
CBU International Conference on Innovations in Science and Education 2020
Book of Abstracts

Editors:

Petr Hájek, Ondřej Vít

18-20 March 2020

Prague, Czech Republic

Sponsored by (financially supported by):

CBU Research Institute

CBU Research Institute s.r.o., Prague, Czech Republic

ISE Research Institute

ISE Research Institute s.r.o., Prague, Czech Republic

Unicorn University

Unicorn University s.r.o., Prague, Czech Republic

Publisher

CBU Research Institute s.r.o.

Jáchymova 27/4,

110 00 Praha 1

Czech Republic

Published

November 16, 2020

Conference: CBU International Conference on Innovations in Science and Education 2020,
Book series: Book of Abstracts, Vol 1, 2020
www.cbuic.cz

Citation guidelines

As this is a serial book published annually, it has both ISSN and ISBN. ISSN links to the whole series of proceedings based on CBU International Conferences, while ISBN links to this specific issue in 2020. Each article also has its own unique permanent DOI link (number) located on the first article page. A digital object identifier (DOI) is a unique alphanumeric string to identify content and provide a persistent link to its location on the internet. All DOI numbers begin with a 10 and contain a prefix and a suffix separated by a slash. The prefix is the number of four or more digits assigned to organizations; the publisher assigns the suffix. DOI should be cited in the form of a full HTTPS link that includes <http://dx.doi.org/>. All articles were peer-reviewed.

Please use the following format to cite online articles (APA citation format):

Author, A. (2020). TITLE OF PAPER. *Proceedings of CBU in Economics and Business, 1, pp-pp.*
<https://doi.org/10.12955/xxxx> (update the XXXX DOI number to match the article)

For citing from this book of Abstracts please use:

Author, A. (2020). TITLE OF PAPER. *CBU International Conference on Innovations in Science and Education 2020 Book of Abstracts, 1, pp.* E-ISBN 978-80-908061-1-5

ISBN 978-80-908061-1-5 (Online)

International Conference Website

www.cbuic.cz (www.iseic.cz)

Publication of records for individual papers is online at ojs.cbuic.cz. This website is used to distribute the articles into various databases. For citing online articles, please use E-ISSN (Online ISSN) or preferably DOI. Previous volumes of this conference proceedings are archived at www.journals.cz (Volumes 2013 – 2019 were published with online ISSN 1805-9961). In 2020 the conference proceedings are published separately for each section while the new ISSNs are registered with the ISSN agency as direct followers of the old ISSN.

Copyright information

Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a Creative Commons Attribution License 4.0 (CC BY 4.0) that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.

Authors can enter into separate, additional contractual arrangements for the non-exclusive distribution of the journal's published version of the work (e.g., post it to an institutional repository or publish it in a book), with an acknowledgment of its initial publication in this journal.

Authors are permitted and encouraged to post their work online (e.g., in institutional repositories or on their website) before and during the submission process, as it can lead to productive exchanges and earlier and greater citation of published work.

Introduction

We had the great honor of organizing the CBU International Conference on Innovations in Science and Education 2020 in Prague, Czech Republic. The event was affected by the coronavirus pandemic as every other aspect of life in 2020 worldwide. Since 2013 the conference became an important international event in a cross-industry discussion about innovations in Education and Science.

CBUIC 2020 was organized by the CBU Research Institute, Unicorn University (which renamed itself from Unicorn College in 2020), and ISE Research Institute, all three located in Prague, Czech Republic. The CBU Research Institute published the proceedings.

Three cooperating organizations supported the three-day conference. The participation was lower due to the coronavirus pandemic as follows: 23 papers in the Economics and Business section, 49 papers in the Social Sciences section, 20 papers in the Medicine and Pharmacy section, and 14 papers in the Natural Sciences and ICT section.

As every year, the purpose of CBUIC 2020 was to provide a forum for the participants to report and review innovative ideas with up-to-date progress and developments, discuss novel approaches to the application in their research areas and discuss challenges of doing science and education.

We sincerely hope that exchanging ideas on doing research, science, and improving education will help the participants, and international cooperation sharing the common interest will be enhanced.

On behalf of the Organization Committee of CBUIC 2020, we would like to heartily thank our cooperating organizations for all they have done for the conference. We would also like to thank the authors for their contribution to the proceedings; the participants and friends of CBUIC 2020, for their interest and efforts in helping us to make the conference possible; and the Editorial boards for their effective work and valuable advice, especially the CBUIC 2020 secretariat and the CBU RI staff, for their tireless efforts and outstanding services in preparing the conference and publishing the Proceedings.

Petr Hájek, CBU Research Institute
David Hartman, Unicorn University
Conference chairs

Contents

Citation guidelines.....	ii
Copyright information.....	ii
Introduction.....	iii
Contents.....	iv
Conference chairs.....	v
Editors.....	v
Economics and Business Section Committee.....	v
Social Sciences Section Committee.....	vi
Medicine and Pharmacy Section Committee.....	vii
Natural Sciences and ICT Section Committee.....	viii
Section 1: Economics and Business.....	1
Section 2: Social Sciences.....	25
Section 3: Medicine and Pharmacy.....	75
Section 4: Natural Sciences and ICT.....	97

Conference chairs

Petr Hajek, CBU Research Institute, Unicorn University, Prague, Czech Republic
David Hartman, Unicorn University, Academy of Sciences of the Czech Republic, Charles University in Prague, Czech Republic

Editors

Dr. Petr Hajek, Director, CBU Research Institute, Prague, Czech Republic
Dr. Ondřej Vít, First Faculty of Medicine, Charles University, Czech Republic

Economics and Business Section Committee

1. Prof. Thurasamy Ramayah, Universiti Sains, Malaysia
2. Assoc. Prof. Mustafa Cagatay Korkmaz, Artvin Çoruh University, Turkey
3. Dr. Katarzyna Marek-Kolodziej, Opole University of Technology, Faculty of Production Engineering and Logistics, Poland
4. Prof. Milen Ivanov Baltov, Burgas Free University, Bulgaria
5. Dr. Maria Johann, Warsaw School of Economics, Poland
6. Dr. Anna Lemańska-Majdzik, Czestochowa University of Technology, Faculty of Management, Poland
7. Assoc. Prof. Soner Gokten, Baskent University, Turkey
8. Dr. Enes Emre Başar, Bayburt University, Turkey
9. Assoc. Prof. Maria Eneva Bakalova, University of National and World Economy, Faculty of International Economy and Politics, Bulgaria
10. Professor Ionel Bostan, Ștefan cel Mare University of Suceava, Romania
11. Prof. Goran R. Milovanovic, Faculty of Economics, University of Nis, Serbia
12. Assoc. Prof. Mária Bohdalová, Comenius University in Bratislava, Faculty of Management, Slovakia
13. Assoc. Prof. Tomáš Pavelka, Faculty of Business Administration, University of Economics in Prague, Czech Republic
14. Assoc. Prof. Błażej Prusak, Gdańsk University of Technology, Faculty of Management and Economics, Poland
15. Dr. Marija Risto Magdinceva-Sopova, University Goce Delcev –Stip, Faculty of Tourism and business logistic – Gevgelija, Macedonia
16. Prof. Petr Marek, Department of Finance and Business Valuation, Executive board member of Acta Oeconomica Pragensia, University of Economics in Prague, Czech Republic
17. Assoc. Prof. Kudret GUL, Tourism and Hotel Management Department, Balikesir Vocational School, Balikesir University, Turkey
18. Prof. Irfan Ridwan Maksum, University of Indonesia, Malaysia
19. Prof. Carmen Balan, The Bucharest University of Economic Studies, Romania
20. Prof. Yesim Kustepeli, Dokuz Eylul University, Faculty Of Business, Turkey
21. Dr. Borut Vrščaj, Agricultural Institute of Slovenia, Department for Agroecology and Natural Resources, Slovenia
22. Prof. Carmen-Aida Hutu, “Gheorghe Asachi” Technical University of Iasi, Romania
23. Dr. Milan Čupić, University of Kragujevac, Faculty of Economics, Serbia
24. Dr. Małgorzata Okręglika, Czestochowa University of Technology, Poland
25. Dr. Marcel Kordoš, Alexander Dubček University in Trenčín, Slovakia
26. Assoc. Prof. Eglantina Hysa, Economics Department, Epoka University, Albania
27. Dr. Hulya Kaftelen Odabasi, Firat University, School of Civil Aviation, Turkey

28. Assoc. Prof. Venelin Nikolaev Boshnakov, University of National and World Economy, Bulgaria
29. Prof. Matilda Ivanova Alexandrova, University of National and World Economy – Sofia, Bulgaria
30. Assoc. Prof. Jasmina Starc, Higher Education Centre, Faculty of Business and Management Sciences, Slovenia
31. Murat Kantar, Pamukkale University, Turkey
32. Dr. Mirjana Todorović, University of Kragujevac, Faculty of Economics, Serbia
33. Dr. Belem Barbosa, University of Aveiro, Portugal
34. Dr. Teguh Kurniawan, Faculty of Administrative Science, Universitas Indonesia, Indonesia
35. Dr. Jolanta Wartini-Twardowska, University of Economics in Katowice, Poland
36. Dr. Petr Hajek, Central Bohemia University and Unicorn University, Prague, Czech Republic
37. Dr. Sherzod Tashpulatov, Czech technical university in Prague, Czech Republic
38. Dr. Michal Brožka, Unicorn University, Prague, Czech Republic
39. Dr. Jan Vorlíček, Unicorn University, and College of information Management and Business Administration, Prague, Czech Republic
40. Jerome Dumetz, Unicorn University, Prague, Czech Republic
41. Prof. Drahomír Jančík, Institute of Economic and Social History, Faculty of Arts, Charles University, Prague and Faculty of Business Administration, University of Economics in Prague, Czech Republic
42. Assoc. Prof. Aneta Kucińska-Landwójtowicz, Opole University of Technology, Poland
43. Dr. Kholnazar Amonov, European Institute of Applied Science and Management, Prague, Czech Republic
44. Assoc. Prof. Murtaz Kvirkvaia, Dean of the Faculty School of Business and Management, Grigol Robakidze University, Georgia
45. Dr. Quang Van Tran, Faculty of Finance and Accounting, University of Economics in Prague, Czech Republic
46. Dr. Rohit Bansal, Vaish College of Engineering, Rohtak, India
47. Assoc. Prof. Ermira Hoxha Kalaj, “Luigj Gurakuqi” University, Albania
48. Assoc. Prof. Mohammed Tountou, University of Algiers, Algeria
49. Assoc. Prof. Elena Stavrova, SWU “Neofit Rilski”-Blagoevgrad, Bulgaria

Social Sciences Section Committee

50. Dr. Dali Osepashvili, International Black Sea University, Georgia
51. Dr. Katarína Kohútová, Catholic University in Ruzomberok, Slovakia
52. Prof. Shahla Sorkhabi, Payame Noor University, Iran
53. Prof. Mehmet Zülfü Yıldız, Adiyaman University, Turkey
54. Assoc. Prof. Mihai Gligor, 1 Decembrie 1918 University of Alba Iulia, Romania
55. Assoc. Prof. Seyed Mohammad Kalantarkousheh, Allamah Tabataba'i University, Iran
56. Prof. Stanislava Yordanova Stoyanova, South-West University “Neofit Rilski”, Bulgaria
57. Assoc. Prof. Aleksandra Maria Rogowska, University of Opole, Poland
58. Assoc. Prof. Radka Ivanova Massaldjieva, Medical University in Plovdiv, Faculty of Public Health, Bulgaria
59. Assoc. Prof. Lehte Roots, Tallinn University of Technology, Tallinn Law School, Estonia
60. Dr. Eriada Cela, Aleksander Xhuvani University, Albania
61. Assoc. Prof. Savaş Zafer Şahin, Atilim University, Turkey

62. Assoc. Prof. Peter Jusko, Matej Bel University in Banska Bystrica, Faculty of Education, Slovakia
63. Assoc. Prof. Michal Kozubík, Constantine the Philosopher University in Nitra, Faculty of Social Sciences and Health Care, Dept. of Social Work and Social Sciences, Slovakia
64. Dr. Jana Kliestikova, University of Zilina, The Faculty of Operation and Economics of Transport and Communications, Department of Economics, Slovakia
65. Assoc. Prof. Cihat Yaşaroğlu, Bingöl University, Turkey
66. Dr. Alma Karasaliu, Fan S. Noli University, Faculty of Education and Phylology, Albania
67. Assoc. Prof. Amani Hamdan, Imam Abdulrahman University, Saudi Arabia
68. Dr. Taher Afsharnezhad, Shomal University, Iran
69. Dr. Pavel Král, Faculty of Management, University of Economics in Prague, Czech Republic
70. Prof. Nino Kemertelidze, Vice-rector of Grigol Robakidze University (Heading Scientific Research Management Centre and Center of International Integration), Tbilisi, Georgia
71. Prof. Eduard Kubů, Faculty of Arts, Charles University AND University of Economics in Prague AND Unicorn University, Prague, Czech Republic
72. Dr. Andrius Puksas, Mykolas Romeris University, Lithuania
73. Assoc. Prof. Giedrė Valūnaitė-Oleškevičienė, Mykolas Romeris University, Lithuania
74. Anna Karłyk-Ćwik, Faculty of Education, University of Lower Silesia in Wrocław, Poland
75. Venelin Terziev, Vasil Levski National Military University, Veliko Turnovo, Bulgaria
76. Arta Musaraj, Founder and Editor in Chief, "Academicus" – International Scientific Journal, Albania
77. Assoc. Prof. Libor Klimek, Criminology and Criminalistics Research Centre director, Matej Bel University, Slovakia and Chair of European Law, Faculty of Law, Leipzig University, Germany

Medicine and Pharmacy Section Committee

78. Fatjona Kamberi, University of Vlore "Ismail Qemali", Vlore, Albania
79. Helena Paszeková, First Faculty of Medicine, Charles University, Czech Republic
80. Dr. Petra Bašová, First Faculty of Medicine, Charles University, Czech Republic
81. Matyáš Krijt, First Faculty of Medicine, Charles University, Czech Republic
82. Dr. Ondřej Vít, First Faculty of Medicine, Charles University, Czech Republic
83. Olga Součková, First Faculty of Medicine, Charles University, Czech Republic
84. Prof. Martin Rusnak, Department of Public Health, Trnava University, Slovakia
85. Prof. Igor Jerkovic, Faculty of Chemistry and Technology, University of Split, Croatia
86. Dr. Hakan Çelebi, Aksaray University Department of Environmental Engineering, Turkey
87. Prof. Naim Deniz Ayaz, Kırıkkale University Faculty of Veterinary Medicine Department of Food Hygiene and Technology, Turkey
88. Assoc. Prof. Rostam Jalali, Kermanshah University of Medical Sciences, Iran
89. Dr. Valentina Gineviciene, Department of Human and Medical Genetics Faculty of Medicine, Biomedical science institute, Vilnius University, Lithuania
90. Dr. Cumali Keskin, Mardin Artuklu University, School of Health, Turkey
91. Prof. Arfan Yousaf, Pir Mehr Ali Shah Arid Agriculture University, Faculty of Veterinary and Animal Sciences, Rávalpindí, Pakistan
92. Assoc. Prof. Lorena Dima, Transilvania University of Brasov, Faculty of Medicine, Romania
93. Prof. Zeliha Selamoglu, Nigde Ömer Halisdemir University, Faculty of Medicine, Turkey

94. Dr. Surena Nazarbaghi, URMIA University of Medical Sciences, Azerbaijan
95. Dr. Onur Aydoğdu, Marmara University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Turkey
96. Dr. Seda Genc, Yasar University, Turkey
97. Assoc. Prof. Nevenka Velickova, Faculty of medical sciences, University Goce Delcev – Stip, Macedonia
98. Dr. Gulcan Bakan, Pamukkale University, Faculty of Health Sciences, Internal Medicine, Turkey
99. Dr. Elouaer Mohamed Aymen, High Institute of Agronomy, Chott Mariem, Tunisia
100. Assoc. Prof. Florentina Matei, University of Agronomic Sciences and Veterinary Medicine Bucharest, Faculty of Biotechnologies, Romania
101. Dr. Jana Staňurová, Universitats Klinikum Essen und Medizinische Fakultät, Institute of Human Genetics, Essen, Germany
102. Assoc. Prof. Izzet Yavuz, Faculty of Dentistry, University of Dicle in Diyarbakir, Turkey
103. Dr. Eva Tůmová, First Faculty of Medicine, Charles University, and General University Hospital in Prague, Czech Republic
104. Prof. Liana Gogiashvili, Head of the Experimental Pathology Department, A. Natishvili Morphology Institute, Tbilisi, Georgia
105. Assoc. Prof. Ekaterine Chkhartishvili, Tbilisi State Medical University, Chachava Clinic, Tbilisi, Georgia, Georgia
106. Dr. Eliška Potluková, Universitatsspital Basel, Department of Internal Medicine, Basel, Switzerland
107. Assoc. Prof. Dr. Sezer Okay, Hacettepe University Vaccine Institute, Ankara, Turkey
108. Assoc. Prof. Oana Cristina Arghir, School of Medicine, Ovidius University of Constanta, Romania
109. Assoc. Prof. Marina Oțelea, University of Medicine and Pharmacy, Bucharest, Romania

Natural Sciences and ICT Section Committee

110. Prof. Dominika Kuśnierz-Krupa, Cracow University of Technology, Faculty of Architecture, Poland
111. Prof. Antoniya Stoyanova, Trakia University, Stara Zagora, Bulgaria
112. Assoc. Prof. Salim Cerci, Adiyaman University, Turkey and CERN
113. Assoc. Prof. Deniz Sunar Cerci, Adiyaman University, Turkey and CERN
114. Dr. Tatjana Spahiu, Polytechnic University of Tirana, Albania
115. Dr. Oğuz Kağan Köksal, Karadeniz Technical University, Turkey
116. Prof. Dijana Blazhekovikj – Dimovska, University “St. Kliment Ohridski” – Bitola, Macedonia
117. Blagoj Ristevski, St. Kliment Ohridski University, Bitola, Macedonia
118. Maxim Usatov, Founder and CTO @ BusinessCom Networks, USA
119. Emine Ergun, Baskent University, Turkey
120. Assoc. Prof. Barış Sevim, Yildiz Technical University, Turkey
121. Prof. Radu-Emil Precup, Politehnica University of Timisoara, Romania
122. Dr. Ali Özer, Cumhuriyet University, Dept. of Metallurgical and Materials Engineering, Turkey
123. Assoc. Prof. Vasilija Sarac, Faculty of Electrical Engineering, University Goce Delcev, Macedonia
124. Dr. Ilknur Ucak, Nigde Omer Halisdemir University, Faculty of Agricultural Sciences and Technologies, Turkey

125. Dr. Nadezhda Traycheva Petkova, University of Food Technologies, Technological Faculty, Bulgaria
126. Dr. Korhan Cengiz, Trakya University, Turkey
127. Dr. Cornel-Liviu Tugulan, Horia Hulubei National Institute for Physics and Nuclear Engineering, IFIN-HH, Romania
128. Prof. Srinivasulu Tadisetty, Kakatiya University, India
129. Prof. Bahattin Akdemir, Namik Kemal University Faculty of Agriculture Department of Biosystems Engineering, Turkey
130. Dr. Petru Papazian, "Politehnica" University of Timisoara, Romania
131. Assoc. Prof. Svetla Dimitrova Stoilova, Technical University-Sofia, Bulgaria
132. Assoc. Prof. Desislava Ivanova Paneva-Marinova, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria
133. Dr. Hasan Öz, Suleyman Demirel University, Agriculture Faculty, Turkey
134. Prof. Murat Kunelbayev, Kazakh State Women's Teacher Training University, Kazakhstan
135. Assoc. Prof. Kemal Baris, Bulent Ecevit University, Turkey
136. Assoc. Prof. Ahmad Fakharian, Faculty of Electrical, Biomedical and Mechatronics Engineering, Qazvin Branch, Islamic Azad University, Iran
137. Dr. Rajshree B. Jotania, Gujarat University, Ahmedabad, India
138. Assoc. Prof. Murat Kurudirek, Ataturk University, Faculty of Science, Department of Physics, Turkey
139. Prof. Victor Iliev Rizov, University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria
140. Prof. Harun Kemal Ozturk, Pamukkale University, Turkey
141. Dr. Mihail-Razvan Ioan, Horia Hulubei National Institute for Research and Development in Physics and Nuclear Engineering (IFIN-HH), Romania
142. Dr. Mahdi Salimi, Islamic Azad University, Iran
143. Prof. Mehmet Odabaşı, Aksaray University, Faculty of Arts and Science, Chemistry Department, Biochemistry Div., Turkey
144. Assoc. Prof. Valentin Mateev, Technical University of Sofia, Electrical Engineering Faculty, Bulgaria
145. Dr. Mircea Constantin Pentia, National Institute for Physics and Nuclear Engineering – Horia Hulubei, Romania
146. Dr. Ionut Ovidiu Toma, The "Gheorghe Asachi" Technical University of Iasi, Romania
147. Assoc. Prof. Cem Tokatlı, Trakya University, Turkey
148. Dr. Rhyme Kagiso Setshedi, Saudi Electric Services Polytechnic, Saudi Arabia
149. Dr. Ozge Erken, Adiyaman University, Turkey
150. Dr. Mutlu Akar, Yildiz Technical University, Turkey
151. Assoc. Prof. Katarzyna Hys, Opole University of Technology, Poland
152. Sana Malik, University of Management and Technology, Pakistan
153. Ozge Suzer, Bilkent University, Turkey
154. Muhammad Kamran Khan, Department of Computer Science & IT, Sarhad University of Science and Information Technology, Peshawar, Pakistan
155. Assoc. Prof. İpek Güler, Çankaya University, Turkey
156. Dr. Erdal Erdal, Kirikkale University, Turkey
157. Prof. Renaldas Raisutis, Kaunas University of Technology, Lithuania
158. Dr. Asim Mantarcı, Mus Alparslan University, Turkey
159. Dr. Ceren Türkcan Kayhan, Izmir University of Economics, Vocational School of Healthy Services Medical, Turkey
160. Dr. Ivo Yordanov Damyanov, South-West University, Blagoevgrad, Bulgaria

161. Dr. Serap Akdemir, Namik Kemal University, Technical Sciences School, Turkey
162. Hande Sezgin, Istanbul Technical University, Turkey
163. Dr. Reşit Çelik, Yıldız Technical University, Turkey
164. Assoc. Prof. Cihan Çetinkaya, Adana Alparslan Türkeş Science and Technology University, Turkey
165. Assoc. Prof. Saniye Karaman Öztaş, Gebze Technical University, Turkey
166. Prof. Onder Erkarşlan, Izmir Institute of Technology, Turkey
167. Dr. Hakan Butuner, Istanbul Aydın University, IMECO – Industrial Management and Engineering Co., Turkey
168. Assoc. Prof. Vitalii Ivanov, Sumy State University, Ukraine
169. Dr. Viktor Goliáš, Institute of geochemistry, mineralogy and mineral resources, Faculty of Science, Charles University in Prague, Czech Republic
170. Dr. Michal Kőkörčený, Unicorn University, Prague, Czech Republic
171. Dr. Yılmaz Uyaroğlu, Electrical & Electronics Engineering Department, Engineering Faculty, Sakarya University, Sakarya, Turkey
172. Dr. Ahmet Çifci, Electrical and Energy Department, Burdur Mehmet Akif Ersoy University, Burdur, Turkey
173. Dr. Uğur Erkin Kocamaz, Computer Technologies Department, Uludağ University, Karacabey, Turkey
174. Dr. David Hartman, Head of IT department, Unicorn University, Prague, AND Institute of Computer Science, Academy of Science of the Czech Republic, AND Department of Applied Mathematics, Charles University, Prague, Czech Republic
175. Dr. Petr Bitala, Department of Fire Protection, Faculty of Safety Engineering, VŠB-Technical University of Ostrava, Czech Republic
176. Dr. Barbora Baudišová, Laboratory for Risk Research and Management, Faculty of Safety Engineering, AND Energy research center, VŠB-Technical University of Ostrava, Czech Republic
177. Dr. Jan Kamenický, Institute of Mechatronics and Computer Engineering, Faculty of Mechatronics, Informatics and Interdisciplinary studies, Liberec Technical University, Czech Republic, Czech Republic
178. Dr. Václav Nevrlý, Institute of Thermomechanics, Academy of Sciences of the Czech Republic; Faculty of Safety Engineering, VŠB-Technical University of Ostrava, Czech Republic
179. Prof. Natalia Kamanina, S.I. Vavilov State Optical Institute, Russia
180. Prof. Snezhana Gocheva-Ilieva, University of Plovdiv “Paisii Hilendarski”, Bulgaria
181. Dr. Mihaela Ivanova, University of Food Technologies, Bulgaria
182. Assoc. Prof. Magdalena Krystyjan, University of Agriculture in Krakow, Krakow, Poland

Section 1: Economics and Business

PERSPECTIVES AND INTEGRATION OF BICYCLE TRANSPORT IN SOFIA, BULGARIA

Borislav Arnaudov¹

Abstract: Public transport is an important element of sustainable development that incorporates responsiveness towards the need for mobility by the population within the framework of the urban transit system. As a part of the public transportation system, bicycle transport, with its environmental aspect, is the bedrock of the idea for accessible public services. This study provides core parameters for the assessment of social and environmental dimensions in order to further develop bicycle transport. It also itemizes the principles that need to be followed with the aim of social and economic sustainability. As a form of transportation in an urban environment, the bicycle traffic, its share and distribution of trips, obstacles and challenges encountered by cyclists in the city, trends and prevalent issues related to the current conditions of cycling infrastructure in Sofia, Bulgaria, were analyzed. In a nutshell, the report delivers a compiled group of suggestions on opportunities that may help to increase the functional efficiency of cycling as part of the transportation system of Sofia, in both, the social and environmental sense.

JEL Classification Numbers: O18, R41 **DOI:** <https://doi.org/10.12955/peb.v1.8>

Keywords: bicycle transport, integration, urban transit system, urban mobility and accessibility, sustainable development

¹ University of National and World Economy, Sofia, Bulgaria, Faculty “Economics of Infrastructure”, Department “Economics of Transport and Energy”, barnaudov@unwe.bg

CLUSTERS, EUROPEAN POLICY IN EXCELLENCE OF MANAGEMENT

Florina Bardea¹, Felix H. Arion², Patryk Szabelski³

Abstract: The European Union (EU) plays an important role in the developing of clusters, defined by the European Commission as groups of specialized enterprises – often SMEs – and other related supporting actors that cooperate closely together in a particular location. As a result, the EU launched the pan-European initiative to support cluster management (European Cluster Excellence Initiative). It recognizes the performance of cluster management by quality labels such as the Bronze, Silver, and Gold issued by The European Secretariat of Cluster Analysis. With reference to these certifications, the authors analyzed the cluster management excellence by critically studying the labels granted in terms of trends, numbers, sectors, countries, and regions. Based on the gathered results, the clusters initiatives (new or already existed) can benchmark themselves. Regional, national, and European policymakers will be able to estimate how specific factors of political, geographical, demographic, access to raw materials, and level of development can influence the number of clusters, their quality of management, and cluster typology. The goal of the research is to identify the number and type (bronze, silver, and gold label) of clusters in the EU and UK. As research methods, analyzes were performed using the European Cluster Collaboration Platform (ECCP) and European Secretariat for Cluster Analysis (ESCA) data. The main results of the research show that clusters differ not only in size or activity but also in quality. Most clusters are found in the rich countries of Western Europe. Most clusters in Europe that have a bronze label are often located on the Iberian Peninsula, the Balkans, and Central Europe.

JEL Classification Numbers: H5, M21, O3, **DOI:** <https://doi.org/10.12955/peb.v1.10>

Keywords: cluster, policy, quality, European Union, national legislation

¹ University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, florina.deiac@usamvcluj.ro

² University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca/AgroTransilvania Cluster, Romania, felixarion@usamvcluj.ro

³ Poznan University of Life Sciences, Poznan, Poland, szbel94@gmail.com

FLEXIBLE FORM OF EMPLOYMENT: PROSPECTS OF DEVELOPMENT

Viktor Barhatov¹, Yuner Kapkaev², Anna Isaeva³

Abstract: The need for the study is justified by the development of flexible forms of employment in the economy with new job opportunities for the international division of labor. The paper analyzed new job opportunities and risks associated with flexible form of employment for the workers, employers and the state individually as well as in relation to each other. The study investigated the future prospects of flexible forms of employment along with its impact on the economic opportunities for the enterprises and workers and conclusion has been drawn. The impact of flexible employment was also investigated on the welfare of the population and the development of national economies in the context of globalization. Three forms of flexible employment: temporal flexibility, spatial flexibility and functional flexibility have been identified to achieve the research goal.

The prospects of flexible form of employment for the enterprise and employee were assessed based on the subjective approach. The rapid assessment and empirical analysis method were used to track the population dynamics and their interest in flexible forms of employment. The results show that the increase in the share of flexible employment in the economy is justified by the increased importance of creative labor in the labor market. Flexible workers represent a diverse population group in terms of the socio-economic structure. The active development of flexible forms of employment has been considered as a manifestation of the self-regulating economy and as a form of adaptation of the population to the changing socio-economic situation. The new agile business integration can reduce the costs of hiring a full-time employee and increases employees' motivation level. The state needs to institutionalize new forms of employment in order to ensure the competitiveness of the national economy and to ensure budget revenues.

JEL Classification Numbers: Q01, E24, J21, **DOI:** <https://doi.org/10.12955/peb.v1.12>

Keywords: employment relationship, employment, flexible forms of employment, the labor market

¹ Chelyabinsk State University, Russian Federation, ieo-science@csu.ru.

² Chelyabinsk State University, Russian Federation, zam@csu.ru

³ Chelyabinsk State University, Russian Federation, isaeva@csu.ru

BULGARIA'S REAL CONVERGENCE IN THE CONTEXT OF POTENTIAL EMU MEMBERSHIP

Valentin Bilyanski¹, Silviya Kirova²

Abstract: Since the entry of Bulgaria into the European Union, the country's full membership in the Economic and Monetary Union has become one of the national economic policy goals. In the recent period Bulgaria fulfils all the nominal convergence criteria, except for the criterion on exchange rate stability as long as the country does not participate in the ERM II mechanism (although Bulgaria has a currency board arrangement in place since 1997 and the Bulgarian currency is pegged to the euro). Despite that, Bulgaria remains the EU member with the lowest level of GDP per capita and lowest productivity and income levels. In June 2018 the Bulgarian authorities submitted a letter of intent to the EU policy makers to join the ERM II mechanism and the banking union. In July 2020 the mutual agreement to include the Bulgarian lev in the ERM II mechanism and Bulgaria to join the banking union was achieved. In the context of the future full EMU membership it is important to assess the evolution and the state of Bulgaria's real convergence. This paper looks at the Bulgaria's real convergence, understood as the convergence of GDP per capita, labour productivity and convergence of price levels. We use the Beta and Sigma convergence methods and explore the convergence in the 1999-2018 period. We also compare Bulgaria's real convergence to the real convergence of other CEE countries that are EU members (Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia), part of which have already accepted the euro and the other part are still outside of the euroarea. We also try to explain the economic reasoning behind the EMU accession path of Bulgaria. The results of the survey show that Bulgaria lags behind in its convergence process from other CEE countries, but at the same time we believe that the benefits of the euroarea membership outweigh the possible negative consequences.

JEL Classification Numbers: F36, F43, F45, **DOI:** <https://doi.org/10.12955/peb.v1.13>

Keywords: convergence, euro adoption, ERM II mechanism, Bulgaria

¹ University of National and World Economy, International Economics and Politics Faculty, International Economic Relations and Business Department, Sofia, Bulgaria, v.bilyanski@unwe.bg.

² University of National and World Economy, International Economics and Politics Faculty, International Economic Relations and Business Department, Sofia, Bulgaria, s.kirova@unwe.bg.

IDENTIFICATION OF THE STAGE OF PURCHASE BEHAVIOUR RELATED TO FACIAL BIOMETRIC TECHNOLOGY AMONG BUSINESSES IN SLOVAKIA

Michal Budinský¹, Janka Táborecká-Petrovičová²

Abstract: The implementation of new technologies among businesses is a common practice, in order to keep their market position and to enhance their performance. As the world changes further, high-tech innovations and applications take place. Notably, biometric technologies and the scope of their usage is a recently discussed topic as they represent a huge potential for the improvement of business processes in distinctive areas. Their implementation in businesses generates valuable information about customers and allows businesses to more precisely fulfill their needs and requirements. Related to this, questions about business interest and preparedness for these technologies is in place. The main aim of this paper is to identify the stage of purchase behavior of the investigated businesses operating in Slovakia related to facial biometric technology. Specifically, we focused our attention on the identification of businesses in reference to a particular stage of the AIDA model and further devoted to the description of business from individual stages.

JEL Classification Numbers: O30, O31, **DOI:** <https://doi.org/10.12955/peb.v1.14>

Keywords: Biometric Technologies. Facial Biometrics. AIDA Model. Purchase Behavior.

¹ Matej Bel University, Faculty of Economics, Slovakia, michal.budinsky@umb.sk

² Matej Bel University, Faculty of Economics, Slovakia, janka.taborecka@umb.sk

STUDY ON THE OPINION OF STAKEHOLDERS ON FORESTRY ECOSYSTEM SERVICES

Elena Dragozova¹, Nevena Shuleva²

Abstract: The ecosystem services provided by forest areas have a direct and indirect impact on the quality of life of people and also increase the well-being of society. The regulatory and water protection function of forests is institutionalized in the European and Bulgarian legislation.

In the context of the current crisis in the water sector in Bulgaria there is a need to identify the stakeholder groups involved in the management, protection, control and use of the water ecosystem service. Under the crisis of water management in Bulgaria we understand the reduction of the volume of water resources and difficulties in supplying clean water to the population. Their opinion on the ecosystem of the forest and its water protection function in particular was examined by conducting a survey. The current paper identifies the different stakeholder groups and presents an analysis of the results obtained by means of a questionnaire sent to stakeholders. The results obtained are used as a basis for forming institutional links and managing conflicts in the process of generating, protecting and managing water from its source to the user. The study proved that society makes sense of the connection between the forest and the provision of clean water. Through the study, we succeeded in identifying a major problem related to the incomplete and outdated information on the maintenance of ecosystem services and improvement of the quality of the goods generated from them which is due to the poor communication between institutions coupled with the lack of awareness by the direct responsibilities of various departments and positions. The electronic platform created for the project on the one hand will support the process of information security of the technical mapping of water sources and water protection forests, as well as provide an opportunity for communication with various stakeholders. This will enable a higher information security.

JEL Classification Numbers: O13, Q23, Q25, Q26, **DOI:** <https://doi.org/10.12955/peb.v1.15>

Keywords: water, forest, ecosystem services, water protection function

¹ University of Forestry, Sofia, Bulgaria, elena.dragozova@abv.bg

² University of Forestry, Sofia, Bulgaria, shuleva.nevena@gmail.com

APPROACHES TO THE FORMATION OF SUSTAINABLE ECONOMIC DEVELOPMENT OF TRANSPORT SYSTEM

Olga Vladimirovna Efimova¹, Elena Zakharovna Makeeva²,
Elizaveta Igorevna Dmitrieva³

Abstract: The world economy as an integrated system has limited growth limits, natural resources are limited, so a new concept of sustainable economic development has emerged, based on a balance of the economy, social goals and ecology. Sustainable development is the development of the country's economy and the global system in which current needs are met without compromising future opportunities. The rapid development of transport infrastructure creates the prerequisites for the sustainable development of centers of macro and microeconomic growth and helps to reveal their potential in the future.

The article considers the role of transport as an additional priority for sustainable development at the macro level and the types / functions of connectivity of economic growth centers in the sectoral and regional aspects.

In turn, the concept of sustainable development of the transport system involves taking into account the features of the transport system as an object of increased danger and a high degree of influence on the main priorities of sustainable development (economic growth, social system and ecology) of the macroeconomics. It was noted that, on the one hand, the transport system, being part of the country's macroeconomic system, affects the priorities of its sustainable development, and on the other hand, has independent priorities for sustainable development in the field of economic growth and efficiency, social potential and environmental aspects, including issues of ensuring security.

JEL Classification Numbers: O18; O35, O44, **DOI:** <https://doi.org/10.12955/peb.v1.17>

Keywords: sustainable development, transport systems, quantitative model, connectedness

¹ Russian University of Transport, Moscow, Russia, ovefimova@mail.ru

² Russian University of Transport, Moscow, Russia, Pk_ief_mii@mail.ru

³ Russian University of Transport, Moscow, Russia, eidmitrieva@mail.ru

DIGITAL DESIGN OF PRODUCTION SYSTEMS USING VIRTUAL REALITY

**Gabriela Gabajová¹, Martin Krajčovič², Iveta Rolinčinová³, Beáta Furmannová⁴,
Monika Bučková⁵**

Abstract: The design and operation of intelligent production and logistics systems requires the strong support of digital technologies today. A production and logistics system is normally modelled in a virtual environment, allowing rapid work with an extensive data set and "what - if" analyses to help optimize the resulting system design for performance, productivity, safety and environmental performance of its future operation. This paper deals with the issue of the digital design of production systems with the effective deployment of virtual reality technologies into the individual phases of the production system design. This article describes the basic steps of the digital design methodology with the description of virtual reality application tools for the production and logistics system design, in order to reduce design defects and increase work safety. The proposed methodology has been verified in an experimental workplace, presenting real outputs. The final part of the article contains a brief discussion of the problem results.

JEL Classification Numbers: L23, L52, **DOI:** <https://doi.org/10.12955/peb.v1.18>

Keywords: production, designing, virtual reality, productivity, immersive technologies.

¹ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, email: gabriela.gabajova@fstroj.uniza.sk.

² University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, email: martin.krajcovic@fstroj.uniza.sk.

³ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, email: iveta.rolincinova@fstroj.uniza.sk.

⁴ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, email: beata.furmannova@fstroj.uniza.sk.

⁵ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, email: monika.buckova@fstroj.uniza.sk.

INCREASING THE ECOLOGICAL LEVEL OF PUBLIC TRANSPORT IN THE CITY OF SOFIA

Iliya Gatovski¹

Abstract: The paper explores some of the major factors affecting the environmental friendliness of urban bus transport, with a focus of the modernization of rolling stock and alternative sources of fuel. The surveys are based on an 11-year period, from 2008 to 2019, for which an analysis was made of how much emission reductions in buses with a higher Euro standard are being followed, as in the case of Sofia Motor Transport EAD in Sofia, Bulgaria. As a result, we conclude that transport research and innovation are crucial to ensuring fast, safe and clean transport for citizens and businesses in big cities. The transport sector is more than ever in need of innovative solutions, as the cost of transporting passengers will increase in value and time. This is especially urgent for Bulgaria as the available rolling stock is outdated and in need of renovation.

JEL Classification Numbers: L98, O18, R42, **DOI:** <https://doi.org/10.12955/peb.v1.19>

Keywords: urban transport, environmental friendliness, rolling stock, quality of transport service.

¹ University of National and World Economy, Faculty Economy of Infrastructure, Department „Economics of Transport and Energy“, gatovski@unwe.bg; i_gatovski@abv.bg

MEASURING THE POTENTIAL OF ECONOMIC DEVELOPMENT OF THE SVERDLOVSK REGION BASED ON COMPARATIVE ADVANTAGES

**Rogneda Groznykh¹, Natalia Davidson², Oleg Mariev^{3,4}, Daria Chipchagova⁵,
Ekaterina Vasilyeva⁶**

Abstract: The goal of this paper is to reveal the key industries of comparative advantage for the Sverdlovsk region in order to make conclusions about the potential of the region's economic development. We study comparative advantages of the Sverdlovsk region based on data for 85 Russian regions covering the period from 2003 to 2018. During the first stage of the research four groups of goods out of twenty-two groups were identified as those in which the Sverdlovsk region possibly has comparative advantages based on the index of revealed comparative advantages developed by Balassa and on the Lafay index. During the next stage, the existence of comparative advantages in these categories of goods was checked by comparison with the other regions of Russia. According to the results of the research a range of recommendations can be developed to foster economic growth of the Sverdlovsk region.

JEL Classification Numbers: F10, F14, O10, **DOI:** <https://doi.org/10.12955/peb.v1.20>

Keywords: revealed comparative advantage, the Balassa index, the Lafay index, Russian regions, economic development, Sverdlovsk region

¹ Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, ronav999@gmail.com

² Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, natalya.davidson@gmail.com

³ Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation o.s.mariev@urfu.ru

⁴ Institute of Economics, The Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russian Federation

⁵ Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, llcc1976@mail.ru

⁶ Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, nikkiblac@mail.ru

THE IMPACT OF ECONOMIC, DEMOGRAPHIC, AND INFRASTRUCTURAL FACTORS ON INCOME INEQUALITY AND POVERTY IN RUSSIA.

Rogneda Groznykh¹, Elena Ignatieva², Oleg Mariev^{3,4}, Alla Serkova^{4,5}

Abstract: The prime objective of the research is to examine the factors influencing both the alteration in the income distribution and the relative change in the incidence of poverty in the regions of Russia. The list of the identified factors/determinants includes economic, demographic, and infrastructural factors. An econometric model, indicating the relationship between the explanatory variables with both the income inequality index and the relative poverty proportions in Russian regions has been provided in this article. The determinants that cause variations in the income inequality and poverty of a country such as social mobility, average life expectancy of urban women, life expectancy of rural men, the number of university graduates, etc. have also been specified in this study. The analysis was executed based on a dataset of 72 Russian regions for the period between 2012-2017.

JEL Classification Numbers: I32, I38, **DOI:** <https://doi.org/10.12955/peb.v1.21>

Keywords: Poverty, Distribution of the Incomes, Policy Measurements

¹ Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, ronav999@gmail.com

² The Ural Branch of Russian Academy of Sciences, Yekaterinburg, Russian Federation, elen_i99@mail.ru

³ Graduate School of Economics and Management, Ural Federal University, and Institute of Economics, The Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russian Federation, o.s.mariev@urfu.ru

⁴ Institute of Economics, The Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russian Federation

⁵ Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, muccio@bk.ru

THE ROLE OF POLITICAL STABILITY IN FOREIGN DIRECT INVESTMENT ATTRACTION: CROSS-COUNTRY ANALYSIS

Rogneda Groznykh¹, Oleg Mariev^{2,3}, Sergey Plotnikov⁴, Maria Fominykh⁵

Abstract: This study is devoted to the evaluation and scrutiny of political stability as a determinant of foreign direct investment (FDI) inflows to different countries. The primary objective of the research is to estimate the impact and influence of various indicators of political stability on foreign direct investment inflows. The analysis is delivered based on a database on cross-country FDI inflows of 66 FDI-importer countries and 98 FDI-exporter countries, in the period between 2001-2018. This article uses the assumption that the impact of political stability might be different for both the groups of developed and developing countries. As the developed economies have higher political stability, they tend to attract larger amounts of foreign direct investment compared to developing economies, where the political situation can be less stable. Furthermore, the estimation applies the gravity approach, while the main method used for the econometric calculations is the Pseudo Poisson Maximum Likelihood (PPML) regression. The outcome revealed that in most cases the indicators of political stability had a positive impact on the foreign direct investment inflows. However, the results are not constant for all groups of countries. Therefore, if a developed country is an importer of investment, then most of the indicators of political stability become significant and have a positive influence on the foreign direct investment. At the same time, if the importer is a developing country, then for the investor-developed economy, political stability becomes a significant factor. Similarly, if the FDI-exporter is a developing economy, then determinants of political stability are insignificant. Based on these results, possible recommendations for refined government policies can be suggested.

JEL Classification Numbers: F21, **DOI:** <https://doi.org/10.12955/peb.v1.22>

Keywords: Foreign Direct Investment, Institutional Environment, Gravity Model, Government Stability, Internal and External Conflicts, Democracy

¹ Ural Federal University, Graduate School of Economics and Management, Department of Econometrics and Statistics, Yekaterinburg, Russian Federation, roned.groznykh@urfu.ru

² Graduate School of Economics and Management, Ural Federal University, Yekaterinburg, Russian Federation, o.s.mariev@urfu.ru

³ Institute of Economics, The Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russian Federation, o.s.mariev@urfu.ru

⁴ Ural Federal University, Graduate School of Economics and Management, Department of Econometrics and Statistics, Yekaterinburg, Russian Federation, serge.plotnikov@gmail.com

⁵ Ural Federal University, Graduate School of Economics and Management, Department of Econometrics and Statistics, Yekaterinburg, Russian Federation, maria.fominykh@gmail.com

OPTIMIZATION OF LOGISTICS PROCESS IN CONTEXT OF SMART LOGISTICS BY USING COMPUTER SIMULATION – CASE STUDY

**Patrik Grznár¹, Milan Gregor², Štefan Mozol³, Marek Schickerle⁴,
Vladimír Vavřík⁵, Lucia Mozolová⁶**

Abstract: In the conditions of shipment processing it is important to observe the timetable of dispatch in which the entire processing process is going on. Each element of the processing system is important and it is linked with others by time. This means that the delay of one element causes an avalanche effect. The use of computer simulation helps in optimizing processing processes as a whole. This helps to detect regularities and bottlenecks that have been previously overlooked. The concept of Smart Logistics as part of the Smart Factory using simulation as a tool to estimate the future behaviour of the system. The article describes its own system for determining the number of staff to perform the required activities within the processing process. On the basis of the actual number of shipments, the arrival times and the processing system data, a solution can be described using a simulation tool to determine the number of workers. The simulation helps us to design the number of workers so that they observe the times of truck departures from the processing depot. This guarantees compliance with the timetable at minimum labour costs.

JEL Classification Numbers: L87, **DOI:** <https://doi.org/10.12955/peb.v1.23>

Keywords: Smart Logistics, shipment processing, computer simulation, number of workers, timetables.

¹ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, Žilina, Slovakia, patrik.grznar@fstroj.uniza.sk

² University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, Žilina, Slovakia, milan.gregor@fstroj.uniza.sk

³ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, Žilina, Slovakia, stefan.mozol@fstroj.uniza.sk

⁴ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, Žilina, Slovakia, kpi@fstroj.uniza.sk

⁵ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, Žilina, Slovakia, vladimir.vavrik@fstroj.uniza.sk

⁶ University of Žilina, Faculty of Mechanical Engineering, Department of Industrial Engineering, Žilina, Slovakia, pavlinova2@stud.uniza.sk

COOPERATION OF ENTERPRISES WITH SECONDARY VOCATIONAL SCHOOLS: COMPARATIVE ANALYSIS IN THE CONTEXT OF THE CZECH REPUBLIC AND SLOVAKIA

Michal Hanák¹, Katarína Ižová², Kateřina Bočková³

Abstract: The presented paper deals with the mutual cooperation of secondary vocational schools and enterprises within the framework of the dual education system, respectively of the social partnership in the conditions of Czech Republic and Slovakia. It has a theoretically - empirical character. In the theoretical part we focused on defining the terms we work with and the empirical part focuses on the questionnaire survey, in which we find out the views of pupils, teachers and enterprise representatives on the real possibilities and possible benefits of cooperation between schools and business sector. In the framework of the questionnaire survey we focused on the Zlín region in the Czech Republic and the Žilina region in Slovakia, while the selection of the area was random. Using two self-designed questionnaires, we found out what pupils, teachers and enterprise representatives consider to be beneficial for the cooperation and what is necessary to be improved. Based on the findings, we have drawn conclusions and suggested measures to improve the current situation. We found that the social partnership in the Czech Republic is at a higher level and more secondary vocational schools are involved than the dual education system in Slovakia.

JEL Classification Numbers: I25, **DOI:** <https://doi.org/10.12955/peb.v1.24>

Keywords: Dual education. Social partnership. Cooperation. Benefits and improvements.

¹ DTI University, Department of School Didactics, Dubnica nad Váhom, Slovakia, hanak@dti.sk

² DTI University, Department of Management and Economics, Dubnica nad Váhom, Slovakia, izova@dti.sk

³ DTI University, Department of Management and Economics, Dubnica nad Váhom, Slovakia, bockova@dti.sk

WHAT AFFECTS THE IMPLEMENTATION AND REALISATION OF STRATEGY IN ORGANISATIONS?

Viktors Hiršsons¹, Iveta Ludviga²

Abstract: In today's changing environment companies are pushed to be flexible, develop new strategies and implement change plans. Strategy implementation and realisation is a critical component of organizational performance, however, many organizations fail to implement their strategic plans, while others could not achieve their desired results. In practice nowadays more attention is paid to the implementation of the strategy than to its creation, still strategy research most often treats strategy execution and realisation as a black box. The aim of this study is to find out the factors influencing the successful implementation and realization of business strategy in Latvian organizations. Quantitative research using a structured questionnaire (n = 440) and a multivariate linear regression analysis shows that managerial competence and leadership followed by clarity of goals play a decisive role in the successful implementation of business strategy. Implications of the results for managerial practice are discussed and propositions for future research provided.

JEL Classification Numbers: M10; M19, **DOI:** <https://doi.org/10.12955/peb.v1.25>

Keywords: strategy, implementation, realization, Latvia

¹ RISEBA University of Applied sciences, Riga, Latvia, v.hirssons@inbox.lv

² RISEBA University of Applied sciences, Riga, Latvia, iveta.ludviga@riseba.lv

MACROECONOMIC FACTORS AND THEIR INFLUENCE ON THE VISEGRAD GROUP EXCHANGE RATES

Kitty Klacsánová¹, Mária Bohdalová²

Abstract: The paper analyzes the effects of macroeconomic development on exchange rates and aims to point out indicators with a significant impact on the Visegrad Group's domestic currencies. Steep changes causing the Visegrad Group's currencies to either appreciate or depreciate against the US dollar may result in higher risks for investors and even deteriorate the competitiveness of the particular country. The paper presents several macroeconomic indicators and their influence on four currencies, namely the Czech crown, Hungarian forint, Polish zloty and the Euro. As the Slovak Republic introduced the Euro as its official currency, the paper also analyzes its impact on the common currency of the Eurozone. To emphasize international competitiveness, the research apart from traditional economic indicators, serving as a focal point in theories for exchange rate determination, incorporated economic complexity and corruption score as well. The findings indicate that during the period between 2000 to 2017, the two common indicators i.e. total reserves and corruption played the key role in determining the year-end spot exchange rates of the Czech crown, Hungarian forint and the Polish zloty. Besides corruption score, economic complexity serves as another significant indicator merely influencing the direction of the Euro's and the Zloty's Dollar exchange rate movement. The last section compares the results of the OLS analyses for each country and verifies their accuracy through robust regressions. Overall, the model for the Czech crown represents the highest accuracy, regarding its predictive ability.

JEL Classification Numbers: F31, F41, E40, **DOI:** <https://doi.org/10.12955/peb.v1.26>

Keywords: Exchange rate, Macroeconomic factors, Corruption score, Visegrad group countries.

¹ Comenius University in Bratislava, Faculty of Management, Department of Quantitative Methods,
Kitty.klacsanova@fm.uniba.sk

² Comenius University in Bratislava, Faculty of Management, Department of Quantitative Methods,
maria.bohdalova@fm.uniba.sk

SELECTED ASPECTS OF THE INTERNET OF THINGS DURING GLOBALIZATION

Martina Kovacikova¹, Katarina Repkova Stofkova²

Abstract: Continuous technological progress makes it possible to use the Internet of Things (IoT) in broader dimensions. Digitization, computerization, and innovation are now key factors for businesses and countries to achieve added value and make progress in competitiveness and attractiveness. These are also optimal conditions for the application of IoT. This study aims to show the status of the implementation of IoT in neighboring countries — the Slovak Republic and the Czech Republic — compared to the United Kingdom, which is in the lead. Similarly, the goal was to compare the areas of digitization and informatization to the Networked Readiness Index (NRI), the Digital Economy and Society Index (DESI), and the Digital Transformation Scoreboards (DTS). Material support for this paper was garnered from the relevant literature. The theoretical basis for issues related to IoT was presented after analyzing secondary sources to determine the current state of the industry and the level of digitization. The those indexes were compared using data from Slovakia, the Czech Republic, and the UK. The UK is among the leaders in the field of IoT. The resulting data are presented graphically. Slovak companies that operate mainly in the industrial sector are beginning to discover and implement IoT. More and more cities are adopting this technology. The situation in the UK is already quite far along. During the evaluation of the NRI, DESI, and DTS, Slovakia was ranked lowest, the Czech Republic was ranked slightly higher, and the UK was rated the highest. Comparison of the digitization of the economy and society, and the deployment and use of ICT highlight the need for further development of these areas in the Slovak and Czech republics.

JEL Classification Numbers: O32, P42, F15, **DOI:** <https://doi.org/10.12955/peb.v1.27>

Keywords: Internet of Things, digitalization, globalization

¹ University of Zilina, Faculty of operation and Economics of Transport and Communication, Department of Communication, Slovakia, martina.kovacikova@fpedas.uniza.sk

² University of Zilina, Faculty of operation and Economics of Transport and Communication, Department of Communication, Slovakia, katarina.stofkova@fpedas.uniza.sk

THE CONSOLIDATION OF FOREST TERRITORIES AS A TOOL TO IMPROVE THEIR MANAGEMENT

Nikolay Neykov¹, Petar Antov², Ilko Dobrichov³, Aureliu-Florin Halalisan⁴,
Emil Kitchoukov⁵

Abstract: Land consolidation in forest areas is a problem that has been prevalent in Bulgaria in recent years. This is a problem in all forests where ownership is distributed between the State, municipalities and private owners. Timber harvesting and exportation is much easier and cheaper when access is easier. This article summarizes the main directions of forest land consolidation, highlighting the leading understanding in scientific research to date. The purpose of the study is to provide some basic steps related to forest territory consolidation that allow to determine its economic effectiveness. The current paper is the first step in developing an optimization model to support the forestry units in Bulgaria and in other countries which have undertaken such a difficult task.

JEL Classification Numbers: B41, Q23, P51, **DOI:** <https://doi.org/10.12955/peb.v1.28>

Keywords: forest land, consolidation, forest management

¹ University of Forestry, Sofia, Bulgaria, Faculty of Business Management, nneykov@itu.bg

² University of Forestry, Sofia, Bulgaria, Faculty of Forest Industry, p.antov@itu.bg

³ University of Forestry, Sofia, Bulgaria, Faculty of Forestry, nneykov@itu.bg

⁴ Transilvania University of Brasov, Romania, aureliu.halalisan@unitbv.ro

⁵ University of Forestry, Sofia, Bulgaria, Faculty of Business Management, ekitchoukov@itu.bg

THE IMPACT FACTORS ON PROJECT MANAGEMENT SUCCESS IN GLOBAL TEAMS: THE CASE OF COMPANY “X” PROJECTS

Inese Sluka¹, Sintija Kristine Brence²

Abstract: Nowadays, with globalization and the development of information technology, global teams are one of the fastest growing types of teams. Communication technology capabilities have significantly reduced the cost of team management and remote collaboration. Current management science has a broad theoretical basis for managing teams that are physically located in one place, but there is much less understanding of how leaders can effectively manage global teams.

Company X is a global management consulting, technology services and outsourcing company. All company projects have virtual teams and participants from different countries

The goal of this research is to identify and study the factors that influence the success of global project team management and operations in Company X.

The research provides answers to the following questions: 1) Which factors impact the project management success at global company X?; 2) What is the impact of a team member's role and experience on project management success at company X?; 3) What are the cultural differences within the project teams?

The data was collected from a survey of two global teams (n=31) at global company X. Team members represent three cultures: Finnish, Indian and Latvian. The analyzed factors were communication, remote communication tools, roles and rules, and trust and cooperation in a multicultural environment. Communication, remote communication tools, and roles and rules showed a statistically significant impact on project management success in global teams. The current role of team members has a negative effect on project management success.

No statistically significant differences between cultures were found which supports Cultural Convergence Theory which suggests that two cultures will be more and more like each other as their interactions increase.

JEL Classification Numbers: M14, **DOI:** <https://doi.org/10.12955/peb.v1.29>

Keywords: global team, project management success, culture differences

¹ RISEBA University of Applied Sciences, Riga, Latvia, inese.sluka@riseba.lv

² RISEBA University of Applied Sciences, Riga, Latvia, sintija.brence@outlook.com

BLACK SWAN EVENT: AN EVIDENCE FROM CHINA'S ECONOMICS EFFECTS

Elena Stavrova¹, Mariya Paskaleva², Ani Stoykova³

Abstract: The prognosis of upcoming crises and the course of actually understanding them is increasingly becoming a major subject of discussions in pursuit of reliable indicators. The trade war between the United States and China, along with the COVID-19 pandemic are two events that took place in the Chinese economy with the aforementioned characteristics of the Black swan phenomenon, to which this latest professional analysis is devoted. The objective of this research is to examine the response of the Shanghai Stock Exchange Composite (SSEC) index, in addition to its relation with macroeconomic variables contributing towards a possible Black Swan Event. We employ an econometric methodology comprising of a unit root test, descriptive statistics, linear regression and correlation analysis for the period 2007-2019. Our results illustrate that the bubble from 2015, which is classified as a Black Swan event by many researchers, has a negative influence on the SSEC index. We can further deduce that there were some psychological effects on the Chinese stock market that lead to both, positive and negative trends of SSEC indices. The main findings confirmed that the Consumer Price Index, Exchange Rate, Interest Rate, Unemployment, GDP and Trade Balance were significantly elaborative macroeconomic variables, that had a substantial impact on the SSEC index.

JEL Classification Numbers: E44, G15, G17, H12, DOI: <https://doi.org/10.12955/peb.v1.30>

Keywords: Black Swan crisis and China's economy, macroeconomic indicators, stock market index, correlation.

¹ South-West University "Neofit Rilski"-Blagoevgrad, Blagoevgrad, Bulgaria, helena_stavrova@abv.bg

² South-West University "Neofit Rilski"-Blagoevgrad, Blagoevgrad, Bulgaria, m.gergova@abv.bg

³ South-West University "Neofit Rilski"-Blagoevgrad, Blagoevgrad, Bulgaria, ani_qankova_st@abv.bg

GUIDELINES FOR IMPROVING THE ENVIRONMENTAL FRIENDLINESS AND SAFETY OF RAILWAY TRANSPORT FREIGHTS OF DANGEROUS CARGO WITHIN THE REPUBLIC OF BULGARIA

Svetla Tzvetkova¹

Abstract: The ecological, social and safety implications of railway transport freights of dangerous cargo require addressing the fact that while hazardous substances are an integral part of people's way of life in the modern age, they can adversely and severely affect living standards. The incorrect storage, transportation, loading and unloading of dangerous cargo could pose a serious threat to people, their property and the environment. In recent years, accidents involving the transportation of dangerous cargo have become more frequent. An indicative example in this regard is the explosion of several cisterns containing propane-butane at the railway station in the village of Hitrino – a severe accident which killed seven people and injured ninety-nine. This can be classified as an ecological and social disaster. The present article is a response to a multitude of such accidents and to issues such as poor conditions of railway infrastructure, outdated and obsolete rolling stock, lack of qualified personnel and lack of measures for limiting harmful impact on the environment. The goal of this paper is to justify the necessity for improving the environmental friendliness and safety of railway transport freights of dangerous cargo within the Republic of Bulgaria and to indicate specific measures and guidelines to this effect. The topicality of the paper is supported by the probability of reoccurrence of these ecological disasters with irreversible consequences for people and the environment.

JEL Classification Numbers: R40, R41, R48, R49, **DOI:** <https://doi.org/10.12955/peb.v1.31>

Keywords: rail transport, transport of dangerous goods, guidelines for improving the safety of transport of dangerous goods

¹ Department – “Economics of Transport and Energy”, Faculty – “Economics of Infrastructure”,
University of National and World Economy - Sofia, Bulgaria, svetlatzvetkova@abv.bg

EU POLICY AGAINST FALSIFIED MEDICINES: OPTIONS FOR FURTHER DEVELOPMENT

Krasimira Valcheva¹

Abstract: The globalization of trade and internet access significantly increased the health risks associated with falsified medicines. International organizations, pharmaceutical companies and national governments developed a wide variety of measures to combat their pervasive penetration into the legal supply chains. However, the lack of harmonization, broad acceptance and legally bound enforcement obstructed their endeavours. The unsatisfying outcomes resulted in enhanced supranational cooperation focused on strengthening the pharmaceutical regulatory frameworks and the improvement of patient protection.

In 2011 the European Union joined the global fight with the adoption of Directive 2011/62/EU that became known as the Falsified Medicine Directive. It is legally binding for Member States and amends the fundamental for the pharmaceutical sector Directive 2001/83/EC. The objective of the present paper is to verify if it represents a comprehensive tool for effective prevention of the access of falsified medicines in the European legal pharmaceutical supply chains. The results revealed that although it is rather detailed, there are areas that could be further developed and improved when compared to analogical policies and initiatives.

JEL Classification Numbers: I18, K33, O38, **DOI:** <https://doi.org/10.12955/peb.v1.32>

Keywords: falsified medicine, policy, regulations, supply chain, track-and-trace

¹ Management and Administration Faculty, University of National and World Economy, Sofia, Bulgaria, kvalcheva@unwe.bg

STRATEGIES FOR THE EXTENSION OF THE WINTER SEASON AT MOUNTAIN RESORTS IN BULGARIA

Elenita Velikova¹

Abstract: The achievement of the sustainable development of mountain tourist resorts is questionable in the light of global warming. Increasing average temperatures is a precondition of the additional shortening of the winter tourist season at mountain territories in Bulgaria. The goal of the present publication is to extract strategies for extension of the winter season at mountain resorts in Bulgaria, by proposing effective mechanisms, based on the tourists' preferences and the abilities of tourist entrepreneurs. Based on expert analysis of Bulgarian tourist resorts, personal researches and experience in the researched topic, we determine alternative sources of offering and organization of event as the main possibilities of extending the season. The effect of this research can go in two directions: on one hand, by identifying and discussing the basic concept of seasonality, it will contribute to the enrichment of scientific knowledge in the field with potential for future research. On the other hand, it can be beneficial to destination managers as it will offer a better understanding of the importance of holding unique events to shape the destination's image, reduce seasonality and develop a sustainable economy based on tourism.

JEL Classification Numbers: G14, L83, R11, Z31, **DOI:** <https://doi.org/10.12955/peb.v1.33>

Keywords: winter tourist season, mountain resorts, special events, alternative types of tourism

¹ University of National and World Economy, Faculty Economy of Infrastructure, Department Economy of Tourism, evelikova@unwe.bg; elenita@abv.bg.

Section 2: Social Sciences

TAXONOMY PROBLEMS OF VERBAL INFLUENCE TACTICS AND STRATEGIES

Irina Akateva¹, Lev Vasilev², Ekaterina Oshanova³

Abstract: Human communication has been a relevant area of social research for last 50 years. It attracts the attention of psychologists, sociologists, culturologists, and, of course, linguists. The theory of verbal influence, which arose at the intersection of argumentation, rhetoric, and pragmatics, is now at the stage of forming its own terminological research vocabulary, as is evidenced by the lack of an elaborate system of tactics and strategies. The article highlights leading approaches to this problem within the framework of various scientific disciplines. It is worth mentioning that special contribution to the development of persuasion theory was made by marketers, by specialists in behavioral economics, by social psychologists and psychotherapists, that is, scholars and practitioners who did not study linguistic problems properly. The proposed conclusions make it possible to use theoretical achievements of related humanitarian disciplines to enrich the linguistic theory of persuasion.

UDC Classification: 81'42, **DOI:** <https://doi.org/10.12955/pss.v1.34>

Keywords: communication, verbal influence, compliance-gaining strategies, variable interpretation of reality.

¹ Department of foreign languages, Izhevsk State Agricultural Academy, Izhevsk, Russian Federation, akatjewa@mail.ru

² Department of linguistics and foreign languages, Tsiolkovsky Kaluga State University, Kaluga, Russian Federation, argumentation@mail.ru

³ Department of Linguistics, Kalashnikov Izhevsk State Technical University, Izhevsk, Russian Federation, oshanova_katja@mail.ru

CAREER ATTITUDES OF STUDENTS IN THE PROCESS OF TRANSITION TO UPPER SECONDARY EDUCATION

Desislava Aleksandrova¹, Dimitar Iskrev²

Abstract: The behavioural dimensions of students' career choices in the process of transition to upper secondary education are of particular pedagogical interest. Studying career attitudes will not only contribute to outlining the status, completeness and effective use of personal paths but will also provide efficient means by which the future professional career will be pursued.

The conducted original study included 64 seventh-grade students from educational institutions, typical for the Bulgarian education system. The behavioural dimensions of a career choice, i.e. Planning and exploration, were studied using a self-evaluation rating scale. It included a series of questions for the respondent, to self-report on the degree of expression of the relevant aspect of their career choice.

The actual expression of career attitudes in seventh-graders is determined by a small number of internal factors (in most cases two) of well-defined nature for each career development component. For the planning part, they are related to specifying the perceptions of career goals and their temporal boundaries. For the exploration part, the factors reflect the nature of the information source, i.e. informal or institutionalized.

The study of the behavioural dimensions of career development forms a basis for conclusions on students' readiness to make informed career choices and their needs in this regard. In this way, the place and role of the school as a socializing institution in the process of personal development are outlined.

UDC Classification: 37.04, **DOI:** <https://doi.org/10.12955/pss.v1.37>

Keywords: career development, career attitudes, educational transition, career planning and career exploration

¹ South-West University of Blagoevgrad, Faculty of Engineering, Technology Training and Vocational Education Department, desislava_alexandrova@abv.bg

² South-West University of Blagoevgrad, Faculty of Engineering, Technology Training and Vocational Education Department, d_iskrev@abv.bg

PSYCHOMETRIC INDICATORS OF THE SOCIAL AND EMOTIONAL LONELINESS SCALE FOR ADULTS - SHORT VERSION (SELSA-S) IN BULGARIA

Nataliya Alexandrova¹, Liliya Babakova²

Abstract: This article examines the psychometric indicators of Social and Emotional Loneliness Scale for Adults, the short version (SELSA-S; DiTommaso, Brannen, & Best, 2004). The scale contains 15 items, divided into three scales: social loneliness, emotional loneliness, and romantic loneliness. The survey was attended by 1713 persons over 60 years of which were 1042 women and 671 men; and 383 of whom were in early-to-middle adulthood (20-55 years). The results showed high-reliability ratios for both the full scale ($\alpha = 0.825$) and the three subscales ($\alpha = 0.727-0.845$) versions. The factor analysis showed a four-factor structure of the scale. There were also statistically significant correlations between the three subscales. It was found that social and emotional loneliness had the strongest influence among older people. Therefore, it was necessary to create more opportunities for satisfactory communication, forms, and functioning of social contacts. It was found that the romantic loneliness had the strongest influence on younger people, i.e., they experienced significantly the lack of a partner by them or dissatisfaction with him.

UDC Classification: 005, 378, **DOI:** <https://doi.org/10.12955/pss.v1.38>

Keywords: psychometric indicators, validation, Social and Emotional Loneliness Scale, Aging, Adulthood

¹ International Business School, Sofia, Bulgaria, alexandrovana@yahoo.com

² Academy of Music, Dance and Fine Arts, Faculty of Musical Education, Plovdiv, Bulgaria, babakova_lilia@abv.bg

LEXICAL NOMINATION AS A REFLECTION OF CULTURAL AND HISTORICAL EXPERIENCE IN OLD ENGLISH SEAFARING

Natalia A. Atnabayeva¹, Vladimir G. Baltachev², Yekaterina V. Troynikova³,
Lilia I. Khasanova⁴

Abstract: The theory that nominative processes extended through centuries to systematic formations of special terminological meanings of professional Old and Middle English marine terminological vocabulary had already been explained in different ways based on an evidential linguistic material. There is no doubt of the historical and philosophical approaches employed to describe the ancient language representation of the native speakers' world, as well as of the role and degree of their participation in the formation of nominations inclusive of those of ancient seafaring vehicles. Having been referenced repeatedly, both conceptually and through documents, they had confirmed their right to exist.

In several topical articles, terminological units have already been represented by a synonymous series of proper nominations for the seafaring vessels (boats/ships) of various types by respective lexically-organized terms according to their word-formation, structural and content design in the Old and the Middle English. Despite the apparent decline of interest towards the subject of historical nominations in general, and the history of the English Marine language in particular, there are unsettled challenges in the field. Specifically, more clarity is required regarding the incentives, degree of participation and the role of extralinguistic (human) factor in the history of a vessel-name formation, as well as in the mode of operation of the nominative apparatus for the above marine terms with respect to the of intralinguistic (language) factors involved.

UDC Classification: 811.111'01 / 811.111'04, **DOI:** <https://doi.org/10.12955/pss.v1.39>

Keywords: terminological units, Germanic languages studies, coasting crafts, medium sized vessels, tonnage vessels, semantic mapping, discrete nominations, broad-value nomination.

¹ Izhevsk State Agricultural Academy, Russian Federation, atnabaeva.nataly@mail.ru

² Izhevsk State Agricultural Academy, Russian Federation, genizh@yandex.ru

³ Udmurt State University, Izhevsk, Russian Federation, ekatroj@gmail.com

⁴ Udmurt State University, Izhevsk, Russian Federation, hasanovalilia@gmail.com

PARTICIPATION OF INDIVIDUALS IN PUBLIC DECISIONS IN THE POLISH LEGAL SYSTEM-THE OUTLINE

Agata Barczewska-Dziobek¹

Abstract: The idea of good governance is associated with the postulate of participatory and interactive democracy. This results in the appearance in the legal system of solutions reflecting the recommendations of the so-called "good administration." Good administration is the subjective right which, in the relationship between the body and the citizen, defines the individual's rights and the duties of the administration to act in a particular way. It may be interpreted differently, but it must comply with universal standards. They have been defined in international, European and soft law. These include the rule of law, equality, administrative transparency, confidence and trust, as well as the opportunity to participate in decisions. The last of these relates to procedures for involving citizens in administrative decision-making.

The purpose of the article is to present normative solutions in Polish law that guarantee citizens participation in decision-making processes at various levels of administration and their systematics. To achieve this goal, the method of legal text analysis was used, which allows us to indicate the existence of many different mechanisms of participation. Their presence in Polish law determines the varying levels of civic influence on public decisions.

UDC Classification: 342.1, **DOI:** <https://doi.org/10.12955/pss.v1.40>

Keywords: good governance, right to good administration, participation, administrative decision-making

¹ University of Rzeszow, Faculty of Law, Department of Administrative Science, adziobek@ur.edu.pl

TRAINING STUDENTS FROM PEDAGOGICAL SPECIALTIES OF TRAKIA UNIVERSITY (STARA ZAGORA, BULGARIA) TO DEVELOP ELECTRONIC TESTS

Marian Delchev¹

Abstract:

Background: The evolution and application of digital didactic tests for the evaluation of the knowledge and skills of pupils has become a major element in the academic training of students who opted for pedagogical specialties. This reflects the strong propensity for the optimization and improvement of the efficacy of teaching. This article puts forward a scientific research as well as a case study on first-hand experience in training students from pedagogical specialties in academic diagnostics and examination, together with practical tasks geared towards the formation of professional digital competence with regard to the employment of ICT in diagnostic procedures through classical, face-to-face, and mixed-form training.

Objectives: The main aim of the study is to examine particular characteristics and opportunities, and to analyze the efficiency of the training provided for the development and design of electronic tests by future teachers in the course of the scholastic training.

Methods: The experiment involved qualitative and quantitative research. The following techniques were applied: observation, content analysis, and mathematical and statistical methods of data processing. The statistical methods employed were the non-parametric Mann-Whitney and Kruskal-Wallis tests.

Results: The survey included 150 students from three specialties in the Faculty of Pedagogy at Trakia University of Stara Zagora. The framework and composition of the e-learning course and the details of the face-to-face follow-up training are explained briefly. Aggregated data from the learning management system's, Moodle's, logs is also provided alongside representative observation data, and a summary with remarks on the findings from the practical classes with the students is also presented.

Conclusion: A comparative scrutiny of the learning outcomes was conducted and the principal dependencies and typical merits and demerits of the two forms of training were identified and portrayed in the article. The variation in the end results was found to be statistically significant.

UDC classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.41>

Keywords: e-assessment, e-learning, blended learning, e-test

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, marandelchev@gmail.com

IMRAD USAGE IN LATVIAN LANGUAGE RESEARCH PAPERS

Agnese Dubova¹, Baiba Egle², Egita Proveja³

Abstract: Within the scientific discourse it is commonplace to write articles based on the IMRAD structure (Introduction, Methods, Results, and Discussion). This structure is typical for the natural sciences (STEM) but scientists in other disciplines are also often required to use it. This paper looks at scientific texts in Latvian published from 2008 to 2018. The basis for this research project is a corpus of 758 scientific articles from natural sciences, engineering and technology, social sciences, humanities and arts. The aim is to show in which disciplines IMRAD is a dominant structure for texts written in Latvian and what wording authors use. It could be concluded that in the structure of Latvian scientific texts have a significant variation in the use of IMRAD and there are different wording versions used, it aligns to previous research about scientific text structure in other languages and cultures. Not all Latvian scientific texts adhere to the IMRAD structure and there are deviations based on the discipline.

UDC Classification: 811.174, **DOI:** <https://doi.org/10.12955/pss.v1.42>

Keywords: Latvian, scientific article, text macrostructure, intralingual

¹ Ventspils University of Applied Sciences, Faculty of Translation Studies, agnese.dubova@venta.lv

² Ventspils University of Applied Sciences, Faculty of Translation Studies, baiba.egle@venta.lv

³ Ventspils University of Applied Sciences, Faculty of Translation Studies, egita.proveja@venta.lv

TRANSLATING CRAFT TRADITIONS: PROBLEMS OF TERMINOLOGY IN LATVIAN TRADITIONAL KNITTING BOOKS

Baiba Egle¹

Abstract Language for special purposes is in every aspect of life, even our cultural traditions and crafts. Often, cultural terms seem self-explanatory to the people within the source text culture, in this case, Latvians, and might be unknown to other cultures. There is often a goal to achieve perfect equivalency in translation, so there should be a translation for every term. However, it is not always possible to transfer the meaning of a concept that has both technical and cultural aspects. The translator has to look at both the source and the target culture's knowledge to adapt the translation as needed.

This paper will look at the terminological problems encountered within the English translations of two books that look at Latvian traditional knitting – Suiti patterned socks and south Kurzeme jackets. While it might seem like these books describe simple items, there is a lot of special terminology used therein. Through a selection of translation problems found in these sources, the cause of the mistakes is explored and the suggestions of the correct variant are given. The results of the research show that while specific cultural terms can be hard to translate, there are strategies to translate even the most complex culture-bound terms correctly and what skills and background knowledge are needed for it.

UDC Classification: 811.174, **DOI:** <https://doi.org/10.12955/pss.v1.43>

Keywords: Latvian, English, translation, knitting, specialized language

¹ Ventspils University of Applied Sciences, Department of Translation Studies, Ventspils, Latvia.
baiba.egle@venta.lv

BURNOUT SYNDROME IN RELATION TO THE SENSITIVITY OF NURSES, TEACHERS AND SOCIAL WORKERS

Júlia Fričová¹, Katarína Kohútová², Lenka Štefáková³

Abstract:

Background and objectives: Burnout syndrome is considered as a serious public health problem that affects workers especially in the helping professions. For the effective prevention of this negative phenomenon, it is important to identify the preventive factors. One such factor to combat job burnout is the meaning of life. The primary goal of the paper is to examine the relationship between burnout syndrome and different dimensions of meaning of life among the selected helping professions (teaching, social work and nursing) in Slovakia.

Methods: The research sample consisted of 212 assistants who participated in the survey and answered to the research tools aimed at identifying the meaning of life and burnout syndrome. Data were analyzed by inductive statistics including (ANOVA), correlation and regression analysis.

Results: Statistically significant differences were found in the level of burnout syndrome and meaning of life in the professions under study. Furthermore, it was found that workers with higher level of affective component in their meaning of life experienced a lower degree of emotional exhaustion ($\beta = -.37, p < .001$) and higher personal performance ($\beta = .35, p < .001$). Workers who have a higher meaning in life in the affective and motivational component suffered from a lower degree of depersonalization ($\beta = -.49, p < .001$; $\beta = .13, p < .05$).

Conclusions: A higher degree of meaning in life result in lower rate of burnout syndrome, and this finding should be integrated into the intervention strategies aimed at the prevention and treatment of burnout syndrome. Regular reflections on the meaningfulness of work and life can be useful for the workers, especially during demanding and stressful periods. An existential approach seems to be very appropriate in this context.

UDC Classification: 305-055.1, 305-055.2, **DOI:** <https://doi.org/10.12955/pss.v1.45>

Keywords: Burnout, Life meaning, Nurses, Social workers, Teachers.

¹ Catholic university in Ružomberok, Faculty of Education, Department of Social Work, julia.fricova801@edu.ku.sk

² Catholic university in Ružomberok, Faculty of Education, Department of Social Work, katarina.kohutova@ku.sk

³ Catholic university in Ružomberok, Faculty of Education, Department of Social Work, lenka.stefakova@ku.sk

GENDER STEREOTYPES IN THE PROFESSIONAL APPROACH OF SOCIAL WORKERS IN SLOVAKIA, THE CZECH REPUBLIC AND LITHUANIA

Júlia Fričová¹, Lenka Štefáková², Katarína Kohútová³

Abstract

Background and Objectives: Gender stereotypes and the conventionalization of terms like motherhood and fatherhood have, of lately, been a subject of heated debated and have been a dichotomizing theme for the society. A fraction of the population recognizes the allotment of the model role of a mother, as the caregiver and homemaker, and that of a father, as the caretaker and breadwinner, while the other segment of people oppose this allocation of functions and responsibilities. These circumstances, in turn, influence diverse domains of the society's operations, in addition to social workers whose clientele merely consists of fathers and mothers.

Main Goal: The central purpose of the study is to juxtapose and discern the prevalence of stereotyped gender depictions, representing the ideal role expected and presumed from men and women, within families of social workers in Slovakia, the Czech Republic and Lithuania.

Methods: The primary method used for producing this research was that of pragmatic analysis and detailed evaluation of derivative secondary data which aided in the formulation of conclusions for the study regarding the topic in concern. Investigative results of the three studies, were obtained and refined by characteristic and subjective approaches – such as interviews and content analysis. The total number of participants were 28 (13 Slovak, 7 Czech, 8 Lithuanian).

Results: The results of research display that social workers have gender stereotypes about mothers-carers and fathers-breadwinners, which reflects in their preference for usually choosing to involve women to work with, while confronting family matters, rather than men. However, according to them, this choice only seems natural, functional and habitual as per their practical experience in everyday life. Further revelations included a lack of knowledge, education and awareness on the part of social workers in context of gender equality.

Future Research: Presently, the concept of gender equality in the field of social work has not been adequately studied, and thus, as a matter of fact, the subject offers numerous possibilities and a wide scope for empirical research to be carried out. For future purposes, we suggest examining the issue in one of the advanced, post-industrial or 'developed' countries, the public of which does not identify itself with gender stereotypes, much unlike that of the traditional or 'developing' countries. We believe that the rational and sensible way of reflection of 'developed' countries can contribute in the disintegration and breakdown of the deep-rooted stereotypical mindsets of social workers.

UDC Classification: 305-055.1, 305-055.2, **DOI:** <https://doi.org/10.12955/pss.v1.47>

Keywords: Gender. Social Worker. Social Work. Social Role. Stereotype.

¹ Catholic University in Ružomberok, Faculty of Education, Department of Social Work, julia.fricova801@edu.ku.sk

² Catholic University in Ružomberok, Faculty of Education, Department of Social Work, lenka.stefakova@ku.sk

³ Catholic University in Ružomberok, Faculty of Education, Department of Social Work, katarina.kohutova@ku.sk

THE POSITION AND FINANCING OF HIGHER EDUCATION IN SELECTED INTERNATIONAL DOCUMENTS

Zuzana Gálisová¹, Peter Plavčan²

Abstract: This paper presents selected theses on the standing and financing of higher education in three international programming documents on higher education policy: the Bucharest Communiqué of 2012 entitled Making the Most of Our Potential: Consolidating the European Higher Education Area, the Yerevan Communiqué of 2015 and the Paris Communiqué of 2018. The analysis of the standing and financing of higher education includes consideration of the situation in the Slovak Republic.

These three documents consider the standing of higher education in the context of its financing with reference to the function that it fulfils for society in transmitting sophisticated new knowledge to the young generation. There is a visible discrepancy between the expectations of individuals and society as a whole concerning higher education and the sources of its funding. The paper includes an analysis of the changes in stakeholders' views on higher education based on the theses in the three international programming documents on higher education policy.

The paper concludes with a synthesis of the knowledge acquired from the three programming documents on higher education policy, and proposals for adding to them.

UDC Classification: 341.1, **DOI:** <https://doi.org/10.12955/pss.v1.48>

Keywords: Bucharest Communiqué, Yerevan Communiqué, Paris Communiqué, legal regulation, funding of higher education, public, mixed and private goods, impacts of higher education.

¹ Pan-european University, Bratislava, Slovakia. zgalisova@gmail.com

² Danubius University, Sládkovičovo, Slovakia. peter.plavcan@vsdanubius.sk

STUDENTS' PERCEPTIONS ON THEIR ALMA MATER ENVIRONMENTAL SUSTAINABILITY: A COMPARATIVE STUDY IN RUSSIAN AND ARMENIAN ACADEMIC SETTINGS

Elena Gavrilova¹, Lilit Sahakyan², Kira Trostina³, Dinara Tutaeva⁴

Abstract: Environmental sustainability is a constant concern for educational establishments as it has many vital social, academic and financial implications. The aim of this study is to investigate and compare students' perceptions regarding their university's environmental challenges in two geographically distant countries: sampling two economic universities in Russia and Armenia.

A survey related to university's environmental challenges based on 5-point Likert scale was administered to the Bachelor's and Master's students at Plekhanov Russian University of Economics (PRUE), Moscow, Russia and Yerevan Gladzor University (YGU), Yerevan, Armenia. The findings revealed that irrespective of geographical location, there are similar notable differences in students' attitudes towards understanding their own role in their university's environmental well-being. The data shows that the majority of the students strongly understand the concepts of sustainability, sustainable development, eco-friendliness and eco-tourism. The findings reveal that students' age and their education level significantly correlate with their general knowledge of sustainability. Senior students have more responsible attitude towards environmental sustainability of their university. The study established that the majority of the students perceive that environmental awareness can improve their university's facilities, quality and academic development. They understand that they themselves are fully responsible for the university's environmental welfare.

Suggestions by environmentally-conscious students in both universities were summarized in 5Ss: surveying the current state of affairs; sounding out the problems; suggesting improvements; saving university's resources; sharing the experience. The possible causes of environmental problems in the universities have been analysed and their solutions have been recommended. Including formal training in environmental studies in the curricula is suggested. It has also been advised to practice environmental ethics in the universities. The findings of the research can be used for the benefit of all stakeholders and policy makers in promoting universities' eco-conscious image, increasing students' environmental awareness and achieving substantial cost savings.

UDC Classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.49>

Keywords: sustainability, higher education, environment, PRUE, YGU.

¹ Plekhanov Russian University of Economics, Russia, Gavrilova.EA@rea.ru

² Yerevan Gladzor University, Armenia, sahakyanlilit@yahoo.com

³ Plekhanov Russian University of Economics, Russia, Trostina.KV@rea.ru, kira.v.trostina@gmail.com

⁴ Plekhanov Russian University of Economics, Russia Tutaeva.DR@rea.ru

SOCIO-CULTURAL ADAPTATION OF CHILDREN WITH SENSORY DISABILITIES IN THE BULGARIAN SOCIO-CULTURAL ENVIRONMENT

Diyana Georgieva¹

Abstract: The problem of sociocultural adaptation of children with sensory disorders has a proper place in the Bulgarian sociocultural space. This article is devoted to a two-year-long study whose relevance is conditioned by the need to find ways to successfully integrate these children in a modern civilized society. The formulated aim of the study is focused on establishing the level of socio-cultural adaptation of children with impaired auditory and visual modality and the identification of factors that determine its peculiarities. 210 children with sensory impairments from early school, primary school and middle-school age were included, distinguished into the following 4 groups: the ones with impaired hearing (n = 60), deaf children (n = 42), visually impaired children (n = 77), blind children (n = 31); 47 teachers from general and special structures, 153 parents. The methods used are: observation, surveying, interviewing, expert evaluation, analysis of normative documents and experimental materials, statistical analysis of empirical data (correlation, alternative and comparative analysis). From the summarized results, it is concluded that for children with the described model of ontogeny, socio-cultural adaptation is a concept that is represented at different levels. The clearly expressed dominants are the medium and low levels, which implies the partial or complete impossibility of fulfilling the generally accepted socio-cultural functions. In addition to the degree of sensory impairment as factors determining the characteristics of the sociocultural adaptation of children, the following factors were outlined: the professional readiness of teachers, the level of psychological and pedagogical competence of the family, and the attitudes of the society towards children with atypical development.

UDC Classification: 376, **DOI:** <https://doi.org/10.12955/pss.v1.50>

Keywords: socio-cultural adaptation, children with sensory impairments, integration, socio-cultural environment.

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, paskaldi1929@abv.bg

SPECIFIC FEATURES OF INTERPERSONAL COMMUNICATION IN DEAF CHILDREN

Diyana Georgieva¹, Gencho Valchev²

Abstract: Under certain conditions, associated with the presence of early and significant hearing loss, there are some peculiarities observed in children's interpersonal communication. Their knowledge can serve as a guide for overcoming difficulties and maximizing successful communication. The present study is dedicated to identifying the peculiarities of communicative behavior and the type of interpersonal relationships between children with hearing impairments integrated into mainstream schools. The experiment involved 40 children, divided into two groups: control group (hearing children) and experimental group (deaf children). The Diagnostic toolkit contains 3 methodologies: the Raven progressive matrices for determining the level of nonverbal intelligence; a test for evaluation of communicative and initiating abilities, the T. Leary's psycho-diagnostic methodology for establishing interpersonal relationships in the subjects studied. The results of the first test revealed that the intellectual profile of 7-9-year-old students was significantly different from that of their hearing peers. The second test also found differences between the hearing and the deaf, but these were not statistically significant. The Leary test clearly showed that in the process of interpersonal communication, deaf children tend to be authoritarian, selfish, aggressive and suspicious of relationships. At the same time, their hearing peers seek to form an altruistic type of personal relationships.

UDC Classification: 376, **DOI:** <https://doi.org/10.12955/pss.v1.51>

Keywords: communicative ability, interpersonal communication, communicative behavior, deaf children.

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, paskaldi1929@abv.bg

² Trakia University, Faculty of Education, Stara Zagora, Bulgaria, gval@abv.bg

A STUDY ON THE ATTITUDE OF STUDENTS FROM THE NATIONAL SPORTS ACADEMY TO FOREIGN LANGUAGE ACQUISITION IN CONNECTION WITH THEIR FUTURE PROFESSIONAL REALIZATION

Tatiana Hristakieva¹

Abstract: The purpose of the research was to study the attitude of students from the National Sports Academy “V. Levski”, Sofia, to foreign language learning in connection with their future profession as sport specialists, and their interest in using interactive learning techniques in the foreign language courses of the Academy. An enquiry was conducted at the end of the winter term of 2019-2020 academic year with students in the undergraduate programs of the Faculty of Pedagogy and the Faculty of Sport of the National Sports Academy. A questionnaire was used with 12 questions related to the evaluation of students’ foreign language learning needs and the most appropriate sources and strategies for language acquisition. The subjects of the study were 65 students, 44 men and 21 women, at the age of 19-20. The statistical methods used for the research were alternative analysis, variance analysis and Pearson’s chi-squared test (χ^2). The results from the study show that students are mostly interested in the practical application of foreign language learning. They need to develop their productive language skills - oral communicative and writing skills, in order to use the language directly. Computer games and activities in the internet can act as a close to natural environment enhancing language acquisition. Another important conclusion from the survey is that students recognize using foreign languages as an important part of their professional qualification with reference to future career development.

UDC Classification: 81`33, **DOI:** <https://doi.org/10.12955/pss.v1.52>

Keywords: students, attitude, language, learning

¹ National Sports Academy “V. Levski”, Sofia, Bulgaria, hristakieva@yahoo.com

COMMUNICATIVE TECHNIQUES IN FOREIGN LANGUAGE LEARNING IN THE FIELD OF SPORT

Tatiana Hristakieva¹

Abstract: This article presents ideas and models for English language learning, using elements of two communicative learning methods for the specific purposes of sport practice. It is part of a pedagogical experiment, carried out with students from the National Sport Academy “V. Levski”, Sofia, organized into an experimental group (34) and a control group (34). The aim of the experiment was to study the influence of interactive techniques applied in the specialized English language course for sport terminology. The experimental course work involved using elements of different interactive learning methods to teach sport terminology to the experimental group of students for about 30-40 minutes of every academic class of 90 minutes. Initial and final tests of the basic language skills and knowledge of sports terminology were carried out with the experimental and control group of students, in order to establish their language competences before and after the experimental course. The results from the tests were processed with statistical methods – variation analysis and Student’s t-test (dependent and independent samples). The results from the initial and final tests of the two groups have shown that students from the experimental group have improved their language skills, their confidence in using the language and their knowledge of sports terms to a greater extent than the control group. Applying interactive techniques in language learning for the needs of sport specialists leads to better results in their language acquisition.

UDC Classification: 81`33, **DOI:** <https://doi.org/10.12955/pss.v1.53>

Keywords: language, sport, terms

¹ National Sports Academy “V. Levski”, Sofia, Bulgaria, hristakieva@yahoo.com

RELATIONSHIPS BETWEEN COACHES AND ATHLETES IN RHYTHMIC GYMNASTICS

Vesela Ivanova¹, Vasil Dimitrov²

Abstract: Interesting for science in terms of success, are coach-athlete relationship. They are subject of much research and analysis, as the focus is on building strong bonds of trust, respect and support between the two most important sides in the sport.

The aim of our study is to research coach-athlete relationship in rhythmic gymnastics and its influence on the training process. In the investigation, a questionnaire with 24 items was used and the respondents were 14 elite rhythmic gymnasts. The results of the study showed the majority of elite gymnasts have their own opinion about the methods used; they want to be listened to. The biggest differences being observed in the proximity of the individual athletes with the coach.

A good relationship between a coach and an athlete here are not only the key to sports success, but they are a major source of good education, building a value system and character of the gymnasts.

UDC Classification: 37.06, **DOI:** <https://doi.org/10.12955/pss.v1.54>

Keywords: rhythmic gymnastics, coach, athlete, relationship

¹ Faculty of Public health, Health care and Tourism, Wellness Institute Bulgaria, Sofia, Bulgaria, veselaivanovaivanova@yahoo.com

² Sports Management, National Sports Academy "Vassil Levski", Sofia, Bulgaria, messaiiah1331@gmail.com

ACTIVE PE GAMES - A DETERMINANT IN THE DEVELOPMENT OF RELATIONSHIPS IN THE CHILD DIVERSITY GROUP

Veselina Ivanova¹

Abstract: The article focuses on the active PE game, as a functional dominant in the pre-school age of a child when critical changes in his or her social development occur.

The study was conducted by graduate students in settlements with different demographic characteristics (big city - 2 groups, small town - 2 groups, village - 2 groups) with 120 (3-7-year-old children), from 6 different age groups in kindergartens. Kindergartens and kindergarten groups are randomly chosen.

The experimental work uses diagnostic methods of observation, discussion, sociometric techniques (by J. Moreno), mathematical and statistical methods in its course.

The mobility of the group dynamics, the constancy, the communication and the movement of the participants - children from different game unification; the cohesion of the child group, which represents the level in the development of child relationships are monitored.

It is concluded that active PE games during the period of "game dystrophy", which is distinguished by the specificity of the modern socium, are a determinant, an actual alternative in the development of the children's relationships, which in turn create a perspective in the socialization of the children.

UDC Classification: 37.01, **DOI:** <https://doi.org/10.12955/pss.v1.55>

Keywords: game unifications, interaction, pedagogical system, social status, dynamics, cohesion of the group

¹ Veselina Ivanova, Faculty of Education, Trakia University, Stara Zagora, Bulgaria, v_g_chipeva@abv.bg

ATTITUDES OF PRE-SERVICE TEACHERS IN PRIMARY AND PRE-SCHOOL PEDAGOGY TO WORK IN THEIR SPECIAL SUBJECT

Veselina Ivanova¹, Eleonora Mileva²

Abstract: The purpose of the study was to examine the attitudes of pre-service teachers in primary and pre-school pedagogy to work in their subject. 76 pre-service teachers in primary and pre-school pedagogy on the Bachelor's degree from Trakia University in Stara Zagora participated in the research. Half of the respondents had professional experience at primary schools or kindergartens. A special questionnaire was applied, related to the attitudes of the future teachers. The statistical method used for the research was alternative analysis.

Factors influencing the professional realization and career development of the future teachers in the conditions of the dynamically reforming education in Bulgaria were presented. The pre-service teachers in primary and pre-school pedagogy were willing to continue their qualification and education. The future teachers would like to work in their special subject and would not change the profession. Different motives for professional realization of future teachers were established.

UDC Classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.56>

Keywords: attitudes, pre-service teachers, profession, interests, primary and pre-school pedagogy

¹ Veselina Ivanova, Faculty of Education, Trakia University, Stara Zagora, Bulgaria, v_g_chipeva@abv.bg

² Eleonora Mileva, National Sports Academy "Vassil Levski", Sofia, Bulgaria, emileva2002@gmail.com

COMPONENTS OF COOPERATION OF CRISIS INTERVENTION

Michaela Jombíková Janáková¹, Soňa Šrobárová²

Abstract: Introduction: This scientific study provides an insight into the cooperation of individual social services in connection with several methods and techniques of crisis intervention. Given the diversity of the work of crisis intervention, it brings scientific results concerning the of field social workers in social and legal protection of children and social guardianship. It is the field of social workers which cooperate and manage cooperation between individual ministries and activities of individual crisis intervention services.

Aim: The main objective of the research was to investigate the cooperation of social workers with other institutions and the use of diversity techniques in dealing with different types of social problems.

Methods: The research was conducted using a quantitative strategy by distributing a questionnaire of our design to social workers in Slovakia operating within the socio-legal protection and guardianship. The subject of the research was social workers of social protection. The number of respondents whose questionnaire applied to the research objectives was 56. We used statistical analysis for the phase of data processing and evaluation.

Results: In the first research question, we investigated which social problems the respondents are facing in their practice most often. We can conclude that they often encounter problems solutions in the redevelopment of families, tackling crime, divorce, delinquency, and addictions. In the second research question we focused on with which institutions the workers cooperate in solving individual social problems.

Conclusion: Social protection workers in their everyday practice face a wide range of problems. In solving the issues, they cooperate with other professions respectively organizations. Depending on what problems social workers usually deal with, it depends not only on their experience but on their future education.

UDC Classification: 304, DOI: <https://doi.org/10.12955/pss.v1.57>

Keywords: Social worker, social protection and curate

¹ Catholic University of Ruzomberok, Faculty of Education, Ruzomberok, Slovakia, michaela.janakova@ku.sk

² Catholic University of Ruzomberok, Faculty of Education, Ruzomberok, Slovakia, sona.srobarova@ku.sk

EMOTIONAL INTELLIGENCE AS PART OF THE STRATEGIC DEVELOPMENT AND MANAGEMENT STYLE IN THE PRE-HIGH EDUCATIONAL SYSTEM IN ALBANIA

Nada Kallciu¹, Rovenacakaj², Bruna Papa³

Abstract: In today's modern world, emotional intelligence (EI) has a strong connection in the work environment and it is considered to be one of the key factors in the well-functioning of institutions, especially of educational ones.

The main aim of this study is to identify, whether the directors of the schools of the pre-high educational system in Albania are aware of the concept of emotional intelligence, are trained and if they implement it in their leading style, in order to achieve an overall success in schools. The study also aims to identify the differences between new and senior principals in using EI.

The research methodology is quantitative, 183 questionnaires were filled in by teachers in 11 different schools of the pre high educational institutions in Tirana.

The instrument used consists of 40 standard statements that cover all five characteristics of the emotional intelligence: self-awareness, self-control, motivation, empathy and social skills, by analyzing the level of agreement in a 1-5 Likert scale.

The study has shown that principals and teachers of the pre high educational system in Albania have no knowledge on emotional intelligence and as a result they do not implement it. The principals do possess some elements of emotional intelligence as a part of their soft skills, but they are not aware of them and do not use them in increasing the teachers' work satisfaction.

Also, there is no difference in the usage of emotional intelligence between young and senior principals, apart from the fact that the seniors have better developed soft skills. This would help them to come closer to the characteristics of emotional intelligence.

The results of the study imply some recommendations for policy makers, school's principals and mentor teachers in increasing the use of emotional intelligence in the pre high educational system in Albania. The results confirm the necessity to train the principals about the latest news in the field of education, ethics, communication and leadership with a focus on raising leadership within the focus of Emotional Intelligence. The ministry of Education, Sport and Youth should design policies for the professional development of leaders and teachers in accordance with new management strategies such as emotional intelligence.

UDC classification number: 37.07:005.33, **DOI:** <https://doi.org/10.12955/pss.v1.58>

Keywords: emotional intelligence, strategic leadership, pre high educational system, soft skills, teachers.

¹ Faculty of Social Sciences, University of Tirana, Albania, nkallciu@gmail.com

² Faculty of Social Sciences, University of Tirana, Albania, rovenacakaj@live.com

³ Faculty of Economy, University of Tirana, Albania, nickabruna@gmail.com

LONG-TERM UNEMPLOYMENT OF THE RISK GROUPS IN THE SLOVAK LABOUR MARKET

Veronika Ladňáková¹, Martina Špániková²

Abstract: Long-term unemployment is a persistent problem for Slovakia. Despite the number of long-term unemployed people in Slovakia has decreased significantly in recent years, it still presents a high proportion of the total unemployment rate. According to the European Commission Report about Slovakia in 2019, while the long-term unemployment rate fell to 4% on a year-on-year basis, it is still well above the EU average of 2.9%. Although growth is expected in the upcoming years, spending on active labour market policies in Slovakia has been one of the lowest in the EU. The study aims at investigating the current situation of long-term unemployment among risk groups in the labour market in Slovakia and labour market measures taken to curb it. It also examines the consequences of unemployment on the family and to seek solutions for the long-term unemployment in Slovakia. The data has been analyzed by a statistical method and proposes solutions to reduce long-term unemployment in the northern part of Slovakia.

UDC Classification: 305-055.1, 305-055.2, **DOI:** <https://doi.org/10.12955/pss.v1.59>

Keywords: Active Policy, Family, Labour Market, Long-Term Unemployment.

¹ Catholic university in Ružomberok, Faculty of Pedagogy, Department of Social Work,
ladnakova.veronika@gmail.com

² Catholic university in Ružomberok, Faculty of Pedagogy, Department of Social Work,
martina.spanikova@ku.sk

THE SYSTEM OF PRONOMINAL ADDRESS IN LATVIAN: A SOCIOLINGUISTIC ASPECT

Linda Lauze¹

Abstract: This paper represents the study of sociolinguistic variation. The Latvian language has two singular personal pronouns *tu* (T) and *jūs* (V) used for addressing one person but sociolinguistic processes in society reflects that the use of the T pronoun intensifies outside informal speech situations. The aim of the research is to characterize the system of pronominal address as well as to test the steadiness of the V pronoun (*jūs*) in the Latvian language. The empiric part of the research is a qualitative study based on personal interviews, direct observation, and responses in two questionnaires distributed in 1999–2000 and in 2018.

The use of Latvian address forms has been changed in comparison with the Soviet period. For instance, in education. It seems that the high prestige of English and changes of communication style in Latvia are one of the factors making a positive linguistic attitude to the wider use of the T pronoun. However, according to the results of the research, at present Latvians are not ready to reject the pronoun *jūs*. This was concluded in both questionnaires by answers of 85.5 % of respondents in 1999–2000 and 87 % – in 2018. The Latvian personal pronoun *jūs* as a significant part of the address system is no doubt the feature of Latvia's culture.

UDC classification: 811.174, **DOI:** <https://doi.org/10.12955/pss.v1.60>

Keywords: Latvian, pronominal adress, communication, English, sociolinguistics.

¹ Kurzeme Institute of Humanities, Liepāja University, Latvia, linda.lauze@liepu.lv

USAGE OF 3D TECHNOLOGIES IN STEREOMETRY TRAINING

Penio Lebamovski¹, Emiliyan Petkov²

Abstract: StereoMV is a part of a dissertation on a topic "Stereoscopic Training System". The main purpose of the stereo system is to facilitate learning of the concepts of stereometry. The system is the author's and offers a new approach for generating geometric bodies. The boundary method is used for creating the figures, which is based on the method of the boundaries of Isaac Newton and the "Indivisible" of the Italian mathematician Bonaventura Cavalieri. The study shows how by using 3D technologies such as virtual reality and 3D printing, the process of teaching in stereometry classes will be significantly facilitated. The report presents a comparative analysis of the existing and new way of creating a regular polygon. The graphics can be presented in two ways, namely: solid and transparent. The stereo system provides an opportunity for converting from solid to transparent. The 3D model depends on its geometry and appearance. Geometry means mathematical description and the appearance is defined by the: material, texture, light and transparency. After creating the stereometric figure, the system enables it to be converted to .obj file (mesh).

UDC Classification: 37.01, **DOI:** <https://doi.org/10.12955/pss.v1.61>

Keywords: boundary method, polygon, stereometry, stereo system, 3D technology.

¹ St. Cyril and Methodius University of Veliko Tarnovo, Bulgaria, penko_13a@abv.bg

² St. Cyril and Methodius University of Veliko Tarnovo, Bulgaria, petkovemiliyan@gmail.com

POSSIBILITIES OF USING MODERN ACCESS CONTROL SYSTEMS FOR THE PURPOSES OF RESEARCH AND TEACHING AT UNIVERSITY

Filip Lenko¹, Andrej Velas²

Abstract: This article discusses the position of access control systems in the field of intruder systems, its benefits and wide-ranging use in the academic environment. This article points out the potential of access control systems and motivates further research in the field of alarm systems and their integration. As part of the dissertation a project for an access control system was submitted, which enabled the purchase and implementation of an access control system for the teaching laboratory at the Faculty of Security Engineering. The installed access control system serves not only as security for the selected laboratory, but also as a teaching aid, which is used in teaching and thus increases the practical competencies of students. The system is also accessible to students, who can create methodological procedures for its testing and subsequently test them. Such measurements are then used in solving students' final diploma and dissertation theses. Approximately 50 students use the access control system during the academic year. The contribution and aim of the paper is to point out the use of the implemented system in the academic environment and its impact on the improvement of teaching. The conclusion of the article consists of the benefits resulting from the implementation of the access control system at the Faculty of Security Engineering and recommendations for its further use.

UDC Classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.62>

Keywords: access control, education, training, safety.

¹ University of Žilina, Slovakia, Faculty of security engineering, Department of security management, filip.lenko@fbi.uniza.sk

² University of Žilina, Slovakia, Faculty of security engineering, Department of security management, andrej.velas@fbi.uniza.sk

CRISIS OF IDENTITY IN THE CONTEXT OF MACRO-SOCIAL CHANGES

Hermína Mareková¹

Abstract: Identity formation involves all of us. The questions *Who am I?* and *Where do I belong to?* arise quite often in our minds. In the past, an individual was bound by its social status, gender identity and social traditions. In today's modern society, according to some even post-modern society, humans have gained enormous freedom. They can freely build their own identity, they can choose their own way of life, their partner, profession and all of that according to their own criteria. On the one hand, people have acquired enormous freedom. On the other hand, they were given responsibility for their lives. Seeking and creating one's own identity is a lifelong process and, in the context of macro-social changes in society, its complexity creates various kinds of problems and crises.

UDC Classification: 304, **DOI:** <https://doi.org/10.12955/pss.v1.63>

Keywords: identity, crisis, social change, traditions

¹ Danubius University, Sládkovičovo, Slovakia, hermina.marekova@gmail.com

GENDER VIOLENCE AS A POSSIBLE OBJECT OF SOCIALIZATION FOR BOTH SEXES

Hermína Mareková¹

Abstract: There are countless theories and models of socialization. All of these theories agree on one thing: it is a process, during which people pass on and absorb social values and norms, including the norms that apply to gender. Socialization is not a one-way process, in which our children acquire information from our “adult” world. It is rather a two-way process.

Children socialize with each other in everyday interactions – both at home and away from home. In the theories of socialization at school, from the point of view of interaction, the focus is on the microsocial area, i.e. the interaction between subjects. The basic concept of all interactions is therefore communication between the subjects. The individuals have a common set of symbols – speech – at their disposal and are confronted with the expectation of a stabilized behavior. The occurrence of violence in the child's family and in the social environment has significant socializing and educational effects, in a negative sense.

UDC Classification: 304, **DOI:** <https://doi.org/10.12955/pss.v1.64>

Keywords: socialization, gender, violence, children, family.

¹ Danubius University, Sládkovičovo, Slovakia, hermina.marekova@gmail.com

UNESCO AND ITS FINANCIAL STABILITY AFTER MEMBERSHIP CHANGES

Marek Moška¹, Peter Plavčan²

Abstract: The paper presents an overview of the United Nations Educational, Scientific and Cultural Organization (UNESCO) describing the current standing of this important international organization in terms of its global competences and performance of specialized activities in the fields of culture, cultural heritage, education, science, scientific cooperation and other areas based on international documents.

The paper describes the origin and development of UNESCO and the international documents adopted to regulate its standing and operations. It deals in more detail with the historical establishment and development of this global organization and its activities based on international documents such as the United Nations Charter and the UNESCO Constitution. It compares the long-term objectives of the organization concerning respect for human rights, justice and democracy and the arguments of current and former Member States concerning their fulfilment.

The paper also considers the organization's financial mechanism with special regard for the issue of Member States' membership fees. In addition to the current state of UNESCO funding, it considers the possible impacts on its activities following membership changes and the withdrawal of some states from the organization and the subsequent decrease in the available funding for its activities.

UDC Classification: 341.1, **DOI:** <https://doi.org/10.12955/pss.v1.65>

Keywords: UNESCO, Charter of the United Nations, culture and cultural heritage, education, science and scientific cooperation, justice, human rights, law order, international document.

¹ Univerzita sv. Cyrila a Metoda, Trnava, Slovakia, marek_moska@yahoo.com

² Vysoká škola Danubius, Sládkovičovo, Slovakia. peter.plavcan@vsdanubius.sk

ROLES OF SOCIAL WORKERS IN MENTAL HEALTH CARE TEAMS: A SYSTEMATIC REVIEW OF THE LITERATURE

Victor Otieno Okech¹, Štefan Neszméry², Monika Mačkinová³

Abstract: The aim of this review is to determine roles of social workers in mental healthcare teams. This study used a systematic type of literature review in meeting its objective. It involved an online search of articles published in the ProQuest Central database. The search strategy involved retrieving articles using the key words 'Social Worker' AND 'Mental health care' from the ProQuest Thesaurus.

A total of 47 articles were retrieved from the ProQuest database. After screening and conducting an eligibility test, a total of 37 articles were excluded from the study for failing to meet the study inclusion criteria. We included articles that; were published in the English language from 2015 to 2020, outlined roles of social workers in mental healthcare teams, and had verifiable scientific procedures. The remaining 10 articles were subjected to content analysis after fulfilling all inclusion criteria set for the study. From the results of content analysis of the 10 articles, Four (4) articles showed that roles of social workers in mental healthcare teams were those of social support facilitators, three (3) articles showed that their roles were those of social rehabilitation specialists, two (2) articles indicated that they played roles of social reintegration specialists, while one (1) article showed that their roles were those case managers.

We concluded that in mental healthcare teams, social workers play roles of social support facilitators, social rehabilitation therapists, social reintegration specialists, and case managers.

UDC classification: 364.4, **DOI:** <https://doi.org/10.12955/pss.v1.66>

Keywords: Case management, Reintegration, Social support, Social rehabilitation, Social psychiatry

¹ Department of Social Work, Comenius University in Bratislava, Slovakia, okech1@uniba.sk

² Department of Social Work, Comenius University in Bratislava, Slovakia, neszmery@fedu.uniba.sk

³ Department of Social Work, Comenius University in Bratislava, Slovakia, mackinova@fedu.uniba.sk

EMPOWERING THE MARGINALIZED THROUGH COMMUNITY WORK: A LITERATURE REVIEW

Victor Otieno Okech¹, Štefan Neszméry², Monika Mačkinová³

Abstract: Community work is one of the methods of practice that is at the heart of the social work profession. It entails working with communities that have been marginalized. The goal of community work is usually to have communities improve their wellbeing. Without empowerment, marginalized communities remain powerless over circumstances that prevail in their environments.

The main object of this article is to review literature on steps that may be taken to empower communities. In writing this article, we adopted a traditional style of literature review where we obtained our data from the following databases: Springer Link, Wiley Online Library and ProQuest central. We used the following key words to retrieve articles from the online databases: power, community, empowerment and community empowerment. We paired each of the key words using the Boolean operator AND. We observed from the literature that there are three levels of empowerment; psychological, organizational and community levels of empowerment. We also identified three models of that are suitable for use in community work for the purpose of empowering marginalized communities.

From the model developed by Jackson et al. (1989), we concluded that steps that may be taken in empowering the marginalized through community work are; developmental casework, mutual support, issue identification and campaign, community participation and social movements.

UDC classification: 364.4, **DOI:** <https://doi.org/10.12955/pss.v1.67>

Keywords: Community, Power, Empowerment, Community work, Psychological empowerment, Organization

¹ Department of Social Work, Comenius University in Bratislava, Slovakia, okech1@uniba.sk

² Department of Social Work, Comenius University in Bratislava, Slovakia, neszmery@fedu.uniba.sk

³ Department of Social Work, Comenius University in Bratislava, Slovakia, mackinova@fedu.uniba.sk

SMART CITIES AND MODERN VIEWS ON CITIZEN SECURITY

Michal Peňaška¹, Viktor Šoltés², Andrej Veľas³

Abstract: Modern times bring with them modern approaches to the perception of our problems. The perception of security in cities is no exception. The establishment of general indicators is needed to improve the evaluation and comparison of sites. These security indicators can be found in the six basic characteristics that make up a Smart City. This article contains a proposal for an application and a procedure for assessing the impact of projects on the security of citizens. The present proposal uses a system approach method using some specificities of the ISO 31000 standard. The principle of the proposal is that the probability of risk is a priority and we perceive the consequence as the expected increase and decrease in the level of security in cities.

UDC Classification: 352, **DOI:** <https://doi.org/10.12955/pss.v1.68>

Keywords: smart, city, security, safety, cities

¹ University of Zilina, Faculty of Security Engineering, Department of Security Management, michal.penaska@fbi.uniza.sk

² University of Zilina, Faculty of Security Engineering, Department of Security Management, viktor.soltes@fbi.uniza.sk

³ University of Zilina, Faculty of Security Engineering, Head of Department of Security Management, andrej.velas@fbi.uniza.sk

A MODEL FOR BUILDING SOCIAL COMPETENCES IN THE TEACHING OF ENVIRONMENTAL SCIENCE IN THE PRIMARY SCHOOL STAGE OF EDUCATION

Vanya Petrova¹

Abstract: In the new requirements for general education in Bulgaria from 2015 and in the new curricula in Environmental Science in 1st and 2nd grade, social competence is highlighted as an important element of the formative functions of education.

In the presented model for Environmental Science teaching during the primary stage of education, it is built as a complex perspective in the development of the student, passing through the whole content and technology of the pedagogical progress. The most important features of this model are the enhanced emotional and value related side in determining the goals of education and pedagogical technology based on the proactive participation of the student and sustainable tools of interactive methods and techniques.

The model is set in two school kits consisting of an educational textbook and workbook in Environmental Science – for the 1st and 2nd grade which are currently used in Bulgarian Education.

UDC Classification: 37.01. , **DOI:** <https://doi.org/10.12955/pss.v1.69>

Keywords: competence, social competence, curricula in Environmental Science

¹ Faculty of Education, Trakia University, Stara Zagora, Bulgaria, vanja_p@abv.bg

THE COMPARISON OF PIRLS, TIMSS, AND PISA EDUCATIONAL RESULTS IN MEMBER STATES OF THE EUROPEAN UNION

Peter Plavčan¹

Abstract: The PIRLS (Progress in International Reading Literacy Study), TIMSS (Trends in International Mathematics and Science Study), and PISA (Programme for International Student Assessment) have become gold standards for the international comparison of children's performances, when aged 10 and 15 years.

This paper focuses on secondary analysis of basic statistical indicators on reading literacy (PIRLS), as well as the mathematics and scientific literacy (TIMSS) of pupils at 10 years of age, followed by their reading, mathematics and scientific literacy at 15 years of age (PISA). It compares the pupils' main educational results in PIRLS and TIMSS with their PISA results. PIRLS, TIMSS, and PISA help to identify key problems within pupils' educational levels in these selected literacies and create effective educational policy measures.

One aspect of the comparison within the research paper is the aggregate indicator; this is the arithmetic mean of PIRLS and TIMSS results, using pupils' PIRLS results from 2001, 2006, 2011 and 2016, and TIMSS results from 2007, 2011 and 2015. The other aspect of the comparison is the aggregate indicator; which is the arithmetic mean of pupils' PISA results for 2006, 2009, 2012 and 2015. A significant relationship was found to exist between the arithmetic mean of pupils' PIRLS, TIMSS, and PISA results.

Political and professional policy decisions within schooling affect the early years of pupils' school attendance. This has a significant impact on their future education at all levels of schooling. The findings of this paper support a hypothesis regarding the effects of pupils' educational performance and the need for measures to improve education in schools that should be adopted on an ongoing basis.

UDC Classification: 338.2, **DOI:** <https://doi.org/10.12955/pss.v1.70>

Keywords: PIRLS, TIMSS, PISA, reading literacy, mathematical literacy, scientific literacy, education, international comparison, educational results, pupil.

¹ Vysoká škola Danubius, Sládkovičovo, Slovakia. peter.plavcan@vsdanubius.sk

TRUST AMONG CO-PRODUCERS OF PUBLIC SERVICES AND THE IMPACT OF TRANSPARENCY

Andrius Puksas¹

Abstract: The co-production of public services as a process requires parties to cooperate in creating new or improved existing public services and in the delivery of these services. As any other social process, it is expected to be built on trust, benevolence and the balance of interests. Trust between cooperating parties, and between the parties and users of final co-production services is crucial. In other words, trust among stakeholders is expected. The potential benefits of co-production lie in the involvement of qualitatively different stakeholders, who to some extent are interested in the result and have the required resources (human resources, financial, *know-how*, etc.) to contribute. Together with obvious benefits, co-production as a process brings a challenging task to balance the different interests, expectations, demands and maintain trust among co-producers and the users of public services. The paper is based on a conceptual analysis and the analysis of scientific literature; no empirical data was analysed. It provides the definition and the main features of co-production, and analyses the impact of trust among the stakeholders and the role of transparency. Despite the fact that co-production can cover different areas, the article is limited to co-production of public services.

UDC Classification: 351. , **DOI:** <https://doi.org/10.12955/pss.v1.71>

Keywords: co-production; trust; public services; involvement, transparency.

¹ Mykolas Romeris University, Vilnius, Lithuania, andrius_puksas@mruni.eu

INCREASING COMPETENCIES OF SECURITY AND SAFETY MANAGERS IN THE RISK ASSESSMENT PROCESS

Andrej Raffaj¹, Katarína Kampová²

Abstract

Security management is an important part of the overall management of an organization. It aims to protect the health and life of persons, organization property and the environment itself. Achieving this goal, which represents achieving the required level of both security and safety, is undoubtedly dependent on the activities performed by security and safety managers. One of the basic processes affecting the security and safety level in the given organization is a risk assessment process. Based on the results of this process, particular measures are implemented to either avert or reduce the security and safety risks. The KARS method presented in this article is one of the methods applicable to the risk assessment process. The added value over other methods used in practice is that the assessment takes into account the correlation of the assessed risks. The case study presents the application of the KARS for evaluating risks magnitude within a real reference object.

UDC Classification: 376, **DOI:** <https://doi.org/10.12955/pss.v1.72>

Keywords: KARS method, security, assessment

¹ Ing. Andrej Raffaj, University of Žilina, Faculty of Security Engineering, andrej.raffaj@fbi.uniza.sk

² doc. Ing. Katarína Kampová, PhD., University of Žilina, Faculty of Security Engineering, katarina.kampova@fbi.uniza.sk

THE DEVELOPMENT OF A CULTURE OF CHILDREN'S BEHAVIOUR IN PRESCHOOL EDUCATION INSTITUTIONS: ANALYSIS OF PRESCHOOL TEACHERS' EXPERIENCE

Jurgita Smilgienė¹, Erika Masiliauskienė², Jurgita Lenkauskaitė³

Abstract: The Lithuanian society lives in the period of changes in which personal values are influenced by our surroundings. The decline of a culture of behaviour is observed in society and it is increasingly evident in children's and youth's behaviour. Children lose their autonomy, respect for the individual and nation. There is increasingly visible rude communication, social environmental intolerance and this just proves that our younger generation has little culture of behaviour. The earlier you introduce children to the basic conduct of cultural values and their aspirations to develop, the better results will be achieved in the correct behaviour modelling for life in society. For this reason, not only the family, but also preschool, i.e., educators, are responsible for the cultured behaviour of children, education and promotion to be polite, respectful, honest, friendly, etc.

The object of the research – the development of a culture of behaviour of preschool age children. The aim – to reveal how a culture of children's behaviour is developed in preschool.

A study was conducted in preschool institutions of Northern Lithuania. In this case a qualitative research strategy was chosen. The methods of the research: analysis and synthesis of the sources of scientific literature and open-ended written survey of preschool educators. Teachers from 23 preschool institutions participated in the research. Qualitative research data were processed using the method of content analysis. The research revealed what concept the respondents give to the definition of a culture of children's behaviour and what methods they apply in their daily work. The concept of a culture of behaviour from the point of view of teachers is: culture of activity, of communication, of hygiene and nurturing nature. Preschool educators develop a culture of behaviour using traditional methods such as games, conversations, reading, literary and cartoon analysis in their professional activities.

UDC Classification: 37.04, **DOI:** <https://doi.org/10.12955/pss.v1.73>

Keywords: education, children, behavior, culture, preschool, institutions.

¹ Šiauliai University, Institute of Education, Šiauliai, Lithuania, jurgita.smilgiene@gmail.com

² Šiauliai University, Institute of Education, Šiauliai, Lithuania, erika.masiliauskiene@su.lt

³ Šiauliai University, Institute of Education, Šiauliai, Lithuania, jurgita.lenkauskaite@su.lt

RATIONAL EXPERT JUDGEMENT WITHIN THE PROPERTY PROTECTION SYSTEM

Lenka Straková¹, Katarína Kampová², Katarína Mäkká³

Abstract: Property protection is becoming an increasingly important concern not only for companies but also for individuals. Its importance grows not only with increasing crime but also with increasing awareness of people about the protection of their property. This article focuses on one of the issues that we encounter in processes related to the achievement of the required level of property protection and professional judgment. Expert judgment has an irreplaceable position in the whole security process. The article shows the cases in which this judgment has a meaningful significance and the principles to be followed in their use.

This article presents the approach of expert estimates needed within the model of the protection system. This procedure is characterized in five stages and the methods used in this process are also described.

UDC Classification: 658, **DOI:** <https://doi.org/10.12955/pss.v1.74>

Keywords: model of the protection system, protection property system, rational expert judgement.

¹ University of Žilina, Faculty of Security Engineering, Slovakia, lenka.sivakova@fbi.uniza.sk

² University of Žilina, Faculty of Security Engineering, Slovakia, katarina.kampova@fbi.uniza.sk

³ University of Žilina, Faculty of Security Engineering, Slovakia, katarina.makka@fbi.uniza.sk

THE EMOTIONAL-MOTIVATIONAL COMPONENT OF SCHOOL READINESS OF BEGINNING PUPILS

Radka Teleková¹, Tatiana Marcinekova²

Abstract: A child's wish to become a pupil is one of the important identifiers of his / her school readiness. Its assessment at the beginning of schooling provides a picture of the child's initial ability at the beginning of the first year of study in primary school. The focus of this article is the motivational component of school readiness, which has an impact on the individual form of adaptation of beginning pupils. The subject of the research was to find out the presence of individual motives in the structure of the emotional-motivational component of school readiness of children at the beginning of school attendance. The defined component consists of social, cognitive and moral motives, which are interconnected. We were used a questionnaire with ten items in the research activity. The respondents were pupils of the first year of study in selected elementary schools. The results showed that the social, cognitive and moral motive were presented within the emotional-motivational component of school readiness. Overall, there were positive answers to the three motives, which showed a high level of motivation in the research sample. The level of the emotional-motivational component of becoming a pupil is one of the elements ensuring the successful adaptation of the pupil at the beginning of school life. Strengthening the incentive to become a pupil, deepening the desire to learn new things and shaping social skills for existence in the classroom are seen as a tool for developing the motivational sphere of school readiness.

UDC Classification: 37, **DOI:** <https://doi.org/10.12955/pss.v1.76>

Keywords: school readiness, adaptation, motivation, emotional-motivational component,

¹ Constantine the Philosopher University in Nitra, Faculty of Education, Department of Pedagogy, Nitra, Slovakia, radka.telekova@ukf.sk

² Constantine the Philosopher University in Nitra, Faculty of Education, Department of Pedagogy, Nitra, Slovakia, tmarcinekova@ukf.sk

PRACTICAL PRODUCTIVE ACTIVITIES FOR THE DEVELOPMENT OF MATHEMATICAL COMPETENCES

Maria Temnikova¹

Abstract: Development of knowledge, skills and competences for the mathematical quantity of “length” and its measurement units represent important part of the overall education in mathematics for students from Grades 1. – 4.

This research work systematizes some theoretical concepts related to the competences. Based on the analysis of the relevant legislation in force in the Republic of Bulgaria researchers presented the relations between the specific mathematical competences and terminology from the competency Cluster “Measurement”.

The research work is aimed at the development of such a methodology system of work which gives priority to practical productive activities thus facilitating development in primary school students of a higher level of knowledge, skills and competences related to the mathematical quantity of “length” and its measurement units.

The new system of work was applied during the compulsory classes in mathematics in Grades 1. – 4. The research work presents some of the developed and applied options of practical activity.

The researchers studied the objectiveness, the validity and the reliability of the set of tools and means used for doing diagnostics as well as the difficulty and the dividing (separating) strength of the mathematical tasks included in it. The results from the experimental work were statistically processed.

UDC Classification: 37.01, **DOI:** <https://doi.org/10.12955/pss.v1.77>

Keywords: competences, dimensions, measuring units, practical activity

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, mpt66@abv.bg

THE DEVELOPMENT OF WRITTEN COMMUNICATION TRANSVERSAL COMPETENCY IN THE EDUCATION IN MATHEMATICS FOR GRADES 1-4

Maria Temnikova¹

Abstract: Communicational transversal competency represents an important part of the mathematical knowledge, skills and competencies in the process of students' development in Grade 1-4.

The creation and formation of communicational transversal competency helps to put students into an active cognitive position in the course of pedagogical interactions in mathematics classes. Further, creation of communicational transversal competencies develops not only students' analytic – synthetic activity during the process of solving different types of mathematical tasks but also their creative thinking.

This longitudinal research presents some theoretical concepts related to the transversal communicational competency and to its development during the educational process in mathematics in Grade 1-4.

During this empirical study a completely new methodology system of work was developed with the purpose to facilitate development of mathematical knowledge, skills and competencies including the communicational transversal competency. The new system was tested and applied during the compulsory, additional and extended classes in mathematics in Grade 1-4 and consequently was improved after the performance of entry and intermediate diagnostic. Also, this article presents some of the mathematical tasks included in the tests.

The researcher studied the objectiveness, the validity and the reliability of the diagnostic tools developed for the purpose as well as the tasks included in the tests in respect of their difficulty and separating force.

The presented results of the experimental work were processed using mathematics-statistics methods.

UDC Classification: 37.01, **DOI:** <https://doi.org/10.12955/pss.v1.78>

Keywords: communicational transversal competency, methodology system of work

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, mpt66@abv.bg

LIFELONG LEARNING - A FACTOR OF PROFESSIONAL REALIZATION

Mariya Teneva¹, Zlatka Zhelyazkova²

Abstract: The article deals with the problem of full professional realization of the personality based on permanent enrichment of knowledge, skills and competences. The modern man lives in a society defined as a "knowledge society." In order to keep up-to-date in the labor market, where some professions are losing their importance and the need for new ones is created, they are faced with the need to learn throughout their whole life. The article presents the results of an empirical study. The study covers 66 graduate students in a one-year specialization to acquire a new vocational qualification "teacher", who study at the Faculty of Education at Trakia University in Stara Zagora, Bulgaria. The results indicate that the sustainability of the idea of lifelong learning is being considered and realized by representatives of different generations. The age of the respondents varies over a very wide range – from 23 to 56 years of age. The persons surveyed clearly differentiate the strengths and weaknesses of their studies at the university. They express their satisfaction with the theoretical and practical training they have received in the higher education institution. They unambiguously define their motives for acquiring a new professional qualification – from the realized opportunity for a new professional realization, competitiveness in the labour market, desire for change, to the realization of an unfulfilled dream.

UDC Classification: 374, **DOI:** <https://doi.org/10.12955/pss.v1.79>

Keywords: education, lifelong learning, personal self-realization

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, m.s.teneva@abv.bg

² Trakia University, Faculty of Education, Stara Zagora, Bulgaria, zlato6ki@abv.bg

MANAGING THE PROCESS OF ADAPTATION TO THE SCHOOL ENVIRONMENT IN THE CONTEXT OF A MODERN EDUCATIONAL SYSTEM

Venelin Terziev¹

Abstract: The present publication examines the possibilities for more effective implementation of the existing models of the Bulgarian educational system through more active coordination. Emphasis is placed on the need for reform of the institutional framework, the realization of which is possible through the involvement of independent, competent and prepared individuals in the preschool, elementary and lower secondary stage of the educational institutions. Without these specialists, an institutional system would not be able by itself to guarantee the required efficiency. A set of measures has been proposed in this respect to ensure the implementation of the necessary change. The problem of human adaptation to the rapidly changing conditions of modern life is particularly important for modern children who from an early age are raised under conditions of frequent adaptation and re-adaptation to new environments. Each period of transition to a new environment is associated with stress and number of difficulties for the child.

UDC Classification: 37.014.5(497.2), 316.614-053.4/.5(497.2), 364.64:316.614.4/, **DOI:** <https://doi.org/10.12955/pss.v1.80>

Keywords: adaptation, educational system, reform, education, changes.

¹ Georgi Rakovski Military Academy, Sofia, Bulgaria; University of Rousse, Rousse, Bulgaria; Kaneff University Hospital, Rousse, Bulgaria; Russian Academy of Natural History, Moscow, Russia, terziev@skmat.com

THE ELEMENTARY TEACHER AS A MANAGER IN THE CLASSROOM

Venelin Terziev¹

Abstract: The present work seeks to answer what are the appropriate tools for an effective organization for carrying out a creative learning process. A thorough and critical analysis is made on the functions of the teacher, as the latter is considered from the position of a manager in the study (class) room. Emphasis is placed on the study of the process of adaptation to the school environment, as well as the possible consequences of not implementing that same process. The new social role of a child at school is preceded by a series of attractive external stimuli (clothing, knapsack, textbooks, exercise books, school building), which through their family and kindergarten orient them in the forthcoming comprehensive change of their lives. These external stimuli are not enough for a child to adapt quickly to the rights and obligations at school, as well as to the changed evaluation criteria of their activity, mainly learning.

UDC Classification: 37.014.53-053.5 + 316.614-053.5, **DOI:** <https://doi.org/10.12955/pss.v1.81>

Keywords: adaptation, manager, education, classroom, teacher.

¹ Georgi Rakovski Military Academy, Sofia, Bulgaria; University of Rousse, Rousse, Bulgaria; Kaneff University Hospital, Rousse, Bulgaria; Russian Academy of Natural History, Moscow, Russia; terziev@skmat.com

TYPOLOGY OF DYSGRAPHIA ERRORS IN PERFORMING THE WRITING TASK 'PRODUCING YOUR OWN TEXT' BY BILINGUAL PRIMARY-SCHOOL STUDENTS

Gencho Valchev¹, Diyana Georgieva²

Abstract: The article presents the results of a field logopedic study of third- and fourth-grade bilingual students and the research material created by them while carrying out a writing task of producing a text of their own. The aim of the experiment is to analyze the quantitative and qualitative parameters of the dysgraphia errors in bilingual students (ethnic Roma and Turks) at the text level and on this basis to identify their typology and dependence on some linguistic and social factors. For the purposes of the research, a toolkit has been developed that includes groups of methods for the study of the following: the psychosomatic and the academic status, the elementary graphic habits; the phonemic gnosis; writing in different situations; identification and typologization of typographical errors through a criterion system. The results clearly show that the prevailing errors made by the bilinguals are analytic-synthetic. Regarding the other types of errors, significant differences have not been registered. The analysis of the results showed significant differences in terms of gender, ethnicity/language status and type of settlement.

UDC Classification: 376, **DOI:** <https://doi.org/10.12955/pss.v1.82>

Keywords: typographical errors, bilingualism, written text, factors.

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, gval@abv.bg

² Trakia University, Faculty of Education, Stara Zagora, Bulgaria, paskaldi1929@abv.bg

TRANSPORTING OBESE PERSONS USING AN EVACUATION PAD

Tatiana Verešová¹ and Jozef Svetlík²

Abstract: Obesity is not only a medical illness but also a cosmetic problem. Obesity can be defined by the BMI index, which is not very accurate. The ABSI index, which includes BMI, the person's waist circumference, and their height may be used to more accurately determine obesity. Time is very important in saving people's lives, especially in emergencies. The rescue time for obese people is even longer — often much longer — than for other disabled people. This is because more rescuers are needed, problems arise when they have to go through the door or go up and down stairs. For the evacuation of obese people, evacuation pads located under the mattress are often used. Evacuation pads are used, for example, by hospitals or social service homes. Evacuation pads are designed for use by nurses, other emergency staff, or caretakers. In this exercise, four people were used – two nurses and two firemen. To find out the advantages and disadvantages of the evacuation pad, we performed a tactical exercise.

During the tactical exercise, the victim was evacuated by a single nurse, then by two nurses. After that, the victim was rescued by one firefighter and then two firefighters. This research is relevant to aspects of the rescue of immobile obese people with a special evacuation aid. It demonstrates the advantages and disadvantages of an evacuation pad based on actual tactical rescue exercises.

UDC Classification: 364-4, **DOI:** <https://doi.org/10.12955/pss.v1.83>

Keywords: rescue, evacuation pad, obese person

¹ University of Žilina, Faculty of Safety Engineering, Department of Fire Engineering, tatiana.veresova@fbi.uniza.sk

² University of Žilina, Faculty of Safety Engineering, Department of Fire Engineering, jozef.svetlik@fbi.uniza.sk

COMPARATIVE ANALYSIS OF EDUCATIONAL ACHIEVEMENTS OF STUDENTS OF FULL-TIME AND EXTRAMURAL FORMS OF STUDIES, TRAINEES FOR CHILDREN AND ELEMENTARY TEACHERS AT TRAKIA UNIVERSITY, STARA ZAGORA

Donka Zheleva-Terzieva¹

Abstract:

Introduction: The survey carried out covered all students from the second course, specialty "Preschool and Primary School Pedagogy" at the Pedagogical Faculty of Trakia University, Stara Zagora, in full-time and extramural forms of studies.

Purpose of the study: A comparative analysis of academic achievements in the subject "Sport animation in educational environment" of students of full-time and extramural forms of studying for kindergarten and elementary teachers at Thracian University, Stara Zagora.

Methods: A comparative characteristic by age of the method "stem-leaf" with the purpose of reconnaissance (research) analysis of the data was performed. The statistical indicators coefficient of variation, asymmetry, excesses were used. A comparative analysis of the academic achievements of 127 students for the degree of competence after completion of the training course "Sports animation in educational environment" was carried out. The structural differences (relative share, absolute sum, integral coefficient of structural divergence, Spearman and Kendal rank correlation coefficients) between the results of the conducted knowledge verification didactic test and the pedagogical monitoring of the degree of mastered skills and demonstrated relationship at the end of the training were analyzed.

Findings and results: The survey outlined the following summaries: as a whole, the structural differences between the two forms of studies in relation to the acquired knowledge are not great, but the students of full-time form of studies give in the vast majority of cases more correct answers; The "fully mastered skill" assessment is most often greater with students of full-time form of studies compared to extramural form of studies, On skills and relationships that require greater life experience and discipline, the relative share of this assessment is, in more rare cases, greater for the extramural form of studies.

UDC Classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.84>

Keywords: sports animation, competence, students of pedagogical specialties, full-time and extramural forms of studies.

¹ Trakia University, Faculty of Education, donkazeleva@gmail.com

EFFICIENCY OF THE MODEL FOR FORMATION OF PROFESSIONAL- PEDAGOGICAL COMPETENCE FOR SPORTS ANIMATION ACTIVITY

Donka Zheleva-Terzieva¹

Abstract:

Introduction: This article discusses the effectiveness of an educational model for students and postgraduates in acquiring vocational pedagogical competence for sports and animation activities in an educational environment.

Study Objective: The authors are based on the Kirkpatrick assessment model. Presented are results that shall establish the degree of effectiveness of applications at the Pedagogical Faculty of Trakia University, Stara Zagora of the competency model of three indicators – degree of satisfaction from the training program, degree of acquiring of competence and learning outcomes.

Methods: The methods of pedagogical research used are: questionnaire, didactic test, pedagogical observation, expert evaluation.

Results: The results prove the effectiveness of the developed didactical model.

UDC Classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.85>

Keywords: sports animation, pedagogical model, model performance.

¹ Trakia University, Faculty of Education, donkazeleva@gmail.com

CLASSROOM MANAGEMENT AND SUSTAINING DISCIPLINE IN AN ENGLISH-LEARNING CLASS

Zlatka Zhelyazkova¹, Mariya Teneva²

Abstract: The lack of respectful behaviour towards teachers and classmates is considered to be the main problem of Bulgarian schools today. A great number of public school teachers have considered leaving the job or have already quit because of students' misbehaviour and their inability to cope with discipline problems. English language teachers are not an exception in this respect despite the popular view that there is a great motivation for learning foreign languages. The focus of the article is the discipline which is necessary to be created, worked upon and maintained in the classroom throughout the whole of the school year. The study was aimed at defining the aspects of the problem with discipline, collect data regarding the existing situation with classroom management and suggest some strategies and techniques for developing and keeping an effective practice. The results confirmed the theoretical concept that the teacher's goal is not to restore the order through respective reactions to misbehaviour but to organize a system of classroom activities and perform a study that would lead to the prevention of the disruptive actions in the first place.

Research methods: content analysis, pedagogical research, scientific enquiry, percent analysis.

Scope and results of the study: The study was performed with pedagogical students in the specialty Primary School Education with a Foreign Language at the Faculty of Education at Trakia University, Stara Zagora, Bulgaria. The results point at a desperate need for change in the practice of language teaching in the country so as to face adequately the new generations of students with their attitudes and characteristics.

UDC Classification: 378, **DOI:** <https://doi.org/10.12955/pss.v1.86>

Keywords: education, pedagogical modelling, motivation for studying.

¹ Trakia University, Faculty of Education, Stara Zagora, Bulgaria, zlato6ki@abv.bg

² Trakia University, Faculty, Stara Zagora, Bulgaria, m.s.teneva@abv.bg

DEGREE OF DIGITAL TECHNOLOGICAL INTEGRATION IN THE BULGARIAN SECONDARY TECHNOLOGICAL EDUCATION

Lyubima Zoneva¹

Abstract: Global informatization is one of the dominant trends in contemporary social reality. Digital information and communication technologies have enormous innovation potential for the overall modernization and transformation of education and the enrichment of pedagogical sciences. Realizing this potential requires technologies to be fully integrated into educational practice. A high degree of integration is a prerequisite for the implementation of constructivism, increasing autonomy, personal responsibility of learners and the opportunity for personalized learning.

Digital technological integration is a progressive change of education to a degree of transformation. In the process of gradual merging of information and communication and pedagogical technologies, innovative pedagogical practices are created, and they cannot be realized without modern technological means. The characteristics of the methods of teaching and learning with digital technologies determine different degrees of integration which are entry, adoption, adaptation, infusion, and transformation.

The current features of the applied methods for using Information Communication Technology (ICT) in the Bulgarian secondary education in technology, and entrepreneurship (grades 5-7) were studied by surveying 127 pedagogues teaching this subject. A questionnaire is attached examining the goals, frequency use of digital tools in the educational process, and the applied management decisions for choosing the digital tools and working with them. The analysis of the obtained data showed that ICT was used, but the degree of integration was low and corresponded to the initial levels of entry and initial adoption of the integration process. In isolated cases, lessons were held according to how students performed in activities specific to their level of adaptation.

UDC Classification: 37.04, **DOI:** <https://doi.org/10.12955/pss.v1.87>

Keywords: integration, digitalization, technology education, information and communication technologies, learning, teaching

¹ Faculty of Engineering, Department of Technical Education and Professional Training, South-West University "Neofit Rilski" Blagoevgrad, Bulgaria, zoneva@swu.bg

Section 3: Medicine and Pharmacy

PHYTOCHEMICAL STUDY OF ENDEMIC SPECIES HELLEBORUS CAUCASICUS, HELLEBORUS ABCHASICUS AND FICARIA POPOVII SPREAD IN SOUTHERN COLCHIS

Medea Beridze¹, Aleko Kalandia², Indira Japaridze³, Maia Vanidze⁴,
Natela Varshanidze⁵, Nazi Turmanidze⁶, Ketevan Dolidze⁷, Inga Diasamidze⁸,
Eteri Jakeli⁹

Abstract: There are 176 endemic plants spread in southern Colchis, of which 45 can be used for some medical treatments. The bioecology and detailed phytochemical content of some medicinal plant populations have not been studied so far.

The research objective is to study the phytochemical content of endemic species of *Helleborus caucasicus*, *Helleborus abchasicus* and *Ficaria popovii* spread in southern Colchis.

The research method for the phytochemical content included separation analysis, which was performed by using UPLC-MS (Waters Acquity QDa detector).

Three Steroidal glycosides were isolated from the MeOH extract of the plants of *Helleborus caucasicus* and *Helleborus abchasicus*: Hellebrigenin-D-glucose, 20 – Hydroxyecdysone and Hydroxyecdysone – 3 glucoside. Two saponins (Hederagenin 3-O - α -L-arabino pyranoside, Hederagenin 28-O-[α -L-rhamno-pyranosyl(1 \rightarrow 4)- β -D-glucopyranosyl-(1 \rightarrow 6)] β -D-lucopyranoside) and four flavonoids (kaempferol 3-O- β -D- (6''- α -L-rhamnopyranosyl)-glucopyranoside (nicotiflorin), apigenin 8-C- β -D-glucopyranoside (vitexin), luteolin 8-C- β -D-glucopyranoside (orientin), quercetin 3-O-rutinoside) were isolated from the tubers and flowers of *Ficaria Popovii*.

Three Steroidal glycosides and Hydroxyecdysone -3 glucoside were isolated from the MeOH extract of *Helleborus caucasicus*. In addition, two saponins and four flavonoids were isolated from the tubers and leaves of *Ficaria Popovii*.

UDC Classification: 577, **DOI:** <https://doi.org/10.12955/pmp.v1.89>

Keywords: Phytochemistry, UPLC-MS, *Ficaria Popovii*, *Helleborus caucasicus*, *Helleborus abchasicus*

¹ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of Biology, Batumi, Georgia, medeaberidze89@mail.ru

² Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of chemistry, Batumi, Georgia, a.kalandia@bsu.edu.ge

³ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of chemistry, Batumi, Georgia, indira.djafaridze@bsu.edu.ge

⁴ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of chemistry, Batumi, Georgia, maia.vanidze@bsu.edu.ge

⁵ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of Biology, Batumi, Georgia, natela.varshanidze@gmail.com

⁶ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of Biology, Batumi, Georgia, turmanidze.nazi@bsu.edu.ge

⁷ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of Biology, Batumi, Georgia, diasamidze.inga@bsu.edu.ge

⁸ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of Biology, Batumi, Georgia, ketodolidze@yahoo.com

⁹ Batumi Shota Rustaveli State University, Faculty of Natural Sciences and Health Care, Department of Pharmacy, Batumi, Georgia, eteri_jakeli@yahoo.com

CHANGES IN THE INTENSITY OF FREE RADICAL LIPID OXIDATION IN PATIENTS WITH BRONCHIAL ASTHMA WITH CONCOMITANT CHRONIC NON-CALCULOUS CHOLECYSTITIS

**Tetiana Dudka¹, Olha Mandryk², Yana Toderika³, Ivanna Rachynska⁴,
Zakhar Marfiuk⁵**

Abstract:

INTRODUCTION: The incidence rate of chronic non-calculous cholecystitis (CNCC) in the population is 35-38%, and in elderly patients it reaches to 65-72%. Free radical lipid oxidation (FRLO) plays a significant role in the development and progression of bronchial asthma (BA). The initiators of FRLO excessive activation can be the following: hypoxia, inflammation, immune damage to membranes and the imperfection of the antioxidant defense.

OBJECTIVE: To compare the intensity of FRLO processes in patients with BA and comorbid CNCC, and patients with BA and CNCC each without any comorbidities..

METHODS: The study was performed on 92 patients: 30 patients with BA (group 1), 30 patients with BA and comorbid CNCC (group 2), and 32 patients with CNCC (group 3). The control group consisted of 30 practically healthy persons (PHP). The number of compounds with isolated double bonds (IDB), diene conjugates (DC), ketodienes and conjugated trienes (K/CT), and malonic aldehyde (MA) in erythrocytes and blood plasma were determined.

RESULTS: In groups 1, 2, and 3, the content of IDB was higher in comparison with PHP by 1.4, 1.7, and 1.6 times respectively. In group 1, plasma K/CT was 12.0% higher, and DC was 1.5 times higher compared to the PHP group. In group 2, DC and K/CT were higher by 1.7 times and by 21.7% as compared with PHP. In group 3, plasma MA and red blood cell MA were higher by 18.0% and 29.8%. The highest content of plasma MA and red blood cell MA in group 2 of patients was 69.8% and 54.3% respectively. In group 3, plasma MA was 34.7% higher, and red blood cell MA was 44.4% higher compared to the normal values.

CONCLUSIONS: Intensification of FRLO processes leads to disruption of microcirculation and metabolic processes in the bronchial epithelium, supports local inflammatory process in the gallbladder and bronchi and promotes inhibition of tissue respiration with increased tissue hypoxia, which, in turn, leads to the progression of broncho-obstruction.

UDC Classification: 616.248, **DOI:** <https://doi.org/10.12955/pmp.v1.90>

Keywords: Chronic non-calculous cholecystitis, bronchial asthma, free radical lipid oxidation.

¹ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, tetyana.dudka@bsmu.edu.ua

² Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, mandryk.olha@bsmu.edu.ua

³ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, ianusca12@gmail.com

⁴ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, sasoring56@gmail.com

⁵ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, zmarfuk98@gmail.com

LABORATORY DIAGNOSTIC CRITERIA OF RENAL IMPAIRMENT IN PREMATURE NEWBORNS WITH SEVERE PERINATAL PATHOLOGY

Alina Phrunza¹, Yuliya Hodovanets², Anastasiya Babintseva³, Nataliya Kovtyuk⁴,
Olena Makarova⁵

Abstract:

Introduction: Critically ill neonates are at high risk of developing renal impairment (RI), including acute kidney injury (AKI), which is associated with short- and long-term pathological outcomes and increased mortality. The incidence of acute kidney injury varied by gestational age (GA) group.

Aim: Identify laboratory diagnostic criteria of RI in premature newborns (PNs) with different GA who had severe heterogeneous perinatal pathology.

Methods: The study was a prospective cohort of patients admitted electively to the III level Neonatal Intensive Care Unit at the Clinical Maternity Hospital 2 (Chernivtsi, Ukraine) between December 2015 and January 2018. One hundred sixty three PNs were treated at the hospital, from which a total of 68 patients were recruited into the study. Inclusion criteria: the GA is more than 24 weeks and less than 37 weeks; birth body weight is more than 500 g and less than 2500 g; presence of clinical signs of severe perinatal pathology. The severity of the perinatal pathology was classified on the basis of the neonatal Therapeutic Intervention Scoring System. The PNs were divided into three groups according to the GA: Group I consisted of 25 newborns born at the GA of 24-31 weeks, Group II – 25 newborns born at the GA 32-33 weeks, Group III – 18 newborns were born in a GA of 34-36 weeks.

The levels of sodium, potassium, calcium and chlorine, alanine aminopeptidase, and aspartate aminopeptidase were measured in serum. The levels of creatinine and urea were measured in serum and urine. The concentration of total protein, albumin, α 1-microglobulin, and β 2-microglobulin was measured in urine.

Findings and results: All PNs had signs of severe perinatal pathology and a neonatal Therapeutic Intervention Scoring System score of 10 or higher during the early neonatal period. There was no statistically significant difference in most serum biochemical parameters between groups of the study, excluding the level of serum chlorine. Our results demonstrated no significant difference in levels of urinary total protein and albumin between groups of the study, but showed a progressive increase the level of urinary creatinine and urea with increasing GA. The maximum level of urinary β 2-microglobulin was found in "Late-Preterm" newborns who were born at 34-36 weeks, the minimal level of urinary α 1-microglobulin was detected in patients with GA 32-33 weeks.

Conclusions: Our results demonstrated that most PNs with severe perinatal pathology have some aspects of impaired tubular and glomerular functions. This is evidenced by changes in urinary new biomarkers. We found direct correlations between GA and serum creatinine ($r=0.31$, $p<0.05$), urinary creatinine ($r=0.40$, $p<0.05$), urinary α 1-microglobulin ($r=0.37$, $p<0.05$), and urinary β 2-microglobulin ($r=0.51$, $p<0.05$). Longer longitudinal cohort studies on PNs are required to determine the prognostic and diagnostic criteria of RI in these patients.

UDC Classification: 616.61-008.64-053.12:618.3-06]-071-076, **DOI:** <https://doi.org/10.12955/pmp.v1.91>

Keywords: newborns; prematurity; renal impairment.

¹ Bukovinian State Medical University, Department of Pediatric, Neonatology and Perinatal Medicine, Chernivtsi, Ukraine, frunzaalina@ukr.net

² Bukovinian State Medical University, Department of Pediatric, Neonatology and Perinatal Medicine, Chernivtsi, Ukraine, godovanec.julia@bsmu.edu.ua

³ Bukovinian State Medical University, Department of Pediatrics, Neonatology and Perinatal Medicine, Chernivtsi, Ukraine, babintseva@bsmu.edu.ua

⁴ Bukovinian State Medical University, Department of Pediatric, Neonatology and Perinatal Medicine, nkovtyuk@gmail.com

⁵ Bukovinian State Medical University, Department of Nursing and Higher Nursing Education, Chernivtsi, Ukraine, makarova@bsmu.edu.ua

METHODS TO DETERMINE COMPLEX DEGREES OF MUTUAL ANISOTROPY FOR THE DIFFERENTIATION OF HEMORRHAGES IN THE HUMAN BRAIN SUBSTANCE RESULTING FROM TRAUMATIC AND NON-TRAUMATIC GENESIS

Marta Garazdiuk¹, Viktor Bachynskiy², Olena Nechytailo³, Oleksandr Garazdiuk⁴,
Svitlana Malanchuk⁵

Abstract: An issue that is often debated in forensic traumatology is the differential diagnosis of hemorrhages into the human brain substance (HBS) of traumatic and non-traumatic genesis.

Objectives. This study aims to identify new criteria for objective forensic differentiation of hemorrhages of traumatic origin, cerebral infarction of ischemic and hemorrhagic genesis by using the method of complex degree of mutual anisotropy. For this study native sections of HBS from 125 corpses were used in the case of: death from coronary heart disease - 35 (28%) of native sections (Group 1 - control); hemorrhages of traumatic genesis - 30 (24%) sections (Group 2); ischemic cerebral infarction - 30 (24%) native sections (Group 3); and hemorrhages of non-traumatic genesis - 30 (24%) native sections (Group 4).

Results. The statistical moments of the third and fourth orders, which characterize the asymmetry and excess of the complex degree of mutual anisotropy module size distributions, the strength of the method of polarization-correlation microscopy in the differentiation of the samples of the histological sections of the brain of control and experimental groups reached a good level — 87%-90%.

Conclusion. The method of complex degree of mutual anisotropy allows differentiating with great precision the genesis of hemorrhage into the substance of the brain.

UDC classification: 616.1, **DOI:** <https://doi.org/10.12955/pmp.v1.92>

Keywords: ischemic cerebral infarction; hemorrhages of traumatic and non-traumatic genesis, forensic medicine.

¹ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Department of Forensic Medicine and Medical Law, Chernivtsi, Ukraine, m.garazdiuk@gmail.com

² Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Department of Forensic Medicine and Medical Law, Chernivtsi, Ukraine, sudmed@bsmu.edu.ua

³ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Department of Anesthesiology and Reanimatology, Chernivtsi, Ukraine, olena.nechytailo@bsmu.edu.ua

⁴ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Internal Medicine and Infectious Diseases Department, Chernivtsi, Ukraine, olexandr.harazdiuk@gmail.com

⁵ Municipal Non-Commercial Enterprise “Clinical Maternity Hospital # 1” of Chernivtsi City Council, s.malanchuk@gmail.com

MYOCARDIAL INFARCTION AT YOUNG ADULTS – RISK FACTORS AND MANAGEMENT

Irinka Hristova¹, Despina Georgieva², Krasimir Trifonov³, Ivo Belkolev⁴,
Vladimir Danov⁵

Abstract:

Introduction: Generally, the myocardial infarction is far more common among the population which is over 45 years. However, on rare occasion it can be seen amongst the younger population such as the above discussed case.

Objective: The report from the case of this overview shows an acute myocardial infarction in a young 28-year-old man, due to thrombotic occlusion that has nothing to do with coagulation problems.

Methods: The Coronary Angiography is of paramount importance when it comes to reaching a correct diagnosis, and by extension, treatments for such cases. Moreover, the detailed clinical case history further aided in determining the key risk factors.

Results: When it ensues in younger age, the myocardial infarction is associated with significant morbidity, psychological effects and financial limits to the individual and his or her family.

Conclusions: In the examined case we described the contemporary management of a myocardial infarction event, wherein the patient was advised to stop smoking, form a consistent regular exercising physical activity regime, put more conscious effort into having a healthy diet, and reduce stress levels as much as possible.

UDC Classification: 616.1, **DOI:** <https://doi.org/10.12955/pmp.v1.93>

Keywords: Heart Attack; Cardiovascular Risk Factors; Hypercholesterolemia; Interventional Cardiology;

¹ Ruse University „Angel Kanchev“, Ruse, Bulgaria; Department of Health care, Faculty of Public health and Health care; 8 “Studentska” str.; E-mail: ihristova@uni-ruse.bg

² Ruse University „Angel Kanchev“, Ruse, Bulgaria; Department of Health care, Faculty of Public health and Health care; 8 “Studentska” str.; E-mail: dpgeorgieva@uni-ruse.bg

³ UMHAT “Kanev” Ruse, Bulgaria; 2 “Nezavisimost” str.; E-mail: krasimir.trifonov@gmail.com

⁴ UMHAT “Kanev” Ruse, Bulgaria; 2 “Nezavisimost” str.; E-mail: i.belkolev.vn@cardiacinstitute.bg

⁵ Ruse University „Angel Kanchev“, Ruse, Bulgaria; Department of Health care, Faculty of Public health and Health care; 8 “Studentska” str.; E-mail: dherzchirurgie@gmail.com

METABOLIC AND ADIPOCYTOKINE PRECONDITIONS FOR PROGRESSION OF NON-ALCOHOLIC STEATOHEPATITIS IN OBESITY PATIENTS DUE TO COMORBIDITY WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Olha Hryniuk¹, Oksana Khukhlina², Oksana Liakhovych³,
Viktoriia Hutsuliak⁴, Snizhana Hnatkovich⁵

Abstract:

The increasing prevalence of chronic obstructive pulmonary disease (COPD) and nonalcoholic steatohepatitis (NASH) is a problem of high importance.

Objective: to determine the state of blood lipid spectrum, glycemia, the degree of insulin resistance and their regulation by adipose tissue hormones in NASH patients against the background of obesity, depending on comorbidity with COPD.

Methods. 130 patients were examined, including 35 NASH patients with obesity of the 1st stage (1 group), 60 NASH patients with obesity of the 1st stage and COPD 2-3 D (group 2), and 35 patients with COPD 2-3 D (group 3).

Results: Blood lipid concentration in patients of the 1st and the 2nd groups exceeded the norm by 29.5% and 39.8% respectively ($p < 0.05$). In the 3rd group - by 14.9% ($p < 0.05$). The content of total cholesterol in the blood also points out its probable increase by 36.3%, 45.7% and 14.9% ($p < 0.05$) in comparison with practically healthy individuals (PHI) in patients of the 1st, 2nd and 3rd groups. A probable increase in the concentration of triacylglycerols (TG) in blood (1.9 and 2.2 times, respectively ($p < 0.05$)) was recorded in the 1st and 2nd groups of patients, while in patients of the 3rd group the changes were quite significant (1.6 times increase, $p < 0.05$).

Conclusions. Comorbidity of COPD in obese patients and NASH is an additional, powerful-inducing factor of lipid distress syndrome with significantly higher increase (compared with NASH without lung pathology) TG in blood, which form the basis of liver steatosis, total cholesterol, low density lipoproteins, with significantly higher decrease high density lipoproteins, the atherogenic index, which are accompanied by hyperleptinemia, adiponectin deficiency, correlate with the degree of liver steatosis, fibrosis index, cytolytic activity, cholestatic, mesenchymal-inflammatory syndromes and are interrelated with hyperleptinemia, hypoadiponectinemia.

UDC Classification: 616.36, **DOI:** <https://doi.org/10.12955/pmp.v1.94>

Keywords: nonalcoholic steatohepatitis, chronic obstructive pulmonary disease, obesity

¹ HSEI of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases, hryniuk.olha@gmail.com

² HSEI of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases, oksanakhukhlina@gmail.com

³ HSEI of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases, ksiusuk@gmail.com

⁴ HSEI of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, hutsuliak@ukr.net

⁵ HSEI of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, snizhana.gn@ukr.net

BURNOUT SYNDROME IN BULGARIAN PHARMACISTS – PILOT STUDY

Mariya Ivanova¹, Anna Todorova², Lora Georgieva³

Abstract:

Introduction: Work in the field of healthcare is accompanied by considerable emotional tension. Pharmacists are at risk of professional burnout, but so far, there is very little scientific research in this professional group in Bulgaria.

Objective: To study the presence of Burnout Syndrome among Bulgarian pharmacists and perform an analysis according to the demographic characteristics of respondents.

Material and Methods: A pilot study was conducted for the presence of Burnout Syndrome among 142 pharmacists in Varna, Bulgaria, working in different areas of the pharmaceutical sector: pharmacies for public services, hospital pharmacies, pharmaceutical companies, higher education institution. The information was collected using an anonymous questionnaire that included the specialized Maslach Burnout Inventory (MBI) tool to examine professional burnout according to three subscales: emotional exhaustion, depersonalisation and personal accomplishment.

Results: Higher levels of emotional exhaustion and depersonalisation were found in male respondents in comparison to women, while the values between the two genders were almost similar according to the professional achievement subscale. The most vulnerable group was the male group at the age of 31-40. Pharmacists over the age of 50 had lower levels of burnout as they had developed good habits to deal with stress.

Conclusion: Gaining professional experience in pharmacists is associated with an increase in the levels of professional burnout. High levels of depersonalisation are a prerequisite for worse quality of pharmaceutical care.

UDC Classification: 615.1, **DOI:** <https://doi.org/10.12955/pmp.v1.95>

Keywords: burnout, pharmaceutical sector, pharmacists, demographic characteristics

¹ Department of Organization and Economics of Pharmacy, Faculty of Pharmacy, Medical University of Varna, Bulgaria, M.M.Ivanova@mu-varna.bg

² Department of Organization and Economics of Pharmacy, Faculty of Pharmacy, Medical University of Varna, Bulgaria, anna.todorova@mu-varna.bg

³ Department of Social Medicine and Healthcare Organization, Faculty of Public Health, Medical University of Varna, Bulgaria, georgieva_1@mu-varna.bg

ESTIMATION OF THE TIME SINCE DEATH BY USING THE POLARIZATION MULLER-MATRIX MICROSCOPY OF BIOLOGICAL TISSUE IN CASES OF ALCOHOL AND CARBON MONOXIDE POISONING

Ihor Ivaskevich¹, Oleh Vanchuliak², Viktor Bachynskiy³, Sviatoslava Yurniuk⁴

Abstract:

Introduction: This paper aims to investigate and substantiate the information capabilities of the objective method of azimuthal-invariant polarization Müller-matrix microscopy of histological sections of biological tissues (BT) in the diagnosis of time since death (TSD) in alcohol and monoxide poisoning.

Objectives: The purpose of the study was to evaluate the diagnostic capabilities of the azimuthal-invariant Muller-matrix polarimetry technique of the polycrystalline constituent of BT and human body fluids in determining the TSD in cases of alcohol and carbon monoxide poisoning.

Results: A comprehensive experimental study of the diagnostic efficiency of the azimuthal-invariant Muller-matrix polarimetric microscopy of the polycrystalline component of histological sections of the brain, myocardium, adrenal glands, liver, and polycrystalline blood films from dead persons for the diagnosis of TSD in cases of alcohol and carbon monoxide poisoning. A sensitivity range of 24 hours was determined using the method of the azimuthal-invariant Muller-matrix polarimetric microscopy of the polycrystalline component of histological sections of the myocardium for the diagnosis of TSD in cases of alcohol and carbon monoxide poisoning.

Conclusion: The results showed the effectiveness of the studied methodology and the prospect of further research in this direction.

UDC Classification: 616-091, **DOI:** <https://doi.org/10.12955/pmp.v1.96>

Keywords: Post-mortem interval, carbon monoxide poisoning, alcohol poisoning, polarization.

¹ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Forensic Medicine and Medical Law Department, Chernivtsi, Ukraine, liquiritia.s@gmail.com

² Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Forensic Medicine and Medical Law Department, Chernivtsi, Ukraine

³ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Forensic Medicine and Medical Law Department, Chernivtsi, Ukraine

⁴ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Pharmacy Department, Chernivtsi, Ukraine

INVESTIGATION OF EXTERNAL RESPIRATORY FUNCTION AND HEMOSTASIS SYSTEM'S STATUS IN PATIENTS WITH CHRONIC OBSTRUCTIVE LUNG DISEASE WITH CONCOMITANT CHRONIC PANCREATITIS

Yulia Karlychuk¹, Inna Dudka², Vitaliy Smandych³,
Taisiia Krasnova⁴, Petro Varkhomiy⁵

Abstract:

Introduction: It can be assumed that the comorbidity course of chronic obstructive pulmonary disease (COPD) and chronic pancreatitis (CP) can enhance the clinical symptoms of both diseases and lead to frequent relapses of the pathological process due to changes in the proteolysis intensity of high and low molecular weight plasma proteins and the state of the hemocoagulation.

Objective: To establish the features of hemocoagulation and proteolytic hemostasis at COPD with concomitant CP.

Methods: 120 patients with COPD and CP were examined. The function of external respiration, total coagulation potential of blood plasma, the state of enzymatic and non-enzymatic fibrinolysis, total fibrinolytic activity were investigated.

Results: CP contributes to the development of broncho-obstructive syndrome, and the maximum indicators of reduction of FEV1 relative to the proper values are observed in patients with a comorbid course of COPD and CP. Reducing the intensity of collagenolysis in patients of groups 1-2 contributed to the development of diffuse pulmonary fibrosis in response to chronic inflammation. The imbalanced increase in the intensity of proteolysis due to reduced expression of its inhibitors in COPD patients with CP led to progressive destruction of the cell membranes of alveolocytes, acinar epithelium of pancreas and epithelium of the bronchial mucosa, acceleration of their apoptosis and development of desquamation, atrophic changes, metaplasia, and the like. The above factors are active as inducers of inflammation, and the formation of pulmonary fibrosis and fibrosis of the pancreas.

Conclusions: In COPD patients with accompanying CP are an increase in the lysis rate of low and high molecular weight proteins and a decrease in blood collagenolytic activity on the background of a significant imbalance in the activity of plasma proteinase inhibitors. Defined suppression of the activity of the anti-coagulation system factors and enzymatic, Hageman-factor-dependent fibrinolysis indicates the formation of hypercoagulation syndrome in these patients.

UDC Classification: 612.2, **DOI:** <https://doi.org/10.12955/pmp.v1.97>

Keywords: Chronic obstructive pulmonary disease, chronic pancreatitis, fibrinolysis, azoalbumin.

¹ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, j.m.karlychuk@gmail.com

² Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, dudka.inna@bsmu.edu.ua

³ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, smandych_vitaliy@bsmu.edu.ua

⁴ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, 2005.mf4.15@bsmu.edu.ua

⁵ Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine, pet.varkh1997@gmail.com

ATTITUDES TOWARDS THE USE OF MOBILE HEALTH APPLICATIONS IN BULGARIA

Kristina Kilova¹, Desislava Bakova², Antonia Yaneva³, Vanina Mihaylova⁴

Abstract

Background: The increasing use of mobile phones has offered an opportunity to improve the quality of health services, secure the accessibility of healthcare systems for a larger population and support patients in effective management of their health/chronic conditions.

Main Goal: The primary focus of the study in hand is to explore the different attitudes towards the use of mHealth in Bulgaria and to examine the extensive use of mobile health applications for the supervision, prevention and containment of various socially relevant diseases, including the promotion of healthy lifestyles.

Materials and methods: An online survey was conducted in the period between July 2019 and February 2020. Amongst the 976 people that were interviewed, 591 (60.6%) were females and 385 (39.4%) were males. The mean age of the respondents was 43.25 ± 0.755 . A unique questionnaire was prepared for the collection of information regarding the usage of mobile health applications. Statistical analyses were carried out with the help of IBM SPSS Statistics, version 23. MS Excel 2016 was used for the graphical representation of the results.

Results: 89% of the participants possessed a mobile phone and an approximate 84% of them used mHealth applications. Besides this, the results suggested a considerable statistical difference in the respondents' attitudes, in terms of their gender, where the deviation was in favour of female respondents. Additionally, findings revealed another statistical difference on the basis of their age and level of education. Furthermore, a huge majority claimed that they generally used these types of applications for monitoring their blood pressure or pulse.

Conclusion: The outcome of the study was that a significant number of respondents were already using or tended to use smartphones and various applications, including health ones. We expect that the results of this study will provide evidence of the essentiality of mobile health applications to be developed in Bulgaria. This is crucial for patients as this technology has the potential to open up several new possibilities for treatments and observations of diverse socially significant diseases.

UDC Classification: 606:628, **DOI:** <https://doi.org/10.12955/pmp.v1.98>

Keywords: mHealth, mobile health applications, telemedicine.

¹ Medical University of Plovdiv, Bulgaria: Dept. "Medical Informatics, Biostatistics and E-Learning", Faculty of Public Health, k_kilova@yahoo.com

² Medical University of Plovdiv, Bulgaria: Dept. "Health Care Management", Faculty of Public Health, desislavabakova@abv.bg

³ Medical University of Plovdiv, Bulgaria: Dept. "Medical Informatics, Biostatistics and E-Learning", Faculty of Public Health, antoniya.yaneva@mu-plovdiv.bg

⁴ Medical University of Sofia, Bulgaria: Dept. "Physiotherapy", Faculty of Public Health; Medical University of Plovdiv, Bulgaria: Dept. "Health Care Management", Faculty of Public Health, vanina_delfi@abv.bg

DEEP VEINS THROMBOSIS MIMICKING AN INFECTION IN A POSTPARTUM WOMAN

Entela Kolovani¹, Ergys Ramosaço², Edlira Bylykbashi³, Dhimiter Kraja⁴

Abstract: Ovarian Vein Thrombosis (OVT) is a rare, yet a serious complication, especially if it extends to an inferior cava vein. OVT can occur at any stage, but it mostly occurs during the postpartum period. Diagnosis is not often immediately apparent, and many other diseases can mimic this condition. Exclusion of any infectious etiologic cause in a postpartum patient with fever is the first step in establishing an OVT diagnosis. It can be accurately diagnosed by appropriate non-invasive investigations to enable early therapy with anticoagulants and intravenous antibiotics, which are the mainstay of treatment. We present a case of a 38-year-old female in the postpartum period who was diagnosed with right OVT reaching the inferior vein cava after a vaginal delivery. She was treated with intravenous antibiotic and anticoagulant therapy and had a successful recovery after repeated image six months after, showing complete resolution of thrombus.

UDC Classification: 618, **DOI:** <https://doi.org/10.12955/pmp.v1.99>

Keywords: Ovarian vein thrombosis, inferior cava inferior, postpartum,

¹ Infectious Diseases Clinic, University Hospital Centre “Mother Teresa” Tirana, Albania.
vlasiovi@hotmail.com

² Infectious Diseases Clinic, University Hospital Centre “Mother Teresa” Tirana, Albania, erdara1er@yahoo.it

³ University Hospital Obstetrics and Gynecology “Queen Geraldine”, Tirana, Albania,
eda.bylykbashi@gmail.com

⁴ Infectious Diseases Clinic, University Hospital Centre “Mother Teresa” Tirana, Albania,
lulikraja@hotmail.com

ETHICAL ASPECTS OF THE USE OF INNOVATIVE INFORMATION TECHNOLOGIES IN CLINICAL TRIALS

Nikoleta Leventi¹, Alexandrina Vodenitcharova², Kristina Popova³

Abstract:

A clinical trial, according to the WHO, “is any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes. Interventions include but are not restricted to drugs, cells and other biological products, surgical procedures, radiological procedures, devices, behavioural treatments, process-of-care changes, preventive care, etc”.

The application of innovative information technologies like artificial intelligence and big data analytics in clinical trial processes is a new challenge. Such systems are useful tools, and promise to enhance the healthcare management, and to optimize clinical outcomes and economic effectiveness. However, their use raises ethical and social issues.

In this direction, the European Commission in June 2018 set up the High Level Expert Group on AI, which offers guidance on a comprehensive framework for trustworthy AI. Trustworthy AI consists of three components, which should be met during the entire life cycle of the system: (1) it should be lawful, (2) it should be ethical, and (3) it should be robust.

In this article we used the focus group methodology to obtain information from experts about the ethical aspects raised when innovative information technologies like artificial intelligence and big data analytics are used in clinical trials. Feedback from the experts was also gathered regarding the usage of the proposed guidelines for trustworthy AI, as an evaluation tool for the particular case of clinical trials.

UDC Classification: 614.2, **DOI:** <https://doi.org/10.12955/pmp.v1.100>

Keywords: medical ethics, clinical trials, trustworthy AI.

¹ Faculty of Public Health, Department of HTA, Medical University of Sofia, n.leventi@fz.mu-sofia.bg

² Faculty of Public Health, Department of Health Policy and Management, Medical University of Sofia, al.vodenicharova@abv.bg

³ Faculty of Public Health, Department of Social Medicine, Medical University of Sofia, popova_kristina@yahoo.com

POOL WATER OVERCHLORINATION IN TIMIS COUNTY, ROMANIA: CASE-STUDY

Cristina Petrescu¹, Calin Muntean²

Abstract:

Objective: The aim of the study conducted was to investigate residual chlorine concentrations in pool water from Timis County, Romania over two years (2016-2017). Material of study consisted of a sample of 50 pools from Timis County from which were collected and analyzed 154 water tests.

The Method was an observational inquiry (case-study) of the residual chlorine concentrations considering spatial and temporal distribution and comparing with actual standards (4 groups of residual chlorine concentrations were considered).

Results: Average concentrations of residual chlorine exceeded 0,5mg/l in 30 investigated pools. Monthly mean concentrations of residual chlorine exceeded 0.5mg/l 20 of the 24 months of the investigation period. The maximum value of residual chlorine monthly mean concentration was recorded in July, 2017 and the highest average concentration at the pool I3. An Anova Oneway analysis indicated a statistically significant difference ($F=30.312$, Sig.0.000) between the 4 groups of residual chlorine concentrations: over 1.5 mg/l / (0-0.5mg/l, Sig.000; 0.5-1mg/l, Sig.0.001, 1-1.5mg/l, Sig.0.009).

Conclusion: There is an over-chlorination of pool water of Timis County, Romania, with spatial and temporal variation and statistically significant differences between groups of residual chlorine concentrations.

UDC Classification: 614.7, **DOI:** <https://doi.org/10.12955/pmp.v1.101>

Keywords: residual chlorine, pool water, Timis County, case-study.

¹ Department of Hygiene, "Victor Babes" University of Medicine and Pharmacy Timisoara, Romania, cpetrescu64a@yahoo.com

² Department of Medical Informatics, "Victor Babes" University of Medicine and Pharmacy Timisoara and Department of Inspection and Control of Risk factors in the living and working environment, Public Health Direction Timis, Romania, calin.muntean@gmail.com

NANOCHROMIUM CITRATE: ANTIHYPERGLYCEMIC AND PANCREATOPROTECTIVE ACTION AGAINST UNDERLYING DEXAMETHASONE-INDUCED DIABETES MELLITUS

**Kateryna Sadohurska¹, Rayisa Kosuba², Nataliia Muzyka³, Iuliia Greshko⁴,
Roksolana Basaraba⁵**

Abstract:

Introduction: The Ukrainian State Scientific-Research Institute of Nanobiotechnology and Resources Saving has received nanochromium citrate (NCC), a new chrome compound, by means of the electric pulse aquanotechnology method.

Objectives: to determine nanochromium citrate efficacy with experimental dexamethasone-induced diabetes through the results of antihyperglycemic activity and its effect on the pancreatic histological structure.

Methods: diabetes mellitus was simulated by dexamethasone administration on 18-month male rats. The morphological structure of the pancreas was examined in comparison with metformin. Examination of the pancreas morphological structure considered the amount, distribution and size of the pancreatic islets and their cellular shape.

Results: on the 14th day of simulated diabetes mellitus the preventive -therapeutic indication of nanochromium citrate promoted a decrease of glycemia level twice. The administration of nanochromium citrate with underlying diabetes mellitus is not inferior to metformin and its protective effect on the pancreas morphological structure exceeds the effect of metformin.

Conclusion: nanochromium citrate of experimental dexamethasone-induced diabetes mellitus in rats decreases the glycemia level twice which does not differ reliably from the effect of metformin antihyperglycemic. The cytoprotective effect of nanochromium citrate produced on the histological structure of the pancreas is found to exceed metformin action.

UDC Classification: 615.252.349.7:616.379, **DOI:** <https://doi.org/10.12955/pmp.v1.102>

Keywords: nanochromium citrate, hypoglycemic activity, experimental diabetes mellitus, metformin

¹ Higher State Educational Establishment of Ukraine „Bukovinian State Medical University“, Chernivtsi, Ukraine, sadogurska.katya@ukr.net

² Higher State Educational Establishment of Ukraine „Bukovinian State Medical University“, Chernivtsi, Ukraine, gordienko.viktor@bsmu.edu.ua

³ Higher State Educational Establishment of Ukraine „Bukovinian State Medical University“, Chernivtsi, Ukraine, muzykanataliya@ukr.net

⁴ Higher State Educational Establishment of Ukraine „Bukovinian State Medical University“, Chernivtsi, Ukraine, greshkojulia@ukr.net

⁵ Higher State Educational Establishment of Ukraine „Bukovinian State Medical University“, Chernivtsi, Ukraine, roksishka@i.ua

DIAGNOSTIC POSSIBILITIES OF ANALYSIS OF THE MAP OF LINEAR BIREFRINGENCE OF THE CRYSTAL FRACTION OF VITREOUS BODY FOR ACCURATE DETERMINATION OF THE TIME SINCE DEATH

Yuliia Sarkisova¹, Viktor Bachynskiy², Alina Palamar³, Nadya Palibroda⁴,
Maryna Patratii⁵

Abstract:

Introduction: This paper discusses the possibility of polarization microscopic tomography of polycrystalline structure of vitreous body (VB) for use in forensics and in determining the time since death (TSD).

Objectives: The purpose of this study was to develop a new set of forensic criteria to enhance the functionality of the high-precision definition of TSD over a long period of time according to polarization microscopic tomography of the polycrystalline structure of the VB of the human eye by statistical and wavelet analysis.

Results: We obtained the numerical values of the change in the magnitude of the statistical moments of the 1-4 orders, which characterize the coordinate distributions of the magnitude of the linear birefringence (LB) of the polycrystalline component of the VB by the magnitude of the TSD. The results from our research illustrate the differences between the optical anisotropy of fibrillar collagen networks of VB layers with different TSD. The sensitivity range (36 hours) and accuracy (15 minutes) of the method of polarization tomography of the LB distributions of the polycrystalline component of the VB layers in the determined TSD were established.

Conclusion: These results confirm the experimental processes outlined accurately determine the time of death. In turn, will provide scientific evidence, specifications thereof, and objective expert opinion.

UDC Classification: 616-091, **DOI:** <https://doi.org/10.12955/pmp.v1.103>

Keywords: Post-mortem interval, vitreous body, polarization.

¹ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Forensic Medicine and Medical Law Department, Chernivtsi, Ukraine, liquiritia.s@gmail.com

² Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Forensic Medicine and Medical Law Department, Chernivtsi, Ukraine

³ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Internal Medicine and Infectious Diseases Department, Chernivtsi, Ukraine

⁴ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Internal Medicine and Infectious Diseases Department, Chernivtsi, Ukraine

⁵ Higher State Educational Establishment of Ukraine “Bukovinian State Medical University”, Internal Medicine and Infectious Diseases Department, Chernivtsi, Ukraine

THE IMPORTANCE OF THE INITIAL POSTPARTUM/ POSTNATAL HOUR AND SKIN-TO-SKIN CONTACT – A TIME FOR CHANGE IN BULGARIA.

Ivanichka Serbezova¹, Daniela Lyutakova²

Abstract:

INTRODUCTION: This paper explores the practices surrounding skin-to-skin contact of mother and child immediately after birth within Bulgarian maternity wards and describes women's experiences. It takes into consideration the research of Bulgarian experts in breastfeeding and contemporary recommendations for postnatal care worldwide.

Obstetric practices in local maternity wards are reviewed and evidenced by the research findings. The results put into perspective the different experiences that Bulgarian mothers have in local wards, and the authors explore these women's attitudes towards the routine implementation of skin-to-skin contact in postnatal care.

The paper also outlines setbacks for introducing the practice in Bulgarian maternity wards due to the lack of midwife-led care and the importance of specialized care in optimizing health and a better understanding of skin-to-skin care.

OBJECTIVES: Purposes of this research are: (1) to explore women's knowledge about skin-to-skin benefits, including their past experiences with the practice, and (2) to assess their own personal motivation and willingness to engage in the practice themselves.

METHODS: The methodology applied includes an online-based anonymous survey that aims to explore parents' current levels of knowledge and gather their viewpoints regarding the practice. The research has been conducted on social media channels between the 26th of January 2020 and the 26th of February 2020 and includes women from varying local parent support groups: both respondents from a focus group, the area of Ruse, Bulgaria, and respondents from other major Bulgarian cities. The research findings are illustrated herein, and the authors discuss attitudes, as evidenced by the respondents' opinions, expressed through the survey.

RESULTS: A total of 771 cases are included, which come from both groups. The research demonstrates common practices in local hospital wards are inconsistent with WHO recommendations and evidence-based medicine. Skin-to-skin care is practically a non-existent practice within immediate postnatal care, with most mothers separated from their baby during this crucial first hour(s). Almost all the women surveyed are willing to engage in, and embrace, skin-to-skin practices to be introduced as part of the routine within local maternity wards.

CONCLUSION: Midwives' numbers in hospitals are dwindling, and women identify this as a worrying trend for the success of skin-to-skin bonding for new mothers. Evidence-based medical research and parental opinion compel us to rethink current postnatal practices, and therefore it is logical to suggest sustainable and realistic strategies for promoting and implementation of effective guidelines.

UDC Classification: 618, **DOI:** <https://doi.org/10.12955/pmp.v1.104>

Keywords: skin-to-skin, birth, midwife, newborn, postpartum, postnatal, healthcare

¹ Ruse University „Angel Kanchev“, Faculty of Public Health and Health Care, iserbezova@uni-ruse.bg

² Ruse University „Angel Kanchev“, Faculty of Public Health and Health Care, lachezarova@gmail.com

IMPACT OF ANXIETY AND TERROR OF DEATH ON QUALITY OF LIFE IN PATIENTS ON CHRONIC HEMODIALYSIS

Olha Shevchuk-Kravchenko¹, Oksana Penderetska², Ivan Garazdiuk³,
Oleksandr Garazdiuk⁴, Viktor Bachynskiy⁵

Abstract: The aim of the study was to identify the terror of death and anxiety level in patients with end-stage renal disease receiving renal replacement therapy using chronic hemodialysis (HD) and to evaluate the impact of patients' psychological status on medical staff, selection of basic methods of psychotherapeutic care for patients in this category. We involved 37 patients, aged 33-72 years (mean, 45.6 ± 3.8 years). The duration of chronic HD ranged from 8 months to 10 years, with an average of 4.6 years. All the patients had a stable nutritional status, HD regimen and drug therapy for at least 3 months. To diagnose the psychological state of patients we used: the scale of self-assessment of the level of situational and personal anxiety (Spielberger-Hanin's Scale), personal questionnaire for changes at the onset of HD therapy, elements of a clinical interview, image apperception test (simplified version of Thematic apperception test., Bechtere's Institute Personal Questionnaire for Diagnosis of Type of Illness (LOBI), Locus of control and personal changes after initiation of HD therapy.

We found that the: adaptation of the patient to HD therapy is complicated due to the high degree of anxiety and maladaptive terror of death, which reduce the patient's quality of life. The HD procedure increases the level of situational anxiety and requires psycho-correction. HD therapy requires activation of the patient's psychological protection mechanisms, since the dominant protective mechanisms of the psyche in this type of substitution treatment are displacement and negation. The inflexible and rigid use of the latter provokes maladaptive reactions when interacting with healthcare providers, a non-constructive approach to lifestyle choices, work-rest regime, and diet. Patients with a maladaptive mode of adjustment to HD therapy require psychotherapy assistance. There is a need to monitor the psychological status of not only patients, but also medical staff, which due to the specificity of the contingent increases the level of contingent own terror of death. Doctors of HD units require participation in mutual support groups.

UDC Classification: 616-052, 616-051, **DOI:** <https://doi.org/10.12955/pmp.v1.105>

Keywords: anxiety, hemodialysis, terror of death, quality of life, burnout

¹ Bukovinian State Medical University, Chernivtsi, Ukraine, pk@bsmu.edu.ua

² Bukovinian State Medical University, Chernivtsi, Ukraine, pk@bsmu.edu.ua

³ Bukovinian State Medical University, Chernivtsi, Ukraine, i.harazdiuk@bsmu.edu.ua

⁴ Bukovinian State Medical University, Chernivtsi, Ukraine, garazdyuk.olexandr@bsmu.edu.ua

⁵ Bukovinian State Medical University, Chernivtsi, Ukraine, sudmed@bsmu.edu.ua

ACNE PREVALENCE, AWARENESS AND PERCEPTION AMONG YOUNG POPULATION

Gražina Šniepienė¹, Rita Jankauskienė²

Abstract:

Background. Acne is a very common dermatological condition, very few studies have been done regarding the knowledge, beliefs, and perceptions about the various treatment modalities and causative factors (nutrition, medication, cosmetics, pollutants, psychological and lifestyle factors and etc.) of acne.

Methods. A quantitative written survey was performed. Survey sample – 451 young people 18-34 years old. Data analysis was performed using SPSS 26.0, calculated percentage frequencies, mean and standard deviation (SD), Pearson's Chi Square test was used to detect statistically significant differences and correlation analysis was performed using the Spearman correlation.

Results. The study shows that acne affects 49.9% of the surveyed young people. The prevalence of acne depends on the type of skin, tendency to have skin imperfections and genetic factors. Awareness and perception of skin care, factors affecting the occurrence of acne, and treatments used do not depend on the age of respondents.

Conclusions. Young people lack professional knowledge of acne, skin care, and acne-provoking factors. They should take care of themselves, choose the right information from reliable sources and seek the help of specialists. Identifying the negative exogenous and endogenous factors and thus reducing their impact are mandatory for an adequate acne management.

UDC Classification: 616.5, **DOI:** <https://doi.org/10.12955/pmp.v1.106>

Keywords: acne, prevalence, perception, exogenous factors, prevention.

¹ Klaipeda State University of Applied Sciences, Faculty of Health Science, Physiotherapy and Beauty Therapy Department; Klaipeda University, Faculty of Health Sciences, Department of Nursing; Lithuania, g.sniepiene@kvk.lt

² Klaipeda State University of Applied Sciences, Faculty of Health Science, Physiotherapy and Beauty Therapy Department; Klaipeda University, Faculty of Health Sciences, Department of Medical Technologies; Lithuania, r.jankauskiene@kvk.lt

EVALUATION OF EFFECTS OF CORRECTIVE EXERCISES ON PES PLANOVALGUS IN PRESCHOOL CHILDREN

Miroslava Šutvajová¹, Kristína Buľáková², Peter Bartík³, Anna Lesňáková⁴,
Zuzana Hudáková⁵

Abstract:

Introduction: The foot forms the natural base of the human body bearing all its weight. Over the course of a person's life, the foot ensures the contact of the body with the terrain and creates the basic support during dynamic activities such as walking or running, especially on uneven terrain. (Véle, 2006)

Objectives: The aim of the research was to verify the effects of targeted corrective exercises on healthy foot development in preschool children.

Methods: The research was conducted from September 2018 to March 2019. The research sample consisted of 105 probands (59 preschool girls and 46 preschool boys), out of whom 7.62% had the physiological position of the arch on the right foot during baseline measurements. The average age of probands was 5 years. The measured parameters were the foot arch height without and with a load. Measurements were taken before and after rehabilitation intervention.

Results: The statistical analysis of the results confirmed the positive effect of rehabilitation treatment in all monitored variables on statistically significant difference in terms of an elevation in the foot arch ($p < 0.005$) and the influence of risk factors contributing to the development of researched foot deformities. The obtained data were processed into tables and graphs and subsequently evaluated.

Conclusion: Our study has shown that the most effective is the active exercise strengthening. The affected muscles maintain the foot arch as well as the whole posture.

UDC Classification: 615.8, **DOI:** <https://doi.org/10.12955/pmp.v1.107>

Keywords: Flat Foot, Children, Sensorimotor Stimulation.

¹ Faculty of Health, Catholic University in Ružomberok, Slovakia, ferancova.mirka@gmail.com

² Faculty of Health, Catholic University in Ružomberok, Slovakia, kristina.bulakova@gmail.com

³ Faculty of Health, Catholic University in Ružomberok, Slovakia, pbartik@psu.edu.sa

⁴ Central Military Hospital SNU-FH Ružomberok and Faculty of Health, Catholic University in Ružomberok, Slovakia, anna.lesnakova@ku.sk

⁵ Faculty of Health, Catholic University in Ružomberok, Slovakia, zuzana.hudakova@ku.sk

Correspondence should be addressed to Kristína Buľáková, kristina.bulakova@gmail.com

SIGNIFICANCE OF CLINICAL AND LABORATORY MARKERS IN DISORDERS OF THE FUNCTIONAL CONDITION OF THE HEPATOBILIARY SYSTEM IN NEONATAL JAUNDICE

Yuliia Volosivska¹, Yuliia Hodovanets², Lilia Yurieva³

Abstract:

INTRODUCTION: The liver is the central organ of metabolic activity in the body.

OBJECTIVES: The purpose of this study was to determine predictors, major clinical features, and laboratory criteria for the severity of disorders of the functional state of the hepatobiliary system in newborns with neonatal jaundice (NJ). The study included 164 full-term infants. The main group - 92 children, with manifestations of pathological jaundice, was divided into two subgroups, depending on the severity of the pathology, considering concomitant perinatal pathology. IA group (46 children) includes children, condition of which was defined as moderate, IB (46 children) – children, condition of which was defined as severe, the control group consisted of 72 healthy term infants.

METHODS: The complex of examination methods includes: collection of anamnesis of antenatal and perinatal periods in the mother, clinical examination of the newborn and laboratory methods of examination: blood biochemical analysis (TSB blood, bilirubin fractions, activity of ALT enzymes, AST, ALP, γ -GT, glucose level of blood serum, cholesterol, triglycerides) ultrasound examination of infants' liver.

RESULTS: Clinical symptoms that confirmed the functional impairment of the hepatobiliary system (HBS) in newborns who had signs of NJ in perinatal pathology are: hepatosplenomegaly, impaired bowel function, hypoglycemia, anemic syndrome, hemorrhagic disorders. The results of biochemical studies of the blood showed an increase in the severity of the pathology, an increase in the level of TSB and the fraction of indirect bilirubin, activation of the cytolysis markers of ALT and AST, increase of LDH activity, decrease in the activity of γ -GT and ALP, as well as decrease in the level of total protein, albumin, glucose, increase in the level of urea, cholesterol and triglycerides. The most explicit manifestations of HBS dysfunction were found in newborns with a severe condition at birth and in the early neonatal period caused both by the NJ and other comorbidities. Taking into account the revealed deepening of biochemical changes in indicators of blood serum in correlation with the increase of clinical manifestations of pathology, the diagnosis of changes in the early stages will allow to diagnose in time the disorders of the functional state of HBS in NJ for the purpose of appropriate therapeutic correction.

CONCLUSION: The results of the analysis of anamnestic and clinical-laboratory parameters in newborns with NJ showed on the background of a clinical signs of dysfunction of the hepatobiliary system, the presence of significant biochemical changes, especially enzymatic activity, including, ALT, AST, LDH, ALP, and γ -GT and, also an increase in TBS levels and an indirect bilirubin fraction, a decrease in total protein and albumin, glucose, a rise in urea, cholesterol and triglycerides.

The use of a biochemical markers in newborns with clinical manifestations of neonatal jaundice, especially in cases of significant severity of the condition with concomitant perinatal pathology, requires more detailed analysis in order to determine the main pathogenesis of disorders of the functional state of the hepatobiliary system for the purpose of timely correction and improvement of the outcome of treatment.

UDC Classification: 616.36-008.5/.6-053.1-071-074, **DOI:** <https://doi.org/10.12955/pmp.v1.108>

Keywords: newborn, jaundice, liver, hepatobiliary system, biochemical markers

¹ Higher state educational establishment of Ukraine “Bukovinian state medical university”, Department of Pediatrics, Neonatology and Perinatal Medicine, Chernivtsi, Ukraine, volosivska@ukr.net

² Higher state educational establishment of Ukraine “Bukovinian state medical university”, Department of Pediatrics, Neonatology and Perinatal Medicine, Chernivtsi, Ukraine, yul.godovanets@gmail.com

³ Higher state educational establishment of Ukraine “Bukovinian state medical university”, Department of Obstetrics, Gynecology and Perinatology, Chernivtsi, Ukraine, yurieva.lilia@bsmu.edu.ua

EFFECT OF N-METHYL-2-PYROLIDONE AND SOME TERPENES ON *IN VITRO* PERCUTANEOUS PERMEATION OF MELOXICAM FROM HYDROETHANOLIC GELS

Lavinia Vlaia¹, Georgeta Coneac², Ioana Olariu³, Ana Maria Muț⁴, Vicențiu Vlaia⁵, Dan Dragoș⁶, Dumitru Lupuleasa⁷

Abstract:

Introduction. In order to avoid the adverse effects of orally administered meloxicam, its topical application is an attractive alternative. However, a major obstacle to dermal administration of meloxicam is its limited permeation through the stratum corneum, inconvenient that can be overcome by the use of various penetration enhancers.

Purpose of study. The purpose of experimental study was to investigate the possibility of using 5% w/w N-methyl-2-pyrrolidone (NMP) and some terpenes (menthol, camphor, thymol and eucalyptol), alone or associated, as percutaneous penetration enhancers of meloxicam from hydroethanolic gels.

Methods. Two series of 1% w/w meloxicam hydrogels based on 0.8-1% w/w carbomer and containing 40% ethanol and 20% w/w propyleneglycol as cosolvents, and 5% w/w terpene alone or associated with NMP were prepared and evaluated *versus* two „control“ gels for *in vitro* drug permeation through pig ear skin, using vertical diffusion cells. Enhancement ratio (ER_{flux}), indicating the penetration enhancer efficacy, was determined based on meloxicam flux values through biological membrane.

Results. Among the studied terpenes, the most effective as penetration enhancer was thymol, followed by menthol and eucalyptol (ER_{flux} 16.96, 9.40 and 4.78 respectively). Further, associating in formulation NMP with a terpene, synergistic effect was observed in all cases, but especially for hydrogels containing menthol, eucalyptol or thymol (ER_{flux} 12.35, 5.78 and 3.20 respectively).

Conclusion. The results suggest that menthol, thymol and eucalyptol alone or associated with NMP could be the penetration enhancers of choice for meloxicam from topical carbomer-based hydroethanolic gels.

UDC Classification: 615

Keywords: meloxicam, terpenes, N-methyl-2-pyrrolidone, penetration enhancer, *in vitro*, topical, hydroethanolic gel.

¹ Faculty of Pharmacy, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Romania, laviniav@umft.ro

² Faculty of Pharmacy, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Romania, coneac.georgeta@umft.ro

³ Faculty of Pharmacy, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Romania, olariu.ioana@umft.ro

⁴ Faculty of Pharmacy, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Romania, mut.anamaria@umft.ro

⁵ Faculty of Pharmacy, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Romania, vlaiav@umft.ro

⁶ Faculty of Pharmacy, “Victor Babeș” University of Medicine and Pharmacy, Timișoara, Romania, dan.dragos@umft.ro

⁷ Faculty of Pharmacy, “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania, tata_fiul@yahoo.com

Section 4: Natural Sciences and ICT

DASHCAM AS A DEVICE TO INCREASE THE ROAD SAFETY LEVEL

Veronika Adamová¹

Abstract: In recent years, there has been a huge boom in the market in terms of both supply and demand for dashcams. This stems from the purpose of the camera installed in the vehicle. Dashcams are currently becoming an important aid in solving various adverse incidents, such as detecting violations of traffic regulations and other laws and recording and clarifying the course of a traffic accident or other criminologically relevant event. The purpose of this camera is to monitor the space in front and behind the vehicle, or the situation inside the vehicle. The content of this article is aimed at acquainting the reader with basic information about dashcams. Specifically, the individual parts of the article will discuss the importance and significance of the dashcams, the benefits of its use, and the legislative framework that regulates its use. The paper will conclude with a brief overview of innovative approaches based on the application of a dashcam for the purpose of increasing the level of safety of road users while driving a vehicle.

UDC Classification: 629.06, **DOI:** <https://doi.org/10.12955/pns.v1.113>

Keywords: criminologically relevant event, dashcam, digital evidence, safety, traffic accident

¹ University of Žilina, Faculty of Security Engineering, Department of Security Management, Slovakia, veronika.adamova@fbi.uniza.sk

THE EFFICIENCY OF IRRIGATION AND VARIETY ON THE HARVEST RATIO OF THREE COTTON TYPES (*Gossypium hirsutum* L.)

Galina Gospodinova¹, Antoniya Stoyanova², Velika Kuneva³

Abstract: The purpose of this research is to investigate the impact of variety and irrigation on three cotton types, and to study the effectiveness of irrigation on the productivity of these cotton types which were fed by different norms of mineral nutrition. To assess the impact of soil humidity and fertilizer amount, we set up a field trial with three varieties of cotton. The field experiment was carried out within the Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria between 2018-2019. A two way factorial ANOVA (with variety and irrigation as factors) suggested a significant main effect of irrigation ($p < .001$). Variety showed the strongest impact on the differences in "flowering" of cotton which were 64% in 2018 and 41% for 2019 respectively. We established an efficiency coefficient (KEF) representing the ratio of the additional harvest and the actual irrigation rate. The KEF of irrigation water varied depending on the cotton varieties and the levels of fertilization. The highest values of KEF were recorded after fertilization by N_8 as given by units of cultivar Heliuss ($EF = 0.67$). The effect of irrigation, expressed as a harvest per unit of irrigation water considerably varied over years. It was established as a ratio between the irrigation rate and the additional cotton produce. At zero fertilization Heliuss, each cubic meter of water carried an average 2.24 kilograms of cotton harvest over two years. Optimizing the water supply and fertilizing with N_{16} provided 2.83 kilograms. On average, the Darmi variety irrigation effect ranged from 0.63 kilograms (N_{24}) to 2.43 kilograms per cubic meter (N_{16}) during the given period.

UDC Classification: 631.5, **DOI:** <https://doi.org/10.12955/pns.v1.114>

Keywords: cotton, irrigation, fertilization, productivity, efficiency factor

¹ Faculty of Agriculture, Trakia University, Bulgaria, galina.gospodinova37@googlemail.com

² Faculty of Agriculture, Trakia University, Bulgaria, toni_1219@abv.bg

³ Agricultural University, Plovdiv, Bulgaria, kuneva@au-plovdiv.bg

TESTING OF NATURAL INSULATION MATERIALS USING A CONICAL CALORIMETER

Michael Horváthová¹, Linda Makovická Osvaldová²

Abstract: This paper examines three types of natural insulation materials, such as fiberboard, hemp and straw, from the point of view of fire safety. Cellulose-based materials allow a wide range of applications when used for insulation and weatherproofing of buildings, in particular floors, roofs, ceilings, attics, sound barriers, etc. The use of these materials is increasing in ecological constructions as well as for weatherproofing wood-based structures. In terms of fire safety requirements, the question is: Which insulating material is the safest in terms of fire propagation? The article focuses on natural products used as external insulation systems which are covered by a facade plaster. Each type of insulation is briefly described in terms of its composition, use, and production process. We describe the process of preparation of samples as well as the testing and measurement procedures. Three tests were carried out for each type of material. For a more objective evaluation, results were averaged. The results of the cone calorimeter were used to obtain data for comparison. The aim is to clarify the behavior of the natural insulating material with regard to the heat release rate, ignition time, burning duration, and maximum heat release rate. These are the essential parameters for comparison. The values were compared to determine the safest material from the point of view of fire safety.

UDC Classification: 536.6, **DOI:** <https://doi.org/10.12955/pns.v1.115>

Keywords: natural insulating material, cone calorimeter, heat release rate, straw, hemp, fiber board.

¹ University of Žilina Faculty of Security Engineering Department of Fire Engineering, Slovak Republic, michaela.horvathova@fbi.uniza.sk

² University of Žilina Faculty of Security Engineering Department of Fire Engineering, Slovak Republic, linda.makovicka@fbi.uniza.sk

ANALYSIS OF MATHEMATICAL RELATIONS FOR CALCULATION OF EXPLOSION WAVE OVERPRESSURE

Richard Jankura¹, Zuzana Zvaková², Martin Boros³

Abstract: The explosion of an explosive system causes primary and secondary effects on people and objects near its site. The most devastating is the pressure effect of the explosion, especially the overpressure. Individual parameters of pressure wave (overpressure size, duration impulse) can be determined by mathematical or virtual modeling or can also be measured under real conditions.

The authors focused on the parameters of the positive phase of the shock wave propagating from the source of the explosion towards the object. The article covers the description and analysis of selected mathematical relations, which are used to determine the magnitude of the explosion overpressure. The results are based on selected formulas. The source of the explosion referred in the study is an explosive system containing a reference explosive trinitrotoluene (TNT). TNT is a military explosive that is used as a reference explosive in technical standards dedicated to the certification of explosion-proof elements, and at the same time, a TNT equivalent is known to allow the mass of an explosive charge to be recalculated.

The results obtained by mathematical modeling according to individual approaches have been compared and the possibilities of using computational models in the area of security management and education of security managers have been identified. The results of the study confirm that prediction of pressure wave parameters at different distances and weights can assist security managers in creating attack scenarios and designing a suitable object protection system.

UDC Classification: 531, **DOI:** <https://doi.org/10.12955/pns.v1.116>

Keywords: blast load, overpressure, mathematical models, scaled distance.

¹ University of Žilina, Faculty of Security Engineering, Žilina, Slovakia, richard.jankura@fbi.uniza.sk

² University of Žilina, Faculty of Security Engineering, Žilina, Slovakia, zuzana.zvakova@fbi.uniza.sk

³ University of Žilina, Faculty of Security Engineering, Žilina, Slovakia, martin.boros@fbi.uniza.sk

DEVELOPMENT OF A POSTPROCESSOR FOR TURNING CENTER AND MULTI-TASK MACHINE WITH MULTI-CHANNEL CNC SYSTEMS

Tsvetan Kaldashev¹

Abstract: This article discusses the possibility of developing a postprocessor for turning center with 2 turrets and a multi-channel CNC system with NC program format characteristic of machine Mazak Integrex I series. Typical for these CNCs is the usage of two support programs - one for each turret. The CAD / CAM system PTC Creo is used to solve the problem, where tool transitions are developed for machining the workpieces. The postprocessor is software that translates the CL Data file i.e. turns it into a NC program with preparatory, technological, and supplementary commands to control the machine. G-POST, which is integrated into the PTC Creo CAD / CAM system, is used to develop the post-processor. To solve the problem, a specialized programming language FIL (Factory Interface Language) is used which, with its features and capabilities to work with files in ASCII code, achieves the ultimate goal - NC program in format characteristics suitable for machines Mazak Integrex I series.

UDC Classification: 004.42, **DOI:** <https://doi.org/10.12955/pns.v1.117>

Keywords: multi-channel, CNC, postprocessor, CAD/CAM

¹ Faculty of Industrial Technology, Technical University of Sofia, Bulgaria, kaldashev.cvetan@abv.bg

SOME ASPECTS OF THE MATERIALS' OPTICAL LIMITING FEATURES

Natalia Kamanina¹

Abstract: Due to the effective use of the fullerenes and other nanoparticles in the materials for the general optoelectronic, laser and display technique, as well as for biomedicine, the different mechanisms to attenuate the light intensity are considered with good advantage in order to protect the human eyes and technical devices from high laser irradiation. Reverse saturation absorption, complex formation, scattering, etc. are taken into account. In the current paper the influence of the content of the nanoobjects on the interface relief is shown and considered as an additional possible optical limiting mechanism. Moreover, the diffraction from the nanostructured materials via high frequency Kerr effect is added to extend the numbers of the optical limiting mechanisms. Different experimental instruments and supporting models are presented. VIS lasers, AFM, OCA devices are applied to test and visualize the results. Theoretical and experimental data are in good coincidence.

UDC Classification: 532.783; 535; 539.6, **DOI:** <https://doi.org/10.12955/pns.v1.118>

Keywords: Organic materials, surface relief, sensitization, fullerenes and nanotubes, wetting angle, reflection and refraction

¹ Vavilov State Optical Institute, St.- Petersburg, Russia; St.-Petersburg Electrotechnical University ("LETI"), St.-Petersburg, Russia, nvkamanina@mail.ru

FRESHWATER SAPROPEL: BIOLOGICALLY ACTIVE COMPONENTS AND METHODS OF EXTRACTION

Aneka Klavina¹, Agris Auce², Ilona Pavlovska³, Ivars Vanadzins⁴

Abstract: Previously, sapropel has been commonly used in agriculture, cosmetology and medicine in its raw form and there has been no generally accepted method or standard for realizing sapropel extract. However, for sapropel usage in medicine, balneology and pharmacy, it is essential to develop quality criteria for raw sapropel and its extracts.

This review aims at discussing and summing up different techniques for extracting bioactive compounds from sapropel as well as the possibilities of creating quality criteria. This paper covers existing analytical techniques and methodologies; currently, there are few extraction methods using several extractants for obtaining bioactive components from raw sapropel. Different freshwater sapropel types have been described and characterized. Bioactive components in sapropel have been identified and explained. Humic acids and fulvic acids have been identified as the main substances and their extraction methods have been listed. Solid-liquid, ultrasound assisted and supercritical fluid extraction methods have been pointed out as the most suitable. Additionally, analysis and storage conditions of the extracts have been discussed.

There have been found to be no commonly accepted standard methods for sapropel extraction, or for the analysis and characterization of the sapropel extracts. For pharmacological applications, a common approach for the extraction process of active substances from sapropel and the analysis procedures of the extracts need to be established. This review will help equip other researchers with the latest information on this topic.

UDC Classification: 661.1:615.4, **DOI:** <https://doi.org/10.12955/pns.v1.119>

Keywords: Freshwater sapropel, Extraction methods, fulvic acid, humic acid, pharmacy

¹ Riga Stradiņš university, Institute of Occupation Safety and Environmental Health, aneka.klavina@rsu.lv

² Riga Stradiņš university, Institute of Occupation Safety and Environmental Health, a@aa.lv

³ Riga Stradiņš university, Institute of Occupation Safety and Environmental Health, ilona.pavlovska@rsu.lv

⁴ Riga Stradiņš university, Institute of Occupation Safety and Environmental Health, ivars.vanadzins@rsu.lv

MICROBIAL BIOMASS CARBON AND ENZYMATIC DEGRADATION OF CARBOHYDRATES BY APPLICATION OF VERMICULITE TO RECLAIMED SUBSTRATES

Boyka Z. Malcheva¹

Abstract: A vegetation experiment was carried out with different amounts of vermiculite mixed with humus depot substrates, tailings pond and mine, in different proportions, and with an application of mineral fertilization and liming. Biomass carbon of microbial origin has the highest values after the addition of 10% vermiculite, simultaneous application of fertilization and liming, and alone fertilization, compared to controls, without ameliorants. The activity of the studied enzymes - cellulase, amylase, invertase and catalase increased with increasing concentration of vermiculite, as well as in the combined application of fertilization and liming. The values of microbial biomass carbon and enzymes are highest in the variants with substrates from the mine.

UDC Classification: 502, **DOI:** <https://doi.org/10.12955/pns.v1.120>

Keywords: reclaimed substrates, vermiculite, microbial biomass, enzymes

¹ University of Forestry, Sofia, Bulgaria, boika.malcheva@gmail.com

THE ROLE OF BUSINESS INTELLIGENT SYSTEMS IN MONITORING AND ANALYSIS OF UNIVERSITY DATA

Melina Neykova¹, Boyanka Zhelyazova²

Abstract: Nowadays, it has become clear that the success of different sized organizations depends on the speed at which they adapt to the dynamic changes and challenges of competitive market structures. At the same time, it is considered that information is a key element for identifying the strengths and weaknesses of the business activities of organizations and the trends for their future development and market consolidation.

Modern universities face major challenges related to the processing of large amounts of data, which are continuously generated by different systems and units, but in most cases, the information flow is not analysed effectively enough. Namely the efficient extraction of educational data is an important aspect for the analysis of the state of the university as well as the effective planning of its future development.

Therefore, the main purpose of this study is to consider the capabilities of intelligent business analysis information systems to monitor and control the large volumes of data generated at the University of Forestry, Bulgaria. Implementing such a system will help transform data into valuable information and knowledge that will assist academic leadership in taking timely, informed, reasoned managerial decisions and actions, taking into account the dynamic and competitive educational environment and rapidly changing educational needs in higher education.

UDC Classification: 004.02, **DOI:** <https://doi.org/10.12955/pns.v1.121>

Keywords: business intelligence systems, university data analysis, support management decisions

¹ University of Forestry, Faculty of Business Management, Department of Computer Systems and Informatics, Bulgaria, e-mail: mneykova@ltu.bg;

² University of Forestry, Faculty of Business Management, Department of Computer Systems and Informatics, Bulgaria e-mail: bzhelyazova@ltu.bg

ANALYSIS OF PROSPECTS AND OPPORTUNITIES OF CYBER-PHYSICAL SYSTEMS EDUCATION

Galina Nikolcheva¹

Abstract: The readiness for digital transformation of industry is highly dependent from the existence of enough ICT experts with profiles to industrial applications and cyber-physical systems as well as the widespread promotion and application of existing industry standards and practices in the domain of Industry 4.0. The raising of the digital readiness index for the industry requires the development of educational and scientific initiatives in order to create capacity for institutional and organizational acceptance of the requirements and prerequisites of Industry 4.0 as well the creation of pilot projects and demonstration installations for the purpose of visualizing and presenting good practices. This paper analyses prospects and opportunities of Cyber-physical system education in order to prepare well-trained and capable specialists for Industry 4.0. Some good practices in this area are outlined. Ideas for building the foundation of the training as well as the organization of the laboratory practice are presented.

UDC Classification: 621.7, **DOI:** <https://doi.org/10.12955/pns.v1.122>

Keywords: education, cyber-physical systems, Industry 4.0

¹ Technical University of Sofia, Dept. of Mechanical engineering and machine tools, Bulgaria, ginic@tu-sofia.bg

ACCUMULATION AND MOBILE FORMS OF SOME HEAVY METALS IN ROADSIDE URBAN SOILS

**Bogdan Nikolov¹, Slaveya Petrova², Iliana Velcheva³, Nikola Angelov⁴,
Ekaterina Valcheva⁵, Penka Zapryanova⁶, Gergana Hristozova⁷, Evelina Varbanova⁸,
Deyana Georgieva⁹, Violeta Stefanova¹⁰**

Abstract: The accumulation of heavy metals and toxic elements in the topsoil horizon of urban areas is a big environmental problem as they could have long-term implications not only for the soils themselves but also on the human health and well-being. Many studies have shown that there is a clear relationship between the level of urbanization, volume of traffic, intensity of anthropogenic activities and heavy metal load.

We aimed to analyze the accumulation of heavy metals at urban roadside soils and to assess the proportion of their mobile forms. The total content and mobile forms of Cu, Mn, Pb and Zn in soils samples collected along the main boulevards of Plovdiv (Bulgaria) was determined by two instrumental methods - ICP-OES and ICP-MS.

The maximal concentrations were found in the Central and Eastern administrative regions of the city of Plovdiv. This finding well correlated with the wind rose characteristics and urban gradient theory. Our results revealed that the mobile forms of Mn represented 1.38-2.21% of total content and the mobile forms of Zn represented 8.48-11.81% of total content in studied urban soils. Mobile forms of Cu and Pb varied significantly and were in the range of 7.04-14.2% and 7.3-18.67% of the total content, respectively.

UDC Classification: 5(504) , **DOI:** <https://doi.org/10.12955/pns.v1.123>

Keywords: traffic pollution, urban environment, vegetation, soil properties, toxic elements

¹ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Ecology and Environmental Conservation, Plovdiv, Bulgaria, nikolov81bg@yahoo.com

² Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Ecology and Environmental Conservation, Plovdiv, Bulgaria, sl.petrova@abv.bg

³ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Ecology and Environmental Conservation, Plovdiv, Bulgaria, anivelcheva@abv.bg

⁴ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Ecology and Environmental Conservation, Plovdiv, Bulgaria, angelov9444@gmail.com

⁵ Agricultural University, Faculty of Plant Protection and Agroecology, Department of Agroecology and Environmental Protection, katia_valcheva@abv.bg

⁶ Agricultural University, Faculty of Plant Protection and Agroecology, Department of Agroecology and Environmental Protection, p_alexieva@abv.bg

⁷ Agricultural University, Faculty of Plant Protection and Agroecology, Department of Agroecology and Environmental Protection, gerihris2@gmail.com

⁸ Plovdiv University „Paisii Hilendarski“, Faculty of Chemistry, Department of Analytical Chemistry and Computer Chemistry, Plovdiv, Bulgaria, evarbanova@uni-plovdiv.bg

⁹ Plovdiv University „Paisii Hilendarski“, Faculty of Chemistry, Department of Analytical Chemistry and Computer Chemistry, Plovdiv, Bulgaria, georgieva@uni-plovdiv.bg

¹⁰ Plovdiv University „Paisii Hilendarski“, Faculty of Chemistry, Department of Analytical Chemistry and Computer Chemistry, Plovdiv, Bulgaria, stefanova@uni-plovdiv.bg

METHODOLOGICAL MODEL FOR ENHANCEMENT OF THE ECOLOGICAL COMPETENCES OF STUDENTS THROUGH SUSTAINABLE WASTE MANAGEMENT

**Bogdan Nikolov¹, Gergana Stankova², Atidzhe Tabak³, Milena Kateva⁴,
Radina Shamburova⁵, Polina Dzhambazova⁶, Slaveya Petrova⁷, Vanya Naydenova⁸,
Delka Karagyozova-Dilkova⁹**

Abstract: The idea and practice of separate waste collection is widespread in Europe as an effective way of building public awareness of environmental responsibility. The study covers activities on the most current environmental topics: sustainable development, municipal waste, recycling, composting. The project provides opportunities for cooperation and interaction between students in a team organisation of cognitive activity, the implementation of active student learning, and constructivist design of training, which will increase the practical orientation of the acquired knowledge and competences. The project aims at developing an innovative curriculum, curriculum content, methodological model, and didactic materials for the education of high school students and to increase their environmental competence in sustainable waste management at school and in their households. As a result of the training activities following Kolb's cycle, the participants in the study have changed their behaviour with the tendency to reduce the wastes amount and the use of disposable packages.

UDC Classification: 37.04, **DOI:** <https://doi.org/10.12955/pns.v1.125>

Keywords: sustainable development, school, training, ecology

¹ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Ecology and Environmental Conservation, Plovdiv, Bulgaria, nikolov81bg@yahoo.com

² Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Botany and Teaching Methods in Biology, Plovdiv, Bulgaria, g_stankova@abv.bg

³ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Plovdiv, Bulgaria, Bachelor student, tabakatice@abv.bg

⁴ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Plovdiv, Bulgaria, Bachelor student, katevamilena@abv.bg

⁵ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Plovdiv, Bulgaria, Bachelor student, radina973@gmail.com

⁶ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Plovdiv, Bulgaria, Bachelor student, poli_djambazova@abv.bg

⁷ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Ecology and Environmental Conservation, Plovdiv, Bulgaria, sl.petrova@abv.bg

⁸ Plovdiv University - „Lyuben Karavelov“ Branch, Department of Pedagogy, Kardzhali, Bulgaria, vanianay@abv.bg

⁹ Plovdiv University „Paisii Hilendarski“, Faculty of Biology, Department of Botany and Teaching Methods in Biology, Plovdiv, Bulgaria, dkarag@abv.bg

ENERGY EFFICIENCY OF NITROGEN FERTILIZATION IN DURUM WHEAT AND SORGHUM GRAINS

Galia Panayotova¹, Svetla Kostadinova², Ivan Velinov³

Abstract: The objective of this study was to assess the energy efficiency of nitrogen fertilization in durum wheat and sorghum grains in the period 2017-2019. Bulgarian durum wheat variety Predel was studied at a stationary fertilizer trial on soil type *Pellic vertisols* at the Institute of Field Crops in Chirpan, Bulgaria. Grain sorghum hybrid EC Alize was investigated on the experimental field of the Agricultural University of Plovdiv, Bulgaria, on soil type *Mollic Fluvisols*. The crops were grown under non-irrigated conditions. The studied nitrogen rates were 0, 60, 120, 180, and 240 kg N.ha⁻¹. In durum wheat, nitrogen was applied two times: one third at sowing, and the rest - as top dressing in the tillering stage. In sorghum, the total nitrogen was applied as pre-sowing fertilization before sowing. The nitrogen fertilizer was applied as NH₄NO₃. The experimental design was a randomized, complete block design with four replications with a size of experimental plots of 20 m² for both crops. The energy efficiency of nitrogen fertilization (η) was calculated as the ratio between the received energy from additional grain yield of wheat and sorghum, respectively, and the invested energy from fertilization. It was established that energy efficiency of nitrogen fertilization depended on the nitrogen rate and hydro-thermal conditions during the vegetation period of durum wheat and sorghum. The bioenergy coefficient of durum wheat widely varied from 0.79 (N₂₄₀ in 2018) to 4.44 (N₆₀ in 2017). The average for the period, the highest value of energy efficiency of nitrogen fertilization was obtained at the low rate N₆₀. The higher nitrogen rate of 240 kg N.ha⁻¹ was slightly effective. Under drought conditions during the vegetation period of sorghum, most effective was the application of rates N₁₂₀ with the highest energy coefficient of 1.23. The application of 180 kg N.ha⁻¹ to sorghum was the most energy efficient under the favorable hydro-thermal conditions in 2018 and 2019, and the average for the period 2017-2019. A low N₆₀ rate in grain sorghum was inefficient from an energy point of view. Durum wheat showed higher energy efficiency of nitrogen fertilization compared to grain sorghum.

UDC Classification: 633.1, **DOI:** <https://doi.org/10.12955/pns.v1.126>

Keywords: energy efficiency, nitrogen, wheat, sorghum.

¹ Trakia University, Faculty of Agriculture, Department of Plant Production, Stara Zagora, Bulgaria, galia_panayotova@abv.bg

² Agricultural University, Faculty of Agronomy, Department of Agrochemistry and Soil Science, Plovdiv, Bulgaria, svetlak@au-plovdiv.bg

³ Agricultural University, Faculty of Agronomy, Department of Agrochemistry and Soil Science, Plovdiv, Bulgaria, van211@abv.bg

ENGINEERING AND CONSTRUCTION PROJECT MANAGEMENT IN THE DIGITAL TWIN ERA

Ioannis Patias¹

Abstract: The aim of this paper is first to describe the current achievements regarding digitalization technologies in the engineering and construction sector. The concrete technologies presented are the GIS standards as CityGLM and BIM technologies, and as the EUBIMTG initiative. These two technologies can be applied in a common framework building digital twin environments and platforms. These platforms create a huge capacity of gains for the constructions sector in all phases, and for all the actors, as constructions digitalization has a huge unexplored potential. Most of the participants in the value chain will gain from interventions in the engineering and construction (E&C) phases of design, and engineering, construction and operations. Project management (PM) was described as intervention, which creates potential for new business models to be implemented. Virtual modelling can further develop in the direction of virtualization and construction simulation, and contribute towards the successful digitalization of the E&C sector.

UDC Classification Number: 910.1, **DOI:** <https://doi.org/10.12955/pns.v1.127>

Keywords: GIS, BIM, digital twin, E&C, project management.

¹ University of Sofia "St. Kliment Ohridski", Faculty of Mathematics and Informatics, Department Computer Informatics, Bulgaria, patias@fmi.uni-sofia.bg