of tasks would help to form knowledge and skills in a system .

14.Radev V., Creating educational games for mathematics classes using information technology, International Scientific Conference IMEA, 23-25 November 2022, 297-304, ISBN 978-619-7663-33-4

- **Radev V.**, Creating educational games for mathematics classes with the help of information technologies



The article is devoted to the use of information technologies in the creation of educational games for the acquisition of new knowledge in primary school. Specialized Scratch software for introducing children to computer culture is reviewed. The basis for the developed animated module is the mathematics textbook for the third grade, authored by Prof. Dr. Vladimira Angelova and Zhana Koleva, "Prosveta plus" publishing house, Sofia, 2017 . The article is aimed at strengthening the competences acquired by the student on the topic "Subtraction of numbers up to 1000 with transition" to perform the arithmetic operation of subtracting numbers up to 1000 with transition from the order of hundreds to the

order of tens, to check the subtraction with addition and to finds an unknown collectable.

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