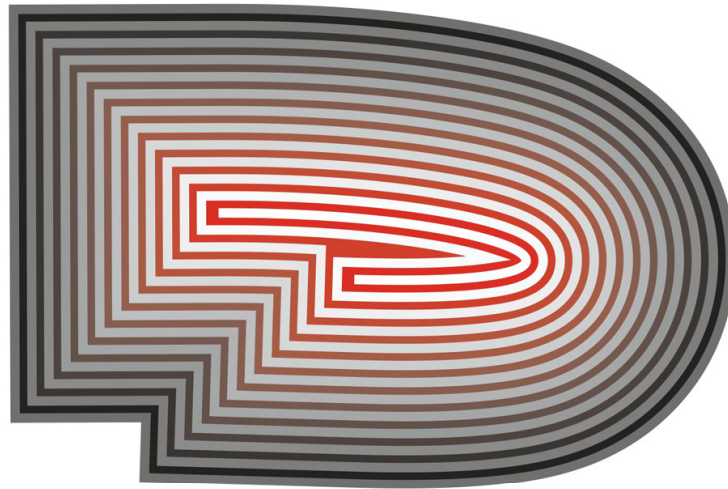


VOLUME 50, 2012



PROBLEMS
OF EDUCATION
IN • THE 21st
CENTURY



**INFORMATION
& COMMUNICATION
TECHNOLOGY
IN NATURAL SCIENCE
EDUCATION – 2012**

ISSN 1822-7864



9 771822 786007

INFORMATION & COMMUNICATION TECHNOLOGY IN NATURAL SCIENCE EDUCATION – 2012

Scientific Methodical Center „Scientia Educologica“, Lithuania,
The Associated Member of Lithuanian Scientific Society, European Society for the History of Science (ESHS) and ICASE (International Council of Associations for Science Education)

The articles appearing in this scientific collection are indexed and abstracted in EBSCO: Education Research Complete (<http://search.ebscohost.com>), Copernicus Index (<http://www.indexcopernicus.com>), the Asian Education Index (http://www.asian-education-index.com/education_journals_index_P.php), SOCOLAR, China Educational Publications Import & Export Corporation (<http://www.socolar.com/?ver=en>), Cabell Publishing, Inc., Directories of Academic Journals (<http://www.cabells.com/index.aspx>), Contemporary Science Association/AAP databases (<http://www.contemporaryscienceassociation.net/journal/view/1190>), and list of Science Education Journals (<http://homepages.wmich.edu/~rudged/journals.html>), WebQualis (<http://qualis.capes.gov.br/webqualis/>)

Publisher

Scientific Methodical Center „Scientia Educologica“, Lithuania, the Associated Member of Lithuanian Scientific Society, the Association of Lithuanian Serials, European Society for the History of Science (ESHS) and International Council of Associations for Science Education (ICASE)

Editor-in-Chief

Prof.dr. **Vincentas Lamanauskas**, Scientific Methodical Centre „Scientia Educologica“, Republic of Lithuania

Editorial Board

- Dr., Prof. **Boris Aberšek**, University of Maribor, Slovenia
Dr. **Saleh A. Alabdulkareem**, King Saud University, Saudi Arabia
Dr., Prof. **Agnaldo Arroio**, University of São Paulo, Brazil
Dr., Prof. **Martin Bilek**, Hradec Kralove University, Czechia
Dr., Prof. **Andris Broks**, University of Latvia, Latvia
Dr. **Paolo Bussotti**, Commission for the Publication of the National Edition of Federigo Enriques's Works, Italy
Dr. **Muammer Calik**, Karadeniz Technical University, Turkey
Dr., Prof. **Janis Gedrovics**, Riga Teacher Training and Educational Management Academy, Latvia
Dr., **Harun Yilmaz**, Scientific and Technological Research Council of Turkey, Turkey
Dr., **Angela James**, University of Kwazulu – Natal, South Africa
Dr., Prof. **Vladimir S. Karapetyan**, Armenian State Pedagogical University named after Kh. Abovyan, Armenia
Dr. **Kuo-Hung Huang**, National Chiayi University, Taiwan
Dr., Prof. **Mirosław Kowalski**, University of Zielona Gora, Poland
Dr. **Milan Kubiato**, Masaryk University, Czech Republic
Dr. **Todar T. Lakhvich**, Belarusian State M. Tank Pedagogical University, Republic of Belarus
Dr. **Eleonora Melnik**, Karelian State Pedagogical University, Republic of Karelia, Russia
Dr., Prof. **Danuše Nezvalova**, Palacky University, Czechia
Dr., Prof. **Yuriy Pelekh**, International University of Economics and Humanities named after Academician Stepan Demianchuk, Ukraine
Dr., **Raffaele Pisano**, Cirphles École Normale Supérieure, France
Dr. **Uladzimir K. Slabin**, University of Oregon, USA
Dr. **Laima Railienė**, Scientific Methodical Centre „Scientia Educologica“, Republic of Lithuania
Dr., Prof. **Borislav V. Toshev**, Sofia University, Bulgaria
Dr., Prof. **Milan Turčani**, Constantine the Philosopher University, Slovakia
Dr., Prof. **Nicos Valanides**, University of Cyprus, Cyprus

*Copyright of this volume entitled **Information & Communication Technology in Natural Science Education – 2012** is the property of Scientific Methodical Centre “Scientia Educologica”, Lithuania. All rights reserved. No part of this volume may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the copyright holders.*

Problems of Education in the 21st Century is an international, periodical, peer reviewed scientific journal, issued by the SMC „Scientia Educologica“ in Cooperation with Scientia Socialis.

Address: Scientific Methodical Centre “Scientia Educologica”

Donelaičio Street 29, LT-78115 Siauliai, Lithuania

E-mail: problemsofeducation@gmail.com

Phone: +370 687 95668

WEB page: <http://www.gu.puslapiiai.lt>; http://www.jbse.webinfo.lt/Problems_of_Education.htm

ISSN 1822-7864

© SMC „Scientia Educologica“, Lithuania, 2012