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**CBU International Conference on Innovations in Science and Education 2021**  
**Book of Abstracts**

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**Petr Hájek, Ondřej Vít**

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## INTRODUCTION

We had the great honor of organizing the CBU International Conference on Innovations in Science and Education 2021 in Prague, Czech Republic. The event was affected by the coronavirus pandemic as every other aspect of life since 2020 worldwide. Since 2013 the conference became an important international event in a cross-industry discussion about innovations in Education and Science.

CBUIC 2021 was organized by the CBU Research Institute, Unicorn University, and ISE Research Institute, all three located in Prague, Czech Republic. The CBU Research Institute published the proceedings.

Three cooperating organizations supported this conference. The participation was lower due to the coronavirus pandemic.

As every year, the purpose of CBUIC 2021 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 2021, 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 2021, 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 2021 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, Unicorn University*  
*David Hartman, Unicorn University*  
Conference chairs

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## **1 – ECONOMICS AND BUSINESS**

## THE INFLUENCE OF THE COVID-19 PANDEMIC ON ALLOCATION OF ASSETS IN INVESTORS PORTFOLIO

Maroš Bobulský<sup>1</sup>, Mária Bohdalová<sup>2</sup>

**Abstract:** Investing during a pandemic is very challenging. Even in these difficult times, the investor must appropriately allocate assets into his portfolio. In this article, we discuss investing in the stock market. We are interested in creating portfolios of shares that consist of financial assets. The individual methods we use are designed to provide an allocation of funds in between individual shares. In the modern portfolio theory, the Markowitz model (Markowitz, 1952) is being used to solve these problems. The paper's main goal is to propose an efficient, robust approach to solve the Markowitz optimization problem adjusted for periods of a global decline in financial markets. In our research, we focus on robust optimization. Instead of precisely given input parameters, we propose a set of parameters from which we always select the worst possible parameter (so-called worst-case optimization). The robustness of optimization is achieved using so-called filter matrices. These matrices are used to modify historical data directly during optimization. The proposed model modifies the data by using different lengths of historical returns. Our proposed model is then compared with the original Markowitz non-robust model. We compare these two models using the properties of the second derivative of the optimization problem. Our results are visualized for different levels of investor's risk aversion. We present our methods on historical price data of five randomly selected companies traded on the US market. By comparing the proposed robust approach with the non-robust one, we show that different lengths of historical returns capture volatility changes earlier. The investor can thus reduce his risk aversion and increase his expected returns.

**JEL Classification Numbers:** C61, G11, G10, C65

**Keywords:** Markowitz model, Robust optimization, Data filtering, Covid-19 crisis, Risk aversion

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## **SALES EXPERIMENT OF A NEWSPAPER PUBLISHER: "PAY WHAT YOU WANT"**

**Lukas Bernfried Bruns<sup>1</sup>**

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**Abstract:** Digitalization poses great challenges for companies and especially for newspaper publishers. Due to the large number of digital competitors on the advertising market, media companies are forced to proactively win customers. A major German media company has thus dared to experiment and put the question of pricing for booking newspaper advertising in the hands of its customers. With the so-called "pay what you want" (PWYW) payment model, customers can be won and additional budgets spent. This paper explores the question of whether PWYW is a suitable sales model for newspaper companies and which factors have an influence. The results of the interviews with those involved show solutions, opportunities, problems and that additional turnover can be generated.

**JEL Classification Numbers:** M31, M37, D40

**Keywords:** sales, marketing, payment model, negotiations, customer involvement.

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## MANAGING RISK WITH THE USE OF COMPUTER SIMULATION

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Martin Gašo<sup>4</sup>, Branislav Mičieta<sup>5</sup>, Milan Martinkovič<sup>6</sup>

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**Abstract:** Internal and external risk management has become an important issue in today's global business environment, which is fraught with health, natural, political, economic and technical threats. This article deals with the design of a methodology for problem-solving and risk management in connection with computer simulation. The risk management methodology proposed by us consists of individual steps, which are summarized into three stages - risk assessment, risk analysis and risk management. The proposed computer simulation methodology consists of several steps, for example creating a parametric simulation model, designing experiments, analysis of the simulation model results or the evaluation of the simulation results. These steps are described in the article. After completing the previous steps, we describe the points of an action plan and what it must contain to avoid consequences and the impact of risks at the lowest possible level. An example of the use of computer simulation is the risk situation associated with the fluctuation of employees. In the end, the proposed methodology is supported by the results of our research and its further direction.

**JEL Classification Numbers:** C88, D81, O14

**Keywords:** computer simulation, risks, industrial engineering, Tecnomatix Plant Simulation, Experiment Manager

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## **ASSESSMENT OF SELECTED DETERMINANTS OF BURNOUT SYNDROME AND COPING STRATEGIES IN TERMS OF GENDER IN ENTREPRENEURS**

**Barbara Nicole Čigarská<sup>1</sup>, Zuzana Birknerová<sup>2</sup>**

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**Abstract:** Nowadays, the issue of burnout syndrome is relatively extensive and increasingly manifested. Although burnout syndrome can affect anyone, certain differences in its occurrence are noticeable, especially in personality traits, gender, or the character of work. This article aims to assess the signals of burnout syndrome and coping strategies in terms of gender. The main determinants of burnout syndrome are Emotional Exhaustion, Depersonalization, and Personal Accomplishment and are included in the Maslach Burnout Inventory, consisting of twenty-two questions, separately dealing with mentioned individual determinants. The Brief Cope inventory, which outlines fourteen strategies about how to cope with stress, was used to find out which coping strategies entrepreneurs used in difficult situations. The research was carried on a representative sample of entrepreneurs (N = 113) in the Slovak Republic by online questionnaire. The result of the analysis reported the existence of statistically significant differences ( $p < .05$ ) between determinants of burnout syndrome and coping strategies in terms of gender among entrepreneurs in the assessment of selected determinants. Entrepreneurs used mostly problem-focused coping strategies like Active coping and Planning, an emotion-focused coping strategy of Humor, a dysfunctional coping strategy of Venting to mitigate the influence of difficult situations. The research assumed the existence of positive differences between the assessment of determinants of burnout syndrome in terms of gender. The results reported a higher tendency of female entrepreneurs to be more often emotionally exhausted than males. Personal Accomplishment and Depersonalization did not report any statistically significant differences in terms of gender.

**JEL Classification Numbers:** A1, M1, L26

**Keywords:** Burnout syndrome. Coping strategies. Maslach Burnout Inventory, The Brief COPE, Entrepreneurs

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## THE IMPORTANCE OF DIGITIZATION AND INNOVATIONS FOR SMALL AND MEDIUM-SIZED ENTERPRISES

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Monika Bučková<sup>4</sup>, Marta Kasajová<sup>5</sup>, Radovan Svitek<sup>6</sup>**

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**Abstract:** The importance of new disrupting technologies and innovations is crucial for Small and Medium-Sized Enterprises (SMEs). SMEs are critical to large factories because, in many cases, they are their suppliers. Therefore, there is a need for digitization solutions, innovative approaches, and disruptive technologies in these factories. These areas significantly disrupt the usual processes in SMEs. SMEs thus have to deal with significant changes in their business in a relatively short time. The benefits of new approaches for SMEs are described in the second half of the article in the case study. This study deals with the possibility of using a software tool from previous research on the workplace for the production planning and logistics systems team in the selected Slovak factory. The paper itself focuses on the Slovak engineering industry, digitalization and innovations. The selected factory manufactures compressor technology. The factory did not hesitate to use the possibility of cooperation and verification of various functionalities. The cooperation aimed to analyze the current state of production of the selected product and the subsequent design of increasing productivity and economic efficiency concerning improving its internal conditions.

**JEL Classification Numbers:** L23, L52, L16, O14

**Keywords:** rationalization, digitization, industrial engineering, productivity, SMEs

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## AUGMENTED REALITY AS A POWERFUL MARKETING TOOL

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**Abstract:** Today's market is oversaturated with new technologies that are slowly moving through our daily routine. Businesses often have to pursue new strategies to reach new customers and retain existing ones. Popular technologies of today undoubtedly include virtual reality (VR) and augmented reality (AR). The application of augmented reality in the field of trade, marketing, promotion of products and services has its own potential and justification. A questionnaire survey of the current state of AR utilization in companies of Central Slovakia shows that the interest in the use of this technology exists in this area, although in practice it is implemented rather rarely. However, a suitable design solution and the worldwide trend of smartphone use can help to achieve the goal of greater implementation. The design of the methodology for the use of AR in the field of marketing consist of a sequence of several basic steps. Verification of the proposed methodology is carried out on a practical example by creating a real mobile application using augmented reality to promote the selected product. The final mobile application includes several attractive features for the end-user which can be accessed through a smartphone and displayed in augmented reality. Such a mobile application in augmented reality provides the company with a powerful marketing tool, but it also has its limitations.

**JEL Classification Numbers:** D47, L10, M30

**Keywords:** augmentation, marketing, mobile, experience, application

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## SECURITY AND SAFETY OF TOURISTS AS A FACTOR FOR SUSTAINABLE TOURISM, BASED ON THE EXAMPLE OF BULGARIAN BLACK SEA RESORTS

Daniela V. Georgieva<sup>1</sup>, Diyana Bankova<sup>2</sup>

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**Abstract:** Different types of crimes are factors negatively affecting tourism worldwide. However, managers and even tourists themselves are refraining from submitting crime reports and whistleblows. The main goal of the study is to analyze the attitude of the hotels' managers on the Bulgarian Black Sea coast, regarding the submission of whistleblows to the competent authorities. In particular, managers of hotels in Albena, Golden Sands, Dunes, St. Constantine and Helena, and Sunny Beach are studied. The main research hypothesis is that hotel managers should ensure the safety of guests by reducing gaps in the control environment, preventing financial frauds, helping for environmental protection, and supporting the process of reporting crimes and suspicious behavior in the hotels. However, the current management policy relies mainly on the installed security devices and the Security Department staff. This results in applying no specific internal rules, procedures, and training for non-security department employees, regarding crime identification and timely reporting. The adopted research methods are based on the logical, deductive, and comparative methods, as well as on the methods of analysis and synthesis. For the empirical study, the method of in-depth interviews is used. The results of the study support the literature by presenting more in-depth data regarding the used security devices and assets by Bulgarian Black Sea resort hotels. Also, more data on the attitude of hotel managers on the safety and security of tourists and the submission of whistleblows, as a factor for sustainable development of tourism on the Bulgarian Black Sea coast, is presented.

**JEL Classification Numbers:** Z32, K14, M42

**Keywords:** hotels' security devices, crime reports, whistleblow, national safety, audit.

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## **NON-FINANCIAL INFORMATION REPORTING AFTER 2016 FOR THE EXAMPLE OF BULGARIAN GREENHOUSE GAS EMITTERS**

**Tsvetomir L. Manolov<sup>1</sup>**

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**Abstract:** Air pollution is one of the main environmental reasons for many diseases in Bulgaria. Plenty of studies indicate that the country is still far from achieving air quality levels that do not pose a risk to people and the environment.

The current research is directed toward eight companies in Bulgaria, which are responsible for over 70% of greenhouse gas emissions from fixed installations. The study was conducted during the period of 2016 to 2019. The main hypothesis is that due to the public importance of these companies' activities, the quantity and quality of non-financial information disclosed by them will be significant. Additionally, it is examined how the required obligation for some companies to publish together with their annual financial statements and non-financial declaration has reflected on the disclosures made by them. The research is conducted on the basis of annual financial statements published by the companies, non-financial declarations, annual activity reports and information contained on their websites.

**JEL Classification Numbers:** M41, Q56

**Keywords:** non-financial information, disclosure, reporting, environmental matters

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## **STRATEGIC AND OPERATIONAL FOCUS OF HEALTH PREVENTION IN PRIVATE AND PUBLIC SECTOR ORGANISATIONS**

**Juliane Meixner<sup>1</sup>**

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**Abstract:** In this paper, with a view to the high levels of absence due to sickness and presenteeism, it is explored how management and team leadership can be integrated on a more sustained basis in health prevention. Private sector enterprises on one hand, and organisations in the public sector, on the other, pursue and prioritise in this aspect different approaches, which are traceable to their different traditions. Specifically in Germany in the public sector, the principle of due care has had a long tradition that grows out of social responsibility, which contrasts with the perspective of commercial enterprises that emphasises the economic aspect. The study undertakes to determine the particular strengths of each of the sectors and to demonstrate their different approaches. The examination refers in its methodology to qualitative social research. In the systemically structured survey design, Seventy six experts were approached with questions concerning different aspects such as corporate culture, business processes, organisational integration, qualification, risk assessments, and concrete actions in health prevention. Complementary to the expert survey, documents such as corporate guidelines and policies, management tools, results from risk assessments and employee surveys or quality offensives were referred to. This analysis supplied insights on how the declared health prevention policies in an organisation can be effectively implemented at the strategic and operational level in corporate culture and leadership culture with a long-term continuity, and which organisational prerequisites in the corporate hierarchy and corporate decision making and business processes may reinforce and sustain successful implementation of health prevention. Of particular importance in the process is operative management. For the sake of effective team involvement in own and team-specific health prevention, an eight-stage team feedback was devised, which includes elements of self-reflection and perception by others in an iteratively structured process.

**JEL Classification Numbers:** M14, M59, L20

**Keywords:** Health management, occupational health & safety (OHS), corporate culture, leadership culture, health control, risk assessment, work climate

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## **DETERMINANTS OF SME ACCESS TO PUBLIC PROCUREMENT: EMPIRICAL EVIDENCE FROM THE VISEGRAD GROUP COUNTRIES**

**Peter Nemec<sup>1</sup>, Peter Džupka<sup>2</sup>**

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**Abstract:** This article aims to investigate the factors influencing the success of small and medium-sized enterprises (SMEs) in public procurement in the Visegrad Group Countries. According to the European Union, tools such as the division of contracts into smaller lots or the evaluation of tenders based on the most economically advantageous tender (MEAT) increase the chances of SME's winning contracts in public procurement. In particular, the evaluation of tenders based on MEAT rather than the lowest price is a tool favoring SMEs, as it boosts their innovative potential, which creates the preconditions for achieving the best value for taxpayers' money. By analyzing more than 150,000 contract award notices published in the Tenders Electronic Daily in 2019, we found a positive effect on SMEs' chances of winning a contract when using framework agreements or dividing contracts into smaller lots. Moreover, the results of multinomial logit regression suggest that the evaluation of tenders based on MEAT rather than lowest prices increases the chances of SMEs to win the contract by more than 50%. However, the findings that the share of SMEs in the total financial value of contracts is less than 20%, with SMEs winning more than 60% of all contracts, suggest that some obstacles of SMEs' access to public contracts, such as financial, administrative or technical complexity of projects may persist and require further research.

**JEL Classification Numbers:** H57, O38

**Keywords:** public procurement, SMEs, most economically advantageous tender,

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## FUZZY AGGREGATION FOR RANKING IN BUSINESS

Eva Rakovská<sup>1</sup>

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**Abstract:** Today, businesses depend strongly on data and the opinion of customers or the experience of managers or experts. The large databases contain non-heterogeneous data, which is the ground for further decisions. Business uses multicriterial decisions in more areas (e.g., customer care, marketing, product development, risk management, HR, etc.) and often it is based on assessment. One of the assessment methods is the ranking, which can be done by crisp values of data where the sharp borders between evaluated entities do not give the adequate ranking result. On the other hand, the ranking process is based on the qualitative assessment, which has linguistic expression. It is more familiar and understandable for people. The article shows how to treat non-heterogeneous data to prepare them for a ranking process using fuzzy sets theory. The article aims at offering several types of ranking methods based on different inputs and preferences of the user and describes appropriate fuzzy aggregations for solving the ranking problem.

**JEL Classification Numbers:** C65, C18

**Keywords:** assessment, ranking, fuzzy aggregation, knowledge discovery in databases

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## **IT SOLUTIONS, PLC.: INTRODUCING A BIG DATA CASE INTO THE ACCOUNTING CURRICULUM**

**Eleonora Stancheva-Todorova<sup>1</sup>, Mirella Dimitrova<sup>2</sup>**

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**Abstract:** By bridging the accounting and data science domains, this paper introduces an interdisciplinary Big Data case study for accounting students that implements a specific methodology framework. It is supported by clear learning objectives and detailed instructor's implementation guidance that complement a fascinating scenario, representing a real-world situation in the data-led world of business. The participants' assignment is to propose a strategy for improving financial position and performance of a particular company by attracting new customers selected among companies, listed on the London Stock Exchange. The data sources of the proposed case study are publicly available and comprise of historical financial and non-financial data, disclosed in companies' annual reports. By performing their assigned roles under the case study scenario, future graduates will build upon their technological competences as well as raise their awareness on the new roles and job tasks of the future accountant. They will also gain understanding on the new advisory function of the accounting specialists and their responsibilities as management consultants in the data-led business world. From a research perspective, this interdisciplinary work demonstrates how expertise in text mining and financial reporting might be combined for revealing new investment opportunities and enhancing management decisions.

**JEL Classification Numbers:** M41, C55

**Keywords:** big data, accounting, case study, interdisciplinary

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## **DYNAMIC LINKAGES BETWEEN STOCK MARKETS: EVIDENCE FROM USA, GERMANY, CHINA AND RUSSIA**

**Rogneda Vasilyeva<sup>1</sup>, Valentin Voytenkov<sup>2</sup>, Alina Urazbaeva<sup>3</sup>**

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**Abstract:** Currently, financial markets are growing rapidly, which increases the necessity to examine the financial sector. Considering the Russian Federation, the amount of private investors has doubled in Russia since the beginning of 2020 (Finam, 2020). It is important to realize how cash flows between the largest stock market indices. The main hypothesis of the research suggests that the U.S., Germany, and China markets result in significant changes in the Russian stock market. The research objective is to determine the degree of the Russian stock market dependence on the markets of developed and developing countries using methods of econometric analysis. Daily data on S&P500, DAX30, Hang Seng, and Moscow Exchange Index from January 1, 2015, to December 31, 2019, were taken. The research method chosen is a cointegration approach, including the construction of vector autoregression and vector error-correction models and the application of Impulse Response Functions. The results of the Granger causality test reveal no significant interconnection between the Dax30 and the Moscow Stock Exchange Index; the S&P500 affects the Moscow Exchange Index, whereas the Russian stock market affects the Chinese one. According to the cointegration analysis, there is a strong positive influence of the American stock market on the Russian stock market, which does not decrease during the researched period. The stock indices of China and Germany show a weak quantitative influence and mixed dynamics for a long time. The results of the research could be used as recommendations for making management decisions by private investors, hedge funds and managers of large companies.

**JEL Classification Numbers:** C32, C58, G15

**Keywords:** stock markets, Moscow exchange index, cointegration analysis, volatility, Impulse Response Functions.

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## **ASSESSMENT OF THE IMPACT OF INCOME INEQUALITY ON ECONOMIC GROWTH IN RUSSIAN REGIONS**

**Rogneda Vasilyeva<sup>1</sup>, Oleg Mariev<sup>2</sup>, Elena Ignatieva<sup>3</sup>, Alla Serkova<sup>4</sup>**

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**Abstract:** Inequality in the distribution of income of the population has a certain impact on different aspects of the economic and socio-cultural development of countries and regions. This inequality arises due to a number of factors as the current nature of the production specialization, the availability of production and economic infrastructure, the achieved level of development of the social sphere, socio-cultural, demographic, and other factors. The main objective of this study is to assess the nature and extent of the impact of income inequality in the Russian regions for the subsequent justification of the directions of socio-economic development. We conducted an econometric analysis of the impact of intraregional income inequality (the Gini coefficient), fixed capital investment per capita, and average per capita consumer spending on one of the main indicators of regional economic growth (GRP) per capita was carried out. The model is based on panel data for the period 2012-2018 for 85 regions of the Russian Federation. The results of the study confirm two of three hypotheses. As prospects for further research, it is proposed to consider the impact of inequality in the distribution of household income on economic growth for different groups of regions, including resource-type regions and regions with a predominance of manufacturing industries, as well as for leading regions and regions with a relatively low level of socio-economic development.

**JEL Classification Numbers:** O15, I24

**Keywords:** region, income inequality, economic growth, physical capital, human capital.

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## THE IMPACT OF LENDING TO NON-FINANCIAL CORPORATIONS ON ECONOMIC GROWTH

**Rogneda Vasilyeva<sup>1</sup>, Oleg Turygin<sup>2</sup>, Olga Ie<sup>3</sup>, Maria Kozlova<sup>4</sup>**

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**Abstract:** Acceleration of economic growth, especially in modern conditions, requires the use of stimulating measures of fiscal and monetary policy. Measures to stimulate economic growth should also maintain macroeconomic stability. Many emerging markets and developing economies are pursuing high interest rate policies to curb inflation, but this leads to a reduction in lending to non-financial corporations and to economic growth rates decline. The goal of the study is to show that pursuing high interest rates policy is insufficient. We tested several hypotheses: first, we assume that an increase in lending to non-financial corporations stimulates economic growth. Our second hypothesis, in contrast, suggests that increasing interest rates on loans dampen economic growth. Third, we assume that inflation has no significant effect on economic growth. Forth, we consider that lending to non-financial corporations does not spur inflation. We empirically assess the data for 13 countries related to emerging markets during 2001–2020. The results of the research confirmed all the hypotheses. The monetary policy of maintaining high interest rates used by many developing countries leads to low lending to non-financial corporations and reduced economic growth. We propose several policy implications aimed at stimulating the lending to non-financial corporations and scarce inflation.

**JEL Classification Numbers:** E22, E52, F43

**Keywords:** lending, non-financial corporations, economic growth, inflation

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## YOUTH UNEMPLOYMENT IN EUROPE – BUSINESS CYCLES, CRISES, AND POLICY RESPONSES

Albena Vutsova<sup>1</sup>, Martina Arabadzhieva<sup>2</sup>, Todor Yalamov<sup>3</sup>

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### Abstract:

**Purpose:** The goal of the paper is to analyse in which countries' youth unemployment is statistically pro or countercyclical and how crises in the last decade have affected it. What would the plausible explanations for diverging patterns within the EU and other European countries be? In what terms is the young people's labour market across Europe imbalanced?

**Methodology:** The paper builds on Gontkovicova et al.'s (2015) analysis of correlations between GDP growth and youth unemployment on an annual basis by adding more indicators and considering the quarterly basis as well. The quantitative approach is enriched by qualitative insights on Southeast European countries studied within the Erasmus+ YouthCap project (CRA, 2020).

**Findings:** Most of the countercyclical youth unemployment trends in the last 20 years are observed in Eastern European countries (Bulgaria, Hungary, Poland and Slovenia). From Western European countries Iceland, Denmark and Portugal are countercyclical. The most resilient countries in terms of COVID-19 are North Macedonia, Serbia, Turkey and Iceland, which were able to reduce youth unemployment during the coronavirus crisis (Q3 in 2019 and 2020). Plausible policy reactions have been identified based on the concept of learning societies and the need for continuous education.

**Practical implications:** The paper argues why localised policy responses could be more effective than a centralised solution. However, increased coordination and standardisation of secondary and higher education could lead to increased youth labour migration.

**Originality/value:** The paper combines a more traditional quantitative approach to the most recent data series with the qualitative approach of identifying various micro-trends by looking at selected outlier countries.

**JEL Classification Numbers:** J64, J68

**Keywords:** Public policy; Labour market; Youth unemployment; GDP

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## USAGE OF ADVANCED DATA ANALYSIS IN AUSTRIAN INDUSTRIAL COMPANIES

Martin Wallner<sup>1</sup>, Tomáš Peráček<sup>2</sup>

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**Abstract:** Data has become one of the most valuable resources for companies. The large data volumes of Big Data projects allow institutions the application of various data analysis methods. Compared to older analysis methods, which mostly have an informative function, predictive and prescriptive analysis methods allow foresight and the prevention of future problems and errors. This paper evaluates the current state of advanced data analysis in Austrian industrial companies. Furthermore, it investigates if the advantages of complex data analyses can be monetarized and if cooperate figures such as the turnover or company size influence the answers of the survey. For that reason, a survey among industrial companies in Austria was performed to assess the usage of complex data analysis methods and Big Data. It is shown that small companies use descriptive and diagnostic analysis methods, while big companies use more advanced analytical methods. Companies with a high turnover are also more likely to perform Big Data projects. On an international comparison for most Austrian industrial companies, Big Data is not the main focus of their IT department. Also, modern data architectures are not as extensively implemented as in other countries of the DACH region. However, there is a clear perception by Austrian industrial companies that forward-looking data analysis methods will be predominant in five years.

**JEL Classification Numbers:** L60, O32, O52

**Keywords:** Big Data, data analytics, predictive analysis, prescriptive analysis, industrial companies

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## **OBSTACLES OF ORGANIZATIONAL DEVELOPMENT - ANALYSIS OF OBSTACLES AND NECESSARY COMPETENCIES AND METHODS FOR SUCCESSFUL IMPLEMENTATION**

**Andrea Weigold<sup>1</sup>**

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**Abstract:** In order to keep up with the new requirements of a market or a business environment, organizational developments are a necessary change to align the company with the future. Every change in the company is associated with various obstacles, ranging from the difference between the current and the new business model to the employees' acceptance of the organizational development. In order to follow the new vision of the company, structured and extensive communication and structured planning of the implementation is required, in which every stakeholder has to be involved. The change that the organization implements must be accompanied by methods and models and thus learn in the development phase how to avoid obstacles and rejection to arouse motivation and interest so that uncertainties are prevented. Different methods are listed and evaluated in their implementation and content for a possibility for the change. The main focus is on the employees because without the acceptance of the most important stakeholders in a company, no further development is possible. If the employees do not support the vision, the change will fail. In order to accompany a successful development of the company, some necessary competencies and skills are listed, which are to be imparted by the company management and which the employee must acquire. This structured and modeled procedure is intended to accompany and enable change in a company.

**JEL Classification Numbers:** M1/M12/M54

**Keywords:** Organizational Development, Change Management, Analysis, Methods, Competencies.

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## THE RELATIONSHIP BETWEEN JOB SATISFACTION AND INDIVIDUAL PERFORMANCE OF IT EMPLOYEES

Irina Yanchovska<sup>1</sup>

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**Abstract:**

**Purpose** – The main purpose of this research paper is to investigate the correlation between job satisfaction of employees in the IT sector and their personal performance. Additionally, the study examines the overall level of employee satisfaction, as well as if job satisfaction levels differ significantly among the studied demographic groups.

**Design/methodology/approach** – The research is based on quantitative analysis of data collected through a questionnaire containing answers of 126 international respondents from over 25 different IT companies. The research methods used are one-dimensional methods for preliminary analysis, Cronbach alpha for reliability and consistency, one-way ANOVA for mean values comparison and correlation analysis for examining relationships.

**Findings** – The findings show a moderate statistically significant correlation between job satisfaction and employees' personal performance, which is bidirectional as influence and presumably depends on other variables like work engagement, motivation, stress or exhaustion, which were not examined in the current study. Additionally, most of the employees in the researched sample define themselves as satisfied with their jobs. Statistically significant variation of the mean job satisfaction levels was observed in two of the examined demographic variables – gender and years in the current position.

**Practical implications** – The research results can be beneficial for different organizations since job satisfaction is important for employees' long-term retention, for increasing their commitment and loyalty towards the organization, as well as for the creation of a motivating and productive work environment. Employees' job satisfaction and their personal performance should always be considered main organizational values and key for achieving excellent business results and market leadership.

**Originality/value** – The results of the current research are important for validating the position of these researchers, who claim that a positive correlation between an employees' job satisfaction and their personal performance in the workplace exists and should not be neglected. Additionally, it contributes towards a better understanding of job satisfaction among IT employees.

**JEL Classification Numbers:** J28 M12, M54

**Keywords:** job satisfaction, individual performance, IT employees, IT industry

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## FEASIBILITY OF TECHNOLOGY ENTREPRENEURSHIP AMONG BULGARIAN STEM STUDENTS: THE ROLE OF UNIVERSITY

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Irena Mladenova<sup>5</sup>

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**Abstract:** Technology entrepreneurship involves the creation of a new business whose products and services are based on the application of scientific or technological knowledge. Technology entrepreneurship may play an important role for economic development in the context of increasing globalization. Little research attention has been devoted to the antecedents of the feasibility of technology entrepreneurship. The objective of this study is to identify university determinants of the feasibility of technology entrepreneurship among students enrolled in majors in the fields of science, technology, engineering and mathematics (STEM) in Bulgarian universities. The study uses a sample of 879 university students in STEM majors and applies a binary logistic regression to identify university factors related to the high feasibility of technology entrepreneurship. The results of the present study indicate that university support for entrepreneurship, industry ties and research excellence are related to the feasibility of technology entrepreneurship among Bulgarian STEM students. The empirical findings can help to devise policies and measures for enhancing the feasibility of technology entrepreneurship among STEM students.

**JEL Classification Numbers:** O15.

**Keywords:** technology entrepreneurship, feasibility, university, STEM students.

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## **2 – SOCIAL SCIENCES**

## COMPARATIVE ANALYSIS OF THE EXPERIENCE OF LONELINESS BETWEEN BULGARIANS AND RUSSIANS

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Marina Petrash<sup>5</sup>, Yuliya Chankova<sup>6</sup>

**Abstract:** Loneliness is a painful and alienating experience, which is an increasingly widespread phenomenon all over the globe. However, this phenomenon is perceived and interpreted differently in the world. The present study aims to compare the emotional, social, and romantic loneliness between Bulgarians and Russians. The two Slavic countries are historically and culturally close, but at the same time, there are many differences. Some studies have found that in the minds of both Russian and Bulgarian young people, loneliness is associated with both negative and positive aspects. This creates a common ground for the analysis and interpretation of this phenomenon in both countries. But the Russian people are more characterized by a positive-resource view of loneliness, while Bulgarian young people emphasize the negative. The study involved 608 people from Bulgaria and Russia aged 18-73 years. They completed the short version of the Social and Emotional Loneliness Scale for Adults by Di Tommaso E., Brannen C., Best L.A. (2004). The results indicated that „romantic loneliness“ was the most pronounced and present with its frequency in the content of the overall experience of loneliness. This outlines deficits, expectations, and emotions that are realized / function / in the deeply personal world of the person, of the studied groups of adults both in Bulgaria and in Russia. In second place in terms of its representation is the "social loneliness", which stands out among the studied adults from Bulgaria according to its marginal values. In the third place as third structural-content component is the "emotional loneliness", which is especially present in the experiences of the respondents from Bulgaria in comparison with those from Russia. Statistically significant results on the factors "country", "age" and "marital status" are also discussed.

**UDC Classification:** 005, 378

**Keywords:** loneliness, differences, Bulgarian, Russian example

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## **POTENTIAL OF OVERLOOKED INDUSTRY HERITAGE IN HOREHRONIE REGION IN SLOVAKIA AND ITS REGENERATION**

**Veronika Aschenbrierová<sup>1</sup>**

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**Abstract:** The territory of Slovakia is rich in places with an ironworks history, which formed important urban and economic centers in the past. The valuable urban-architectural settlements emerged due to favorable geographical conditions, availability of forest and water resources. Currently, these important historical spots find themselves in the regions suffering from lack of job opportunities and low level of life quality. The research work deals with one of the most important 19th century's Slovak ironworks, its urban and architectural values in the setting, and regenerative activities involving development activities to preserve the constantly overlooked part of Horehronie's cultural heritage. This study aims to contribute to the knowledge about the ironwork complex, to present its current state and research, which has stimulated interest in the protection of so far degrading industrial heritage. The result of this work is to show potential of industrial heritage in regional development and tourism, which is an opportunity to strengthen the region identity, its competitiveness, as well as to the potential of industrial heritage in regional development and tourism, which is an opportunity to strengthen the region identity, its competitiveness, and improve the socio-economic conditions of its inhabitants.

**UDC Classification:** 711

**Keywords:** industry heritage – Coburg - rural – regeneration – development – tourism

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## **COMMUNITY ENGAGEMENT IN SCHOOLS: A GROUNDED THEORY TO UNDERSTAND IN-SERVICE TEACHERS' PRACTICES**

**Gabriela Monica Assante<sup>1</sup>, Mariana Momanu<sup>2</sup>**

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**Abstract:** This exploratory study is guided by the underlying importance of in-service teacher practices in the development of students' community engagement. The main objective is to highlight, describe and understand the role of teachers in the development of community engagement by employing the Grounded Theory methodology. Thirty teachers from urban areas and with at least five years of experience were interviewed to investigate their perspective, approach and practices in promoting community engagement in school settings. The Grounded Theory method was employed in order to develop a descriptive model of the role of teachers in the community engagement development process. Following the open, axial and selective coding process, a theoretical explanation of the process emerged that highlights the pre-conditions of promoting community engagement, conceptualizes the phenomenon, and displays the challenges and educational practices employed. Several categories and sub-categories of the process elements were identified and illustrated by qualitative data. Further, the educational implications of the findings are thoroughly discussed.

**UDC Classification:** 37.04

**Keywords:** community engagement, in-service teachers, community approach, grounded theory

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## **INFLUENCE OF DISTANCE LEARNING ON THE ACADEMIC MOTIVATION OF STUDENTS FROM SPECIALTIES IN THE FIELD OF ARTS**

**Liliya Babakova<sup>1</sup>, Tsvetana Kolovska<sup>2</sup>, Konstantina Konstantinidu<sup>3</sup>**

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**Abstract:** This article discusses the problem of the impact of distance learning on the motivation to learn in students studying arts. Learning arts such as music, dance, and fine arts via distance learning is proving to be a real challenge for students and teachers. The aim of the present study is to determine how distance learning affects the learning motivation of students studying art at the university.

**Method:** a questionnaire for measuring academic motivation and a modified scale for measuring students' engagement in online learning, and a survey.

**Sample:** 109 students from first to fourth-year in university, studying specialties related to music, fine arts and dance

**Results:** The results showed that distance learning did not prove to be a major obstacle in establishing the learning material, but students who are internally motivated to learn prefer traditional learning. The main difficulties in distance learning turned out to be technical - the use of too many and different learning platforms, lack of a good internet connection, organizational - time management difficulties, easy distraction and psychological factors such – overwhelming written information, the high demands of the teachers, and a lack of social exchange. Correlation analysis found that students who prefer traditional education have a high intrinsic motivation to study art-related disciplines. ANOVA did not establish statistically significant differences in the factors, course and specialty.

**UDC Classification:** 378

**Keywords:** distance learning, motivation, student, art

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## SPANISH LANGUAGE ACQUISITION IN TERTIARY EDUCATION: THE ACTUAL SITUATION IN LATVIA

Agata Babina<sup>1</sup>

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**Abstract:** The data published by The Instituto Cervantes (2021) prove that Spanish language use in the world is constantly rising. The current number of native speakers is 489 million people, and there are more than 22 million learners worldwide. It is the fourth most spoken language in the EU and the third in the UN. The newest Latvian Educational Standard states that the first and second-level educational institutions should offer a minimum of two foreign language acquisition. Nevertheless, the Latvian Educational Curriculum does not include Spanish as an option; therefore, it lacks institutional support to establish Spanish studies in all educational levels with the proper follow-up. The article presents the current situation in various study programs proposed by several Latvian tertiary education institutions in 2020/2021. The data has been collected by contacting current Spanish lecturers and analyzing the current study programs offering Spanish language acquisition in tertiary education institutions mentioned in the article. The analysis presents the content of the study programs in the bachelor and master study levels and the estimated number of students in each study program. It is a panoramic insight into Latvia's Spanish language teaching situation, which is necessary to understand Latvian-speaking Spanish learners' needs, existing resources for Spanish language teaching, and a further perspective for promoting Spanish studies in Latvia. It proves a lack of institutional cooperation to provide the constant Spanish language acquisition from the first till the tertiary educational level that would improve the general recognition of Spanish and its need in Latvian society as a part of the European Union.

**UDC Classification:** 811.134.2

**Keywords:** Spanish acquisition, tertiary education in Latvia, Educational Curriculum

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## **ATTITUDES TOWARDS SAME-SEX PARTNERSHIP: A SOCIOLOGICAL RESEARCH OF YOUNG PEOPLE IN SPLIT (CROATIA)**

**Gorana Bandalović<sup>1</sup>, Zorana Šuljug Vučica<sup>2</sup>, Ines Uvodić<sup>3</sup>**

**Abstract:** One of the current dilemmas of modern society is how to look at homosexuals, same-sex partners, forming same-sex partnerships, and raising children in such communities. Homosexuals are classified as sexual minorities and are often excluded from society, which is not new because members of sexual minorities have long been accompanied by numerous persecutions and repressions. This paper aims to examine the attitudes of young people towards homosexuality and same-sex partnership. The paper presents the results of the research conducted in 2019 using a survey method on a sample of 303 respondents aged 15 to 35 years. The results show that most young people do not consider homosexuality to be a disease and approach LGBT people in the same way as the rest of society, not paying attention to someone's sexual orientation. Respondents are predominantly open to the possibility of marriage between same-sex partners while they to a lesser extent agree with the adoption and upbringing of children by same-sex partners. They believe that there is a difference in the upbringing of children raised by same-sex partners from children raised by heterosexual partners, which can be justified by the discrimination and violence to which children of same-sex partners are exposed to. Also, young people think that homosexual parents can be good parents and provide their children with everything they need and that it is better for children to grow up in same-sex families than in homes for abandoned children. Although they state that such communities are almost equal to heterosexual communities, they are aware of their exposure to social exclusion.

**UDC Classification:** 316.36

**Keywords:** same-sex partnership, youth, children, sociological research.

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## INNOVATIVE POLICY IN THE FIELD OF PERSONNEL TRAINING IN THE CIVIL SERVICE

Alexey Baranov<sup>1</sup>, Olga Kotlyarova<sup>2</sup>, Alexey Tagaev<sup>3</sup>

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**Abstract:** The hypothesis of the presented article is the idea that the innovation policy in the field of public administration personnel training is based on two principles: 1) training of personnel of a new format, corresponding to the requirements of reality and ready for quick and not always anticipated changes, 2) careful attitude to the human resource, that is, the human potential of the public administration system. The introduction describes the archaic system of Russian personnel policy. The introduction of relevant principles into the state personnel policy will improve the professional competencies of employees, adapt them to the process of changes in public administration, and allow interested employees to plan and build a career perspective. The formulated principles are a consequence of the teamwork of the educational organization and government authorities in order to understand new staffing requirements for the public administration system. These principles include the principle of corporate training, the principle of customizing educational content, the principle of personalizing additional professional programs, the expert principle, the principle of innovative methodology, the blended format principle, the motivational principle, the principle of independent assessment of the quality of training of students, the principle of independent assessment of the quality of conditions, the principle of internal evaluation systems, analysis principle. In conclusion, the author substantiates the statement that it is necessary to expand the range of fundamental principles in connection with the openness and dynamism of the structure of innovative personnel policy.

**UDC Classification:** 351

**Keywords:** innovation policy, personnel policy, additional professional education.

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## ENGAGEMENT AND INVOLVEMENT OF PERSONNEL DURING REMOTE WORK

Solveiga Blumberga<sup>1</sup>, Laura Lapkovska<sup>2</sup>

**Abstract:** The COVID-19 pandemic has altered the majority of the world's organisations through making remote work a part and parcel of everyday life. The number of people working remotely has increased substantially creating a challenge for the organisations to manage and involve their personnel. Engagement and involvement of the personnel are major factors contributing to a positive outcome of the remote work processes. The aim of this research paper is to establish what the engagement and involvement of the personnel are while practising remote work in the Latvian financial institutions. This research paper put forward the following issues for exploration: what is the engagement of the financial institutions' personnel in their work while working remotely? What is the involvement of the financial institutions' personnel in their work while working remotely? Is there a link between engagement and involvement of the financial institutions' personnel during remote work? This paper explores the definitions of engagement and involvement by various authors and many forms of remote work putting emphasis on expansion of remote work due to the pandemic. The research made use of 3 surveys: a survey on the engagement of personnel during remote work, a survey on involvement of the personnel during remote work and a survey on the personnel's opinion on remote work compiled by the authors of this research paper. There were 98 full-time employees of financial institutions participating in the research who were transferred from office jobs to a form of remote work during the COVID-19 pandemic. The results of the research demonstrate that only a fraction of the financial institutions' personnel were engaged and involved during their remote work and that institutions had to resort to additional measures in order to promote involvement and engagement of the rest of the personnel and attain better operational results. The major problems highlighted by the results of the research are: insufficient internal information exchange and co-operation. The personnel feel responsible for the performance of their work, but admit to lacking inspiration that would foster their engagement. They also acquired negative experiences while working remotely. The results of the research identify a need for further research on the significance of the internal culture and communication of financial organisations for the promotion of involvement and engagement of personnel during remote work.

**UDC Classification:** 331.1

**Keywords:** employee engagement; employee involvement, remote work.

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## IMPACT OF SOCIO-CULTURAL TRANSFORMATION IN THE COMMUNICATIVE DESIGN IN GALICIA

Olha Borysenko<sup>1</sup>, Stanislav Mygal<sup>2</sup>

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**Abstract:** The development of information and communication technologies has determined their spreading in the design of the visual information environment of human activity. This was the main reason for this research — the search for the starting points of the communicative design in Galicia as the phenomenon of artistic-project culture and examining it. The methodological basis of the paper includes interdisciplinary and system approaches in solving the assigned tasks.

The comparative historical analysis and the culturological method has been used to analyze socio-cultural processes in Galicia. This paper analyzes the historical and socio-cultural preconditions for the formation and development of design in Galicia. This paper observed that public organizations, industrial committees, associations, educational and cultural societies have a salience role in improving the design of industrial products. The graphic design of printing products, advertising style, photo, and film productions models the communication characteristics and identity of the graphic design objects.

The result of the probability of design in Galicia was obvious due to the activity of artists, whose graphic design works created harmonious communicative encirclement of human activity.

The complexity of the language of European aesthetics and the sources of national creativity of the Galician masters constituted the paradigmatic basis of communication design. An integral communicative and multifaceted process in the context of socio-cultural transformation consolidated the phenomenon of formation and development of design in Galicia..

**UDC Classification:** 655.26:7.012.185](477.83/.86)"18/19"

**Keywords:** communication design, communication space, Galicia, objects / subjects of graphic design, sign-code.

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## SOCIO-EDUCATIONAL CORRELATES OF BULLYING IN THE SCHOOL CONTEXT

Simona Butnaru<sup>1</sup>

**Abstract:** Bullying is an increasingly common problem in schools, associated with negative educational outcomes for both bullies and victims. This study explored the socio-educational family and school variables related to bullying, victimization and positive behavior, such as age, gender, separation from parents, school results, and truancy. In this study 311 students (50.8% boys) have participated, they were aged between 6 and 16 years ( $M = 11.01$ ,  $SD = 1.71$ ), enrolled in primary school (47.3%) and in secondary school (52.7%), all were from urban areas. 43.8% of respondents were separated from one or both parents due to divorce (17.4%), parental death (6.1%), migration (20%) or abandonment (0.3%). Bullying, victimization and positive behavior were measured with one standardized scale; the data about school results and attendance of the students was collected from the school registers; family information was self-reported by participants. Because Cronbach's Alpha for the positive behavior scale was 0.57, lower than 0.7, this scale was not considered for further data analysis. Empirical data for the study was collected before the outbreak of the COVID-19 pandemic.

The Mann-Whitney  $U$  test showed significant age differences: secondary school students scored higher in aggression than primary school students. We also found significant gender differences in bullying behavior: boys' reported higher level of aggression. The Independent Sample Student's  $t$ -test indicated gender differences in school results: the boys obtained lower school results in Language and Mathematics than the girls. Separation from one or both parents did not lead to significant differences in bullying behavior, but pupils separated from their parents had fewer school absences than their colleagues not separated from their parents. Pearson's correlation indicated that students with higher bullying scores, also scored higher on victimization and had higher number of school absences, but had scored lower grades in Language and Mathematics. One-way ANOVA indicated that victimization was influenced by age and bullying was influenced by gender. Also, one-way ANOVA indicated an effect of bullying on school results. Two-way ANOVA showed an interaction effect between gender and separation from parents on bullying. When living with both parents, boys had higher bullying scores, but under separation condition, the boys scored slightly lower than girls. The implications of the results for education and counseling are discussed.

**UDC Classification:** 37.06

**Keywords:** bullying, victimization, separation from parents, truancy, school outcomes

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## REPRESENTATION OF THE USA IN THE CONTEXT OF IMPERIALISM IN THE PROPAGANDA POSTERS PUBLISHED IN THE PEOPLE'S REPUBLIC OF CHINA

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**Abstract:** A negative process started in Sino-USA relations after establishing the People's Republic of China (PRC), PRC made policies against the USA, which it accused of being imperialist. Tensions between China and the USA led to the presentation of the USA to the masses as an imperialist country and the national enemy of Chinese people in Chinese media. The study tried to reveal how the USA was presented to the masses and through which messages it was built as an enemy country in the context of imperialism in anti-US posters in China. For this purpose, 8 posters determined within the scope of the study were analyzed in the light of the German linguist Karl Bühler's Organon Model, using the semiotic analysis method. As a result of the study, it was claimed in the posters that the USA had imperialist goals and led to war to achieve these goals. For this reason, the message that the imperialist aims of the USA posed a threat to both China and world nations, and world nations must act against the USA in order to end the danger posed by the USA was given. Thus, the Chinese administration tried to legitimize the anti-USA policies implemented during the Cold War.

**UDC Classification:** 327.2, 327.5, 327.8

**Keywords:** China, media, culture, USA, imperialism, representation.

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## VERBAL REPRESENTATION OF THE INDIVIDUAL AUTHOR'S EMOTIONAL CONCEPT JOY

Evgeniya A. Chuksina<sup>1</sup>, Liudmila V. Babina<sup>2</sup>

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**Abstract:** The article deals with the role the individual author's emotional concept JOY plays in the plot formation of the literary work. The aim of the paper is to determine how the representation of the JOY concept reflects the key conflict in the novels "White Fang" and "The Call of the Wild" by Jack London and in the novels "Of Human Bondage" and "The Moon and Sixpence" by W. Somerset Maugham. In order to reach the aim, we use the following methods: conceptual, contextual, definitional analyses, and cognitive modeling method. The methodology for conducting the study involves 1) the identification of the conflict of the literary works reviewed; 2) the analysis of the primary, secondary and implicit representation of the JOY concept in these works; 3) the determination of what plot element and in what way is expressed in the language and what hidden information is given by the verbal representation of the JOY concept. Thus, the research results manifest themselves in the detection of two similar oppositions: the North-South opposition is found in the novels by Jack London and the Genius-Philistine opposition is in the novels by W. Somerset Maugham. We come to the conclusion that the verbal representation of the JOY concept illustrates the similarities and differences between the categories "North", "Genius", "South", "Philistine" which are based on the characters' attitude towards the key elements of the conflict formation, which are freedom, love, religion, success, self-expression, new experience, welfare.

**UDC Classification:** 811.111

**Keywords:** emotion, concept, JOY, representation, London, Maugham, opposition, category

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## HANDLING MULTI-LEVEL CLASSES IN THE CITY OF BATUMI

Ivdit Diasamidze<sup>1</sup>, Lali Tavadze<sup>2</sup>, Natia Katamadze<sup>3</sup>

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**Abstract:** If we take into account the common teacher-centered or the one-book-fits-all approach, where the teacher is forced to focus on the middle level, many students at the top or bottom end of the language scale are left dissatisfied or demotivated. Once students are placed into a certain class they are regarded as being at much the same linguistic level in their foreign language, and a one-book-fits-all approach is often adopted in the classroom, where all students are required to work at the same pace and complete the tasks of the same difficulty. There are various scholarly approaches to the problem. This study aims to determine whether teachers are aware of possible techniques like differentiated work, dividing a class, letting students choose the task, other techniques, and what the frequency of their use is.

The survey was carried out among the teachers working at both higher education institutions and secondary schools to find out how often teachers refer to different techniques.

The results suggest that differentiated work requires much and thorough preparation on the part of a teacher, which becomes quite time-consuming at times. Therefore, teachers try to deal with mixed-level classes using mostly class division into groups or pairs. Moreover, teachers sometimes or almost rarely let their students choose what to do. A few teachers apply other techniques in their mixed-level classes. This discussion results in the following outcome – there is still the need to raise teachers' awareness of the techniques to deal with students of different needs in class.

**UDC Classification:** 376

**Keywords:** mixed-levels; mixed-abilities; differentiated instruction; learning types; student-centered approaches.

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## EXPLORING OPPORTUNITIES FOR THE RETURN OF BULGARIAN MIGRANTS IN RESPONSE TO THE GROWING NEED FOR SPECIALIZED STAFF IN SOFIA

Joanna Dragneva<sup>1</sup>, Maria Popova-Hristova<sup>2</sup>

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### Abstract:

This article examines the issues related to Bulgarian migration after the country acceded to the EU in 2007 and focuses its research on the phenomenon of “brain drain” – the process of mass emigration during which specialists, scientists and skilled workers leave. Today, this phenomenon is quite typical for Bulgaria as part of the former socialist countries of Eastern Europe. The problems associated with the “brain drain” are very relevant as the country suffers significant economic and cultural losses while the host countries acquire large and inexpensive intellectual capital.

During the years of transition, Bulgaria strives to be a full member of the EU and provide opportunities for development and realization of specialists, scientists, and researchers. This requires the adoption of measures and initiatives to establish sustainable development in the capital and in the country and meet the need for highly skilled labor in the industrial sphere.

The article aims to explore the possibilities for the return of Bulgarian migrants in response to the growing need for specialized staff in Sofia. The quantitative study involved more than 500 Bulgarian migrants residing in different host countries, selected randomly and responded voluntarily.

The article defends the thesis that if Bulgaria provides opportunities to develop specialized staff through the undertaking of specific initiatives, this can be an attraction and a motive for the return of Bulgarian migrants.

The study methodology utilizes the quantitative studies model (and, more specifically, the questionnaire method). To obtain more reliable results, their interpretation also includes additional statistical tools. The question whether a correlation exists between the age and the degree of settlement of Bulgarians abroad is of special interest and has been investigated using the Cramér V.

The results show that in recent years the need for specialized staff is constantly growing. In response to this need, the initiatives that are undertaken are aimed at innovations in science and education. The study also takes into account the readiness of Bulgarian migrants to return home.

**JEL Classification Numbers:** J61, O15, O32

**Keywords:** research, initiatives, migration, innovation

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## HEALTH ETHICS AND POLICY DURING THE COVID 19 PANDEMIC CASE STUDY SANDZAK

Suada A. Džogović<sup>1</sup>, Anela Džogović<sup>2</sup>

**Abstract:** The paper provides a comprehensive overview and critical review of current public health problems in Sandžak observed through the prism of ethnicity. The aim is to determine the extent to which minority communities are adequately informed about the events related to the pandemic COVID 19. First of all it is necessary to point out the events during the COVID 19 pandemic, and to improve information in detecting, preventing and combating problems that have arisen as a result of unethical and irresponsible health sector in this region.

History shows that epidemiological diseases and mortality rates are higher for the ethnic minority population during pandemics than for other populations. Therefore, addressing the needs of vulnerable populations in emergencies should include taking more concrete measures by state institutions to prevent the spread of COVID 19. With the outbreak of the COVID 19 pandemic, the 'infodemia' is spreading, as described by the World Health Organization (WHO). In the context of the growing disinformation activity related to the outbreak of COVID 19, the authors emphasize the importance of raising awareness of the dangers of misinformation by promoting the use of scientific and authoritative sources. The excessive amount of inaccurate information in the health sector of Sandzak, as well as the actions of the executive authorities in "resolving" the pandemic, makes it even more difficult for members of the minority populations in this region to find reliable sources and guidelines to follow during the pandemic. Coordinated disinformation seeks to stigmatize minorities as a potential "cause" of the pandemic in the region, and to boost confidence in central governments, whose institutions have so far failed to provide effective responses.

Our conclusions confirm that in such an environment of daily increase in the number of infected and dead, politically oriented media further contribute to the public health crisis, with the aim of strengthening the interests of governing structures, often directly disputing or delaying assistance to Bosnia and Herzegovina and Turkey and the EU. Also, the results of the research suggest that the Sandzak health policy process, in addition to faster risk assessment and epidemiological information, should include strengthening strategic communication capacities and cooperation with citizens. Effective risk communication would allow vulnerable populations to better understand the behaviors they must adopt in order to protect themselves. Therefore, authorities and experts should listen to their needs, try to respond to them and make sure that their advice is timely, reliable and effective.

**UDC Classification:** 32:323.1

**Keywords:** Sandzak, COVID-19 pandemic, minority population, health ethics, disinformation, propaganda, policy.

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## THE INFLUENCE OF RELIGIOUS VALUES ON THE DEVELOPMENT OF INTERNATIONAL BUSINESS

Suada A. Džogović<sup>1</sup>, Anela Džogović<sup>2</sup>, Zijad Šabotić<sup>3</sup>

**Abstract:** The aim of this paper is to analyze the role of religion and religious beliefs in shaping the tendency of free trade and to emphasize that the influence of religious beliefs as a basic component of any culture is stronger in developed and weaker in underdeveloped countries. Starting from the assumption that religion determines the ways of establishing relations between members of the same, but also between representatives of different societies, it can significantly determine working and non-working days, attitude towards work, role of women in society, shopping behavior, business expenses in a certain country, etc. However, despite many obstacles, primarily cultural, religious, linguistic, legal-political, but also economic, the market is expanding and becoming international. This type of business internationalization has been particularly noticeable in recent years, as the business expands to more distant and diverse countries. For these reasons, countries with significantly different internal and external environments require a thorough analysis, as this requirement has strong implications and can significantly affect the outcome of international business.

This paper analyzes the realization of goods and services between Bosnia and Herzegovina and countries in the region - Turkey, Albania, Kosovo, Macedonia and other friendly countries, because in the interest of reducing operating costs users and consumers of these countries use the same or similar languages, cultures, acquaintances, and even business security in the markets of these countries. In addition to regional ties, our research confirms that Bosnia and Herzegovina in international business relations is mainly guided by a common religious component that is reflected in all spheres of business. Also, our conclusions confirm that although sociological and empirical analyzes to date show that there is a correlation between religion and economic development, this relationship should not be generalized because not all countries with the same dominant religion place the same restrictions on business. Thus, a coherent understanding of religious values and beliefs can undoubtedly provide a better understanding of economic behavior in international relations. In the case of BiH, the correlation analysis with the countries of the Western Balkans shows that religion significantly influences the trade policy of this country and its relations in the region and beyond.

**UDC Classification:** 33-331.1:339.9

**Keywords:** Bosnia and Herzegovina, international environment, business, culture, religion, internationalization.

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## DISTANCE LEARNING DURING THE COVID-19 PANDEMIC CASE STUDY BOSNIA AND HERZEGOVINA

Suada A. Džogović<sup>1</sup>, Anela Džogović<sup>2</sup>

**Abstract:** The focus of this research is education during the coronavirus pandemic in Bosnia and Herzegovina. It encompasses elementary education, high schools and higher education. The aim of the research is multiple. Main goal of this paper is to determine the quality of online teaching during the COVID 19 pandemic in Bosnia and Herzegovina. With it we want to present methods of distance learning during the pandemics in the country, challenges and advantages that have emerged, as well as potential solutions for removing faults. This is primarily a qualitative research relying on several methods. We conducted interviews to understand experiences of different stakeholders participating in education process. This research also relies on quantitative data, i.e. results of opinion polls and research conducted by Student parliament and the Senat of the University of Sarajevo. Their research was conducted throughout academic year 2020/2021. Also, we compiled different text from media, as well as statements from different stakeholders. Our method is primarily inductive – considering the fact that in some cases general ideas and conclusions about distance learning in Bosnia and Herzegovina are based on different individual examples.

The results of the research show that educational institutions in Bosnia and Herzegovina were not ready for online learning. The most important are technical problems, but also the technical skills of lecturers and their teaching style that was not adequately adapted to the new learning conditions. In addition, lack of interaction and poor communication with lecturers had a negative impact on student learning outcomes at all levels of the educational process. For these reasons, academic institutions should limit the existing problems of online learning and their impact on the learning process and academic success of students.

Therefore, the situation has also brought opportunities for reviewing existing educational models and finding new solutions in schools and universities.

**UDC Classification:** 37.09:378

**Keywords:** Coronavirus pandemic, Bosnia and Herzegovina, distance learning, educational policy, challenges, advantages.

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## LINGUISTIC ASPECTS OF CHARTED KNITTING PATTERNS

Baiba Egle<sup>1</sup>

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**Abstract:** The paper outlines the linguistic and semiotic aspects of a specialty text – a knitting pattern. In today's busy world, nobody wants to read long and complicated texts if it can be easier illustrated by a photograph or a charted image that uses a set of specific symbols with their own, non-arbitrary meanings to make a text reader's time usage more effective but also clear. Aspects of signs, semiotics, and language games are also explored in alignment with knitting charts as the main reference, as a knitting chart symbol is a concrete referent in its context. Finally, the translation of knitting charts is described, including the importance of a chart key and what transformations of text have occurred in the translation of knitting charts from English into Latvian. Chaired knitting patterns could become a that could be easily transferred between different languages and cultures, helping people share their skills and heritage. Knitting and linguistics and translation studies is a new area of research that could bring many new insights about crafting and specialized language use.

**UDC Classification:** 81'33

**Keywords:** knitting, charts, translation, symbol

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## **PECULIARITIES OF THE SELF-CONCEPT IN STUDENTS WITH SPECIFIC LEARNING DISABILITIES**

**Maya Fyodorova-Radicheva<sup>1</sup>**

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**Abstract:** Specific learning disabilities (SLD) in adolescence are a key area for the successful application of the principles of integrated education. However, there are not many studies on the topic, which is a key indicator of the relevance of this study. The study presented in this article aims to detect and analyze the presence of characteristic features in the concept of self in students with SLD in middle school age (from 10 to 16 years of age). In order to establish characteristic features and peculiarities, an adapted version of the Q-sorting methodology was used. This method includes sorting cards with 14 polar personal traits, selected for their accessibility and distinctness for students with SLD. A total of 32 students in secondary schools in the municipality of Plovdiv were studied. 16 of them without a history of disabilities, and the remaining 16 have already been diagnosed with SLD, for which they receive special additional support in the schools where they study. The results show the presence of distinctive and specific differences in some aspects of the self-concept. The most significant differences are in the appraisal of the qualities "Capable", "Clever" and "Silly". The first two qualities are assessed by the students with SLD as less relevant to their real-self, and the third is assessed as much more relevant to their own self-image, in contrast to their classmates without disabilities. This assessment does not show gender or age specifics.

**UDC Classification:** 159.97

**Keywords:** specific learning disabilities, SLD, self-image, dyslexya

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## LEGAL REGULATION OF SUPPORT TOOLS IN SOCIAL ECONOMY AND ITS INNOVATIONS IN THE PERIOD OF COVID-19 IN SLOVAK REPUBLIC

Zuzana Gálisová<sup>1</sup>, Peter Plavčan<sup>2</sup>

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**Abstract:** The 20ties of the 21<sup>st</sup> century are characterized by the pandemic period of COVID-19. The fall of national economies, the fears of inhabitants regarding their health, and the unfavorable economic situation of big groups of inhabitants require functional measures. Implementing social economy principles in national economies is a tool to improve the economic situation of the marginalized groups of inhabitants without using social networks. The knowledge on the social economy system and legal regulation of support tools in social economy in Slovak Republic enable the dissemination of this knowledge and potentially implement in the current pandemic COVID-19 period even in the international environment. The legal regulation of the social economy offers more support tools to solve current economic problems during the COVID-19 pandemic period. Here we present a structured overview and generalization of the knowledge of legal regulations on the social economy as well as a detailed description of the content of the support tools of the social economy during the COVID-19 period.

**UDC Classification:** 346.7, 364-7

**Keywords:** social economy, investment aid, compensatory aid, subsidy, service voucher, support tool

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## **SENSORY-INTEGRATION THERAPY IN THE TREATMENT OF AGGRESSIVE BEHAVIOR IN CHILDREN WITH MULTIPLE DISABILITIES**

**Diyana Georgieva<sup>1</sup>**

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**Abstract:** In recent years, sensory-integration therapy has emerged as one of the most popular treatments for aggressive behavior in children with different disorders. This article is devoted to an experimental study aimed at determining the effects of sensory-integration therapy on the aggressive behavior of children with multiple disabilities. Eighteen children participated in the study. The registration of the children's behavioral responses for 24 consecutive school days allowed the collection of evidence in support of the thesis in the study. The individual child's frequency of aggressive behaviors in four domains was recording on 12 days while undergoing sensory-integrative therapy and 12 days without a treatment with sensory-integrative techniques. The following methods were used in the analysis of the results: Paired samples t-tests to test the four null hypotheses, a Shapiro-Wilk test for the assumption of normality, Cohen's d to determine the effect size attributable to the therapy, and descriptive statistics for the dependent variables. The statistical results indicated a high level of significance for the three variables: aggression towards property, physical aggression, and aggression toward self. The obtained average values for the three modules are evidence for the positive effects of the sensory-based therapy in children with emotional and behavioral problems. The fourth variable, verbal aggression did not show a statistically significant difference between the mean values before and after the sensory-based intervention.

**UDC Classification:** 376

**Keywords:** sensory-integration therapy, treatment, children with multiple disabilities, aggressive behavior.

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## SECONDARY SOCIALIZATION OF CHILDREN FROM HOME EDUCATION

Michal Hanák<sup>1</sup>, Václav Šimek<sup>2</sup>, Kateřina Bočková<sup>3</sup>

**Abstract:** The aim of this paper is to find out how the secondary socialization of children from home education takes place and to map the personal experiences and opinions of parents educating their children at home. The paper is divided into theoretical and empirical parts. The theoretical part deals with the socialization as a necessary process in the life of each individual, we describe the various types of socialization, we deal with a different concept of socialization according to where it takes place, i.e. in the home and school environment. The theoretical part forms the basis for the empirical part. For the implementation of the research, we chose qualitative research using semi-structured interviews, which were conducted with parents who currently have a child or children in home education. According to the results of the research, home schooled children are secondarily socialized in regular and sporadic meetings with other home schooled children, either as part of celebrations and other social events or for the purpose of learning together in a small group of children. Another way are friends with whom they see each other several times a week in hobby groups or visit each other. Furthermore, the family and siblings, play an important role in the socialization process. Due to age differences, siblings can help each other in many ways, learn from each other and spend free time together. The limit of the presented work is a small sample of respondents and the associated impossibility to generalize the results. However, the research went into depth on the topic and brings forward the subjective opinions and experiences of parents. Another limit is the implementation of the interviews through the telephone, which does not allow for the observation of non-verbal expressions of the respondents during the interview, which can reveal a lot.

**UDC Classification:** 37.06

**Keywords:** home education, socialization, child, family, parents, school, teacher.

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## ACTIVE LEARNING THROUGH TECHNOLOGICALLY-BASED DECISIONS

Tsvetelina Ivanova<sup>1</sup>

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**Abstract:** The fourth industrial revolution determined Education 4.0, which brings out both the clear presence of technology in the educational process and connects electronic devices in the real and virtual world during learning, and during activities of interest, according to personal preferences and experience. However, the requirements and conditions for the use of technologies to increase learning outcomes are much more important. The objective of the study is the construct "technology-based decision making". The research aims to study the influence of the technology-based decisions for the active learning of the students from the higher educational institutions /HEIs/. A scientific study was conducted with 74 students from HEIs. The results show that technology-based decision-making increases learning activity and provides opportunities for learning to be a constructive and active process. Technology-based decisions of university students are defined as a specific motivator for their active learning.

**UDC Classification:** 378

**Keywords:** learning, tech-decision, Ed-Tech-decision

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## THE NEED TO REVIEW CULTURAL POLICIES IN BULGARIA

Tsvetomira Ivanova<sup>1</sup>, Vesela Kazashka<sup>2</sup>

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**Abstract:** Cultural policy guarantees freedom of expression, creates conditions for equal participation in the cultural life of the country, preserves and promotes the culture of different ethnic groups and religions, supports education, intercultural exchange and expands intercultural communication. In this context, the influence of European cultural policies on national ones is of particular importance for the development of art and the preservation of cultural values. The choice of priorities, goals and tasks, a good set of measures, funding mechanisms, accessibility to citizens, their recognition by society are of particular importance and favors the development of culture. In the context of the social isolation caused by COVID-19, cultural policies need to be updated. This report is based on an analysis of statistics relating to the expenditure on culture and the arts at the European and national level, a comparative analysis of European cultural policies and their impact on national ones. The obtained results outline guidelines for the development of cultural policies at the regional level and can be a basis for practical application and further research in this direction.

**UDC Classification:** 304

**Keywords:** cultural policies, art, culture

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## ONTOLOGY OF THE BULGARIAN CULTURAL HERITAGE. BULGARIAN FOLKLORE

Tsvetomira Ivanova<sup>1</sup>, Iva Nedeleva<sup>2</sup>

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**Abstract:** This article presents the creation of an ontology describing Bulgarian folklore. The ontology has been developed based on the CCO (Cataloging Cultural Objects) standard. CCO leads us to provide data content standards. The set of ontologies is a knowledge base used by intelligent agents. One of the main problems with systems and developments describing different cultural and/or historical sites is the difficulty in sharing information between individual societies or systems. The use of standards greatly facilitates the dissemination of data. The CCO standard provides clear and precise definitions of the individual attributes that an object must possess. The ontologies developed by Protégé are designed in such a way as to meet the requirements of the standard. The created ontologies describe 7 folklore areas with specific ones being: music, dances and musical instruments. The work on creating this ontology directs us to create web applications of the developed ontologies.

**UDC Classification:** 004.22

**Keywords:** Bulgarian musical folklore, ontologies, CatalogingCulturalObjects standard (CCO), knowledge data base

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## MULTIMEDIA PRESENTATIONS AND TEACHING ABOUT THE WORLD AROUND US, MAN AND NATURE, AND MAN AND SOCIETY IN GRADES 1 - 4

Vanya Ivanova<sup>1</sup>

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**Abstract:** The article aims to justify and elucidate the role of multimedia presentations in learning about the world around us. Multimedia presentations accompany early training aimed at the child's natural and social environment. They are systematically used due to the visual nature of the predominant learning material, which quite often combines illustrative and educational functions.

This article focuses on the didactic use of presentations in lessons and its methodology. The objective of this research is to establish which didactic tasks are performed with the help of multimedia presentations in lessons.

The results in the areas studied show that there is no single unified method for using multimedia presentations in the lessons on the surrounding world. In practice, different approaches are used, which, in some cases, are incompatible with the traditional teaching procedure.

**UDC Classification:** 37.01.

**Keywords:** multimedia presentation, training for the surrounding world, methodology of the training for the surrounding world.

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## COMPETENCIES OF PHYSICAL EDUCATION TEACHERS IN CONDUCTING ONLINE EDUCATION

Veselina Ivanova<sup>1</sup>, Eleonora Mileva<sup>2</sup>

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**Abstract:** The state of emergency, as a result of the COVID-19 pandemic, has completely changed the education system in Bulgaria, including the training of physical education and sports in Bulgarian schools. Physical education and sports training have been transformed into distance and online education and training. The aim of the research was to study the competencies of PE teachers in the country for the implementation of online teaching. The subject of the study was a total of 138 teachers, of whom 100 (72.5%) were female and 38 (27.5%) were male. The teachers were aged from 24 to 68 years old, with different pedagogical experience and were representatives of all regions of the country. A specially developed international questionnaire with closed questions was applied. Alternative analysis and chi-square Pearson's test ( $\chi^2$ ) were used to analyze the results. The results show that the sampled teachers evaluated the current use of online education in physical education and sport as relatively good (47.1%). At the same time, the acquired results show that the educational activity of sports pedagogues during the pandemic has reduced their motivation for professional activity (43.5%). Teachers have rated as very good (29.7%) and good (45.7%) their competencies for using online technologies to conduct physical education and sports classes. The majority of them – 79%, actively applied the new technologies in the training process. No differences were found in the answers of the respondents to any of the questions on the criteria of gender, age and pedagogical experience.

**UDC Classification:** 37.09

**Keywords:** PE teachers, online teaching, competencies, technology, pandemic

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## LONELINESS AND PREDICTIVE MODELS OF MULTIPLE RISK BEHAVIOR OF ADOLESCENTS IN THE CONTEXT OF ECOSYSTEM METATHEORY AND VIRTUAL INTERNET SPACE

Ján Kahan<sup>1</sup>, Žiaková Eva<sup>2</sup>

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**Abstract:** The metatheoretical ecosystem construct requires integrating the virtual dimension of the internet in the assessment of human living space.

**Objective:** The main goal of the present study is to identify possible relationships between loneliness, risk behavior in the use of psychoactive substances of adolescents, based on the ecosystem meta-frame of living space (which also reflects virtual space), as one of the essential factors in the emergence and development of addiction. Based on this, an effort is made to compile predictive models of multiple risk behaviors concerning the use of psychoactive substances.

**Methods:** Loneliness is determined using the OESL questionnaire (Gierveld & Tilburg, 2021). The RSi questionnaire examines risk behavior (Kahan et al., 2021; Lovašová, 2021). Multiple linear regressions construct predictive models, and subcategories are subjected to correlations and parametric tests. At the same time, data on adolescents' loneliness are compared with data on the loneliness of addicted adult respondents and data on abstainers from another research.

**File:** The representative sample consists of 744 respondents in the second and third years of secondary schools in the Slovak Republic, of which 263 are men and 481 women. The research file of addicted respondents consists of 138 respondents (100 men, 38 women), and the research group of abstainers is 94 (58 men, 36 women).

**Results:** Statistically significant gender differences in experienced social and emotional loneliness are found in adolescents and addicted respondents. For both male and female adolescents, excessive internet use is a significant predictor of psychoactive substance use. The prediction is more robust if, in adolescents, at least one parent suffers or has suffered from some kind of addiction.

**Conclusions:** Aspects of virtual space act as significant risk factors which, together with loneliness, create multiple risk conditions for risk behavior in the field of psychoactive substance use.

**UDC Classification:** 304

**Keywords:** Adolescents. Risk behavior. Loneliness. Addictions. Regression analysis. Metatheory.

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## APPLE TREE MODEL OF EMOTION-INVOLVED PROCESSING

Jana Kamenická<sup>1</sup>

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**Abstract:** The aim of this paper is to summarize the findings of research done in the field of foreign language pedagogy, neuroscience, and psychology with regard to the emotion-cognition relationship. Several studies of qualitative and quantitative nature, which were conducted on teenage and university students, suggest that cognition is strongly affected by emotional experience. Especially positive emotionally competent stimuli experienced when learning a foreign language can contribute to deeper processing and better long-term retention, and at the same time, it is suggested that they have the power to alleviate foreign language anxiety and enhance foreign language enjoyment and the motivation of learners. With regard to these research findings and several cognitive theories, the Apple Tree Model of Emotion-Involved Processing in Foreign Language Learning is proposed and discussed – as well as several ideas on how to emotionally stimulate foreign language learners, which are applicable not only in foreign language classes but also out of the class. Their addictive nature ensures that learners can and do learn the foreign language every day at any time of the day in an authentic language environment – even without realizing it – doing it as a hobby.

**UDC Classification:** 81.34

**Keywords:** emotionally competent stimuli, emotion-involved processing, foreign language pedagogy, TEFL.

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## THE INFLUENCE OF PARENTAL AND PEER ATTACHMENT ON SELF-ESTEEM AT LATE ADOLESCENCE

**Migena Kecaj<sup>1</sup>, Edmond Rapti<sup>2</sup>, Aigars Andersons<sup>3</sup>**

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**Abstract:** The present study investigates the relationship between parent and peer attachment bonds on the development of self-esteem during late adolescence. The sample was randomly selected. Data was collected from 387 participants including 166 male and 221 female students from seven high schools of the Shkoder Municipality in Albania. A self-developed Demographic Questionnaire, Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) and Rosenberg Self Esteem Scale (Rosenberg, 1965) were administered. A Pearson Correlation and Independent sample t-test were applied. Specific attention is focused on the assessment of attachment in adolescence. The results show the existence of a significant positive correlation between parental/peer attachment and self-esteem. Concerning gender differences during late adolescence, females showed higher attachment with parents and peers than males, but there were no gender differences in self-esteem. This research enables us to develop new insight into the importance of parent and peer attachment for a healthy adolescence.

**UDC Classification:** 159.942

**Keywords:** attachment; development; parent; peer; self-esteem.

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## THE INTERNET AS A COMMUNICATIVE TECHNOLOGY AND ITS POLITICAL VALUE

Mikhail S. Konstantinov<sup>1</sup>

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**Abstract:** The work presents some results obtained in the process of implementing two sociological studies of the consciousness of students in the South of Russia, conducted by the research team of the Southern Federal University in the period of 2014-2016 and 2018-2019. Methodologically, both studies included a series of free group interviews, questionnaires and focus groups. Analysis of the data obtained shows a significant shift in the sentiments of student youth towards greater opposition to the current government: if in 2015 less than two-thirds of the respondents (60.6%) believed that radical changes in Russia were impossible, then in 2019 more than two-thirds of respondents expected serious shocks (72.4%). Among the key reasons for the growing tension in Russian society, students name socio-economic (42.2%) and internal politics (50.0%). But the greatest resonance in the student mind is caused by the attempts of the Russian authorities to control the Internet. Thus, according to a survey conducted in 2019, 37.4% of respondents consider the Internet the most important source of information, and another third (29.5%) point to the anti-constitutional nature of these laws. Therefore, Internet restrictions may well become an annoying factor: 39.7% of those surveyed declared their readiness to take part in protests, if there are any. The analysis shows that the communicative value of the Internet is at a much deeper level of the cognitive structures of student consciousness than traditional political values. The value of Internet freedom turns out to be one of the most basic values for today's youth, comparable to fundamental values such as social connections, recognition, identity, etc.

**UDC Classification:** 316.6

**Keywords:** political ideology, cognitive-ideological matrices, student consciousness.

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## PUBLIC PERCEPTION OF THE CONSEQUENCES OF POVERTY IN SELECTED LIFE DIMENSIONS

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**Abstract:** Poverty is a phenomenon that receives a lot of attention from a wide range of professionals as well as the lay public. This is a serious problem that significantly changes the lives and functions of individuals, families, as well as communities.

The aim of this study was to find out how society perceives the consequences of poverty in individual dimensions of human life selected by us and also to find differences in perception of the consequences of poverty in terms of the selected demographic data (gender, place where the respondent lives, place of residence – city or countryside, faith, employment status, shared household, benefits in material deprivation, and an opinion on who should primarily address the problem of poverty). A quantitative research strategy was implemented using a self-designed questionnaire. The questionnaire contained 37 items and focused on the perception of poverty and its consequences in our selected areas. The questionnaire contained 6 basic dimensions, resp. areas. These were the health area, the hygiene area, the social area, the psychological area, the structural area and the housing area. We used a deliberate and quota selection (region, gender). The total sample (n) consisted of 384 respondents. The average age of the respondents was  $36.30 \pm 12.91$  years old (min. 18, max. 75).

The results did not show a statistically significant difference in the perception of areas most affected by poverty in terms of gender; in terms of receiving benefits in material need, there was a statistically significant difference in health, mental health, housing and social affairs. In terms of residence (countryside, city), a statistical difference was recorded only in the area of health. There were also significant statistical differences in the area of geography (the region in which the respondent lives), in the area of health and hygiene, and the structural area. The practice of faith has proven to be an important determinant of the perception of poverty, especially in the social and psychological spheres. We also noticed differences in the perception of poverty in some areas in terms of shared household and employment status.

**UDC Classification:** 304

**Keywords:** Poverty. Consequences. Public. Perception.

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## THE PHONICS METHOD IN TEACHING EFL PRONUNCIATION TO YOUNG LEARNERS WITH DYSLEXIA

Zdena Kralova<sup>1</sup>, Daniela Soradova<sup>2</sup>

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**Abstract:** The Phonics method brings more logic into the correspondence between English pronunciation and spelling. Therefore, it might be beneficial for learners with special educational needs (namely dyslexia). The study investigates the effectiveness of the Phonics method in teaching English pronunciation to young non-native learners comparing the achievement of the intact and the integrated learners. The Phonics method was applied for five months in the experimental group, and other, more traditional methods for teaching EFL pronunciation were applied in the control group at an elementary school in Slovakia. Both groups consisted of the intact and the integrated learners (experimental group: 19 intact and 2 integrated learners; control group: 17 intact and 2 integrated learners). The learners underwent a dictation and a reading test in pre-test and post-test, and the results indicate the benefit of the Phonics method for all learners with significant improvement among learners with dyslexia. The integrated learners' improvement rate was nearly six times (dictation)/three times (reading test) higher in the experimental group than in the control group.

**UDC Classification:** 81.34

**Keywords:** English, pronunciation, Phonics, dyslexia, young learners.

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## LEVEL OF UNIVERSITY STUDIES AS A FACTOR RELATED TO ACADEMIC PROCRASTINATION IN TEACHER TRAINEES IN THE SLOVAK REPUBLIC

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**Abstract:** Procrastination represents a significant chronic tendency of individuals to delay tasks manifested in various fields of human activities, including their academic life. Even though the results of available research show that almost every student is a procrastinator, in Slovak research, not much attention has been paid to this phenomenon. In the presented paper, the authors deal with the topical issues of academic procrastination in university students enrolled in bachelors and masters teacher training programmes and present the partial results of an original research study in the discussed field according to the variable of the level of university studies. The sample consisted of 748 respondents from the above specific target group and is evenly distributed. For the purposes of the research, an author-constructed questionnaire was used. The results indicate that teacher trainees in master programmes miss deadlines more frequently and they tend to procrastinate in relation to their academic tasks more than their colleagues in bachelor programmes. The presented research brings unique data from the Slovak academic environment and has implications for further research in the field of academic procrastination.

**UDC Classification:** 378

**Keywords:** procrastination, academic procrastination, teacher trainees.

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## POSSIBILITY OF DETERMINING ARGUMENTATION IN SOCIAL SCIENCE ARTICLES: THE CASE OF LATVIAN

Dzintra Lele-Rozentāle<sup>1</sup>, Diāna Laiveniece<sup>2</sup>, Agnese Dubova<sup>3</sup>, Baiba Egle<sup>4</sup>

**Abstract:** Argumentation is an essential part of the research process and its linguistic representation. Argumentation, as well as the formation of appropriate wording requires that the author is familiar with different types of argumentation and the experience with their use to substantiate one's thoughts and statements in a proper scientific way. Until now, argumentation as an object of linguistic research in scientific has been widely researched, but in the context of scientific articles in Latvian, it has not been studied at all.

This paper explores the possibilities of qualitative analysis of argumentation in order to develop a methodology for determining the presence of argumentation and further linguistic research on it (for example, classification of argumentation by strategy, structure, scope or expansion, etc.).

To achieve the intended goal, 20 social science articles (published from 2016–2018) in Latvian have been selected from the fields of political science, economics and business, education, and sociology. These articles were structurally different, 8 articles strictly adhered to IMRaD format, 6 articles partially followed it (mainly the discussion section was missing) while the remaining 6 articles completely ignored the IMRaD format. The selection of articles was done to accept or reject the initial hypothesis that the proportion of argumentation is directly related to the IMRaD structure of the articles.

To determine the argumentation, the same research methods that are used in computational linguistics are applied to qualitative research and manual text zone marking is used. The study was intended to obtain and test a universal methodological approach that could be used for future linguistic research in disciplines (mainly humanities and arts) where the IMRaD structure is not used.

**UDC Classification:** 81'33

**Keywords:** scientific language, argumentation, text zoning, article, social science

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## **SELF-EFFICACY AMONG STUDENTS IN HIGHER EDUCATIONAL INSTITUTIONS DURING ONLINE LEARNING SELF-EFFICACY AMONG STUDENTS IN HIGHER EDUCATIONAL INSTITUTIONS DURING ONLINE LEARNING**

**Dora Levterova-Gadjalova<sup>1</sup>, Galin Tsokov<sup>2</sup>**

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**Abstract:** Distance learning around the world has set new requirements for educational institutions and particularly for the students. Self-efficacy is one of the essential factors for success. Self-efficacy in an online learning environment is related to the confidence in one's ability to succeed, knowledge and ability to use the technology, and the casualness of success in the new education model, which is evolving rapidly from Education 2.0. to Education 4.0. A survey was conducted among 134 students from higher educational institutions (HEIs). The results of the study demonstrate that self-assessment, emotional responses, motivation for academic success, and self-referential information of students in HEIs regarding the learning content are unstable. A rise in the knowledge and usage of various electronic devices and electronic resources has been reported along with a rise in cognitive load. There is an effect of cognitive distortion on mastering the learning content and setting more challenging goals in terms of the transition from the traditional model of learning to distance learning and on their learning competencies .

**UDC Classification:** 378

**Keywords:** Self-efficacy, online learning, students, HEIs.

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## OPTIMIZING THE BEHAVIOR OF THE EMERGING ADULT BY DECREASING OF MALADAPTIVE MENTAL SCHEMAS

Violeta Lungu<sup>1</sup>, Mihaela Stomff<sup>2</sup>

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**Abstract:** The article presents the research results on the effects of a program for optimizing emerging adults' behavior in Romania. Behavior optimization was achieved by improving maladaptive mental schemas through group cognitive-behavioral interventions. The research was conducted in two stages. The research's initial stage consisted of an investigation of a group of 212 young people (19-30 years old) belonging to the NEET category (Not in Education, Employment, or Training). The psychological tools assessed the personality, the level of manifestation of cognitive and emotional maladaptive schemas, Personal Autonomy, and Self Efficacy. The second stage of the research involved 48 NEET young people who participated in a personal development program to optimize behavior for a period of 18 months. Participants experienced improvements in dysfunctional mental schemas, reported increases in personal autonomy and flexibility, and adaptive changes in personality structure. This research is a first in Romania and joins the efforts to improve the psycho-social condition of young NEETs in Romania (currently at 16.8%).

**UDC Classification:** 159.92

**Keywords:** emerging adults, NEET, cognitive schemas, autonomy, self-efficacy

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## **FAMILY LIFE CRISIS – A COMBINATION OF TRADITIONAL AND POSTMODERN VALUES AND FORMS OF LIFE**

**Hermína Mareková<sup>1</sup>**

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**Abstract:** In the recent times, we are witnessing turbulent changes in society which cannot be avoided, even by families. These changes began to manifest themselves most markedly at the end of World War I and became more pronounced in the second half of the 20th century. A diverse range of cohabitation forms has emerged. Discussions about these forms have multiplied, with new questions arising. There is still a debate among experts about what form of cohabitation is called "family". Is the family still considered the foundation of the state, the basic building block of society? Despite these shifts in cohabitation, we still consider the family the most stable institution in society. The older functions that the family has fulfilled so far are gradually changing as a result of the current societal changes, and divisions exist only in theoretical considerations. When examining crisis in the family, the position of women in the family is also an important aspect, especially when regarding gender equality. Few studies address the issue that "women's thinking" about the family depends on the myriad of external and internal conditions that women encounter in childhood and during their upbringing. We later transfer these "inner truths" into our behavior when we are adults.

We cannot ignore the importance of mass media, such as TV, the Internet, the various world communication networks, which are regarded by contemporary sociology as the third factor of socialization, alongside the family and school. Unfortunately, these may be regarded as rather as a factor of negative socialization.

**UDC Classification:** 304

**Keywords:** family, values, crisis, functions

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## CULTURAL-SOCIOLOGICAL CHANGE OF PARADIGMS IN SOCIAL WORK

Hermína Mareková<sup>1</sup>

**Abstract:** There is a lot of discussion about social work, its forms, and whether social work is needed. If so, then in its existing or a different form? Often, only subjective thoughts or practical experiences are presented. They are subjective because, by pointing out the unfavorable situation, they describe a certain unidentifiable barrier, a shortcoming in building this profession, which social work has not been able to overcome in the past long period. As if we were wasting our chances of change. The performance of social work still has a socialist flavor, and therefore the Western models adopted in our country since the end of 1980's have not met with legislative support. This situation was partly caused by the fact that we took over "a little of each corner", without complexity, as if the richer competencies remained somewhere at the border crossing between Kittsee and Bratislava. It is not possible to compare the beginnings of social care in our country, which began elsewhere in the world in the '30-'40s, because, for ideological reasons, there was a certain effort to discredit some issues, together with other deviant problems. These ideological motivations have already disappeared but were replaced by economic reasons, which continued to prevent social care from undergoing a change of opinion and structure. Evidence of these shortcomings is also the fact that no government has so far embarked on the creation of family social policy, as if this situation suited all actors. Within the EU, considerable financial support comes to the social area, but it disappears in the wallets of non-profit organizations, often without control, and that is why there is no such systematic change. Even very beneficial projects in various "non-profit" organizations work only until the allocated funds are spent, and after the expiration of the time required for the existence of the project by the EU, the project falls into oblivion, and those organizations often apply for a completely different project. Research data is missing for a systemic change. Without the available research data, we cannot even expect a change in paradigms, so we continue to lag behind the more developed part of the world in this area.

**UDC Classification:** 304

**Keywords:** social work, legislation, change

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## **EVALUATION OF THE STATEMENT OF TATIANA MASLOVSKAYA ABOUT THE NEW TRENDS IN ELECTORAL LAW IN THE CIS COUNTRIES IN THE PERIOD FROM 2017 TILL 2019**

**Ekaterina Marmilova<sup>1</sup>**

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**Abstract:** During the period from 2017 till 2019, there is a tendency of acceptance of new norms in Electoral Codes and Constitutional laws in the CIS countries. The author analyzed the hypothesis by Tatiana Maslovskaya about the evolution of electoral legislation in the CIS countries and new trends as codification, globalization, democratization in electoral law, by making the analysis of the amendments to the Electoral Codes and Constitutional Laws of the CIS countries in the period from 2017 to 2019. The globalization trend of electoral legislation in the CIS countries was not clearly expressed in those amendments, additions that were adopted in the research period.

**Conclusions:** There is a tendency for individual CIS countries to codify their electoral legislation in codification format since they haven't done it before. The democratization trend is clearly expressed in the amendments.

**UDC Classification:** 324

**Keywords:** Electoral Code, The CIS countries, state member of the CIS countries, electoral standards electoral law

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## DISTANCE FORMS OF CRISIS INTERVENTION DURING THE COVID-19 PANDEMIC

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**Abstract:** In the current pandemic period caused by COVID-19, the availability of distance forms of social services is exceedingly important. Crisis intervention performed in a distance format helps a person experiencing an acute crisis via telephone and online form of assistance. The paper's primary aim was to find out the use of distance crisis intervention services during the COVID-19 pandemic in Slovakia, to clarify what needs are prioritized for respondents at this time, the type of social problems they turn to crisis intervention and the usability of crisis lines during the pandemic. The quantitative survey was carried out in the form of an anonymous questionnaire, which was available only in electronic form via Google forms, and the respondents were addressed on social networks. The questionnaire was filled in by 291 respondents. Based on the processed data, the distance form of assistance is a little-sought option in solving social problems related to the COVID-19 pandemic. Our recommendation is to support and promote the distance form of assistance more through advertising or financial support – especially considering that many crises could not be dealt with on the part of respondents or the helplines themselves.

**UDC Classification:** 304

**Keywords:** crisis intervention, distance form of crisis intervention, social problems, crisis.

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## **ANALYSIS OF THE CONNECTIONS BETWEEN LIFELONG LEARNING AND SOCIAL COMPETENCES OF HUMAN RESOURCES**

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**Abstract:** The primary aim of the research was to find out the existence of statistically significant connections between the assessment of the effectiveness of lifelong learning and the identification of social competence by human resources who completed social competence development training and those who did not. The starting point for data collection was the VVOS questionnaire concerning the effectiveness of lifelong learning, and the AKMK questionnaire focused on identifying social competence. The research was conducted on a sample of 211 human resources, of which 118 (55.9%) were women and 93 (44.1%) men aged from 23 to 66 years. Using correlation analysis, we identified statistically significant connections between the factors for assessing the effectiveness of lifelong learning and the factors for identifying the social competence of human resources, who have completed training to develop social competence.

**UDC Classification:** 005.95/0.96

**Keywords:** lifelong learning, social competence, human resources development

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## INNOVATIVE STRATEGIES FOR EDUCATION OF ROMA CHILDREN IN PRIMARY SCHOOL

Rumyana Neminska<sup>1</sup>, Tanya Borisova<sup>2</sup>

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**Abstract:** The problem with the education, socialization and upbringing of Roma children in Bulgaria is serious and requires the joint efforts of universities and schools. For many of these children, education is not a value. They study only in primary school and then remain traditionally in their family. It must be recognized that traditional family values and traditions for the Roma have the force of law. Many Roma families managed to socialize by leaving the ghetto and settling in Bulgarian communities - but many of them do not want to change their lifestyle. The cooperation between the schools and the university is presented in the university project "Innovations in the socialization of bilingual students through communication and speech development" presented here. A methodological innovation for the education of Roma children has been introduced. This innovation combines tradition (Roma fairy tale) and the development of reader literacy, thinking, and solving cases. A total of 415 Roma students participated in the empirical study. With their participation in the project it is established that they increase their reading skills, learn the Bulgarian language better and develop critical thinking.

**UDC Classification:** 37.01

**Keywords:** school, education, Roma, methodology

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## THE EFFICIENCY OF THE APPLICATION OF SPSS IN HIGHER EDUCATION TEACHING: AN EXPERIMENTAL STUDY

Jelena S. Osmanović Zajić<sup>1</sup>, Jelena Ž. Maksimović<sup>2</sup>

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**Abstract:** Acquiring statistical education is a prerequisite for the professional and scientific work of every pedagogue. Institutional support for the statistical education of students is a fundamental starting point in the development of research competencies necessary for a future pedagogue. The subject of this study was focused on examining the effectiveness of the application of a program for statistical data processing in teaching. The research aimed to examine whether students gained adequate knowledge in the field of Statistics in Pedagogical Research by applying the experimental factor SPSS in teaching. This means that the use of the SPSS program may significantly facilitate the acquisition of theoretical and practical knowledge pertaining to the field of statistics in pedagogical researches. The objective was to analyze whether using the SPSS software as part of university education would yield better knowledge of statistics than teaching without it. This objective was accomplished by analyzing the differences in the respondents' scores on the knowledge test using the pre-test and the post-test groups of students. Three generations of pedagogy students at the Faculty of Philosophy, the University of Nis in Serbia, participated in the experimental research. The results showed statistically significant differences in the participants' achievement in the initial and final tests.

**UDC Classification** 378

**Keywords:** SPSS program, Statistics in Pedagogical Research, Statistical education, Students, Higher education

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## IN-SERVICE TEACHERS' VIEWS ON DEVELOPING COMMUNICATIVE COMPETENCE AT PRIMARY LEVEL IN THE PROCESS OF TEFL IN SLOVAKIA

Klaudia Paulikova<sup>1</sup>

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**Abstract:** Reaching communicative competence in a foreign language is one of the key objectives of the foreign language education policy of multiple European countries, including Slovakia. The unified concept of communicative competence provides learners with equal opportunities for mastering languages at their best and enables its development from the very beginning of learners' studies. In low proficiency levels (A1) in primary education teachers play a crucial role in developing communicative competence of their learners. Research in the field reveals that although teachers are aware of their great influence and importance in the development of communicative competence, they often do not provide sufficient circumstances for learners to reaching it. A qualitative inquiry conducted with a number of in-practice English teachers working in Slovak primary schools presents the importance of having balanced development in all the components of communicative competence in TEFL, its implementation into the lessons of English, as well as an overall view of teachers' standpoints towards its development at the primary level. The results show the tendencies of teachers to concentrate more on certain (especially linguistic) elements of communicative competence, whereas other competences (mainly of pragmatic character) are often neglected.

**UDC Classification:** 81'27

**Keywords:** communicative competence, English, primary level, interview

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## **SOME ASPECTS OF THE DEVELOPMENT OF CONTEMPORARY LATVIAN TERMINOGRAPHY: CHALLENGES, SOLUTIONS, OPPORTUNITIES**

**Elīna Peina<sup>1</sup>, Anita Helviga<sup>2</sup>**

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**Abstract:** While studying the state of contemporary Latvian terminography, it must be acknowledged that terminological dictionaries are issued very often. The present research examines 450 Latvian terminological dictionaries that have been published in the last 30 years. Terminological dictionaries represent 30–40 % of the entire Latvian lexicography. Their characterization has a wide variety, both in terms of the authors and publishers, in terms of language selection and in terms of target audience. In addition, there are dictionaries approved by the Terminology Commission and dictionaries that are not approved by any official institutions. There is a lack of studies on the habits and needs of term dictionary users. In addition, publications of criticism or analysis about the qualitative performance of such dictionaries are also rare and no criteria has been developed to fully analyse and evaluate the development of terminology's theory and practice. In this article, the authors have focused on exploring the situation in order to clarify the main trends in the characteristics of the terminography of Latvia. This was done through interviews with representatives of leading publishers who confirmed that the publishing houses are losing interest in issuing terminological dictionaries and discussion with the Chairman of the Terminology Commission of the Latvian Academy of Sciences. The authors have identified the main issues in organising the terminology process and determined answers to specific questions: what determines the dictionaries' choice and credibility factor; how is feedback sought after a new dictionary is issued; what alternatives exist in areas where terminological dictionaries have been missing for decades, etc. Finally, the study analyses the new Latvian National Terminology Portal, which has been in operation for two years, with an aim to provide information on terms and to allow everyone to participate in the process of creating new terms.

**UDC Classification:** 811.174

**Keywords:** lexicography, terminological dictionaries, Latvian terminography

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## THE SYSTEM AND STRUCTURE OF THE SOCIAL ECONOMY IN THE SLOVAK REPUBLIC

Peter Plavčan<sup>1</sup>, Petronela Šebestová<sup>2</sup>

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**Abstract:** The 20-ties of the 21<sup>st</sup> century are dented by the COVID-19 period. The fall of the world economy, the frustrations of the inhabitants because of their health, and unclear state policies throughout continents require functional measures. The application of the principles of social economy enables creation of the working system of sustainable entrepreneurial activities with the help of state means, transforming small and middle-sized enterprises into a social economy. The knowledge on the system and organization structure of the social economy in the Slovak Republic enables dissemination and potential application in the international context in the current pandemic period characterized by COVID-19. The system of social economy is being defined by Slovak legal regulations and selected statistic indicators about the social economy subjects in the Slovak Republic. A part of it is also a structural classification of the organizational structure of the state administration of the social economy, classification of the kinds of social enterprises, as well as classification of the wider area of the social economy from the multiple points of view in the Slovak Republic. The research results can be used as an argument for implementing of social economy in national economies.

**UDC Classification:** 364-7

**Keywords:** social economy, social enterprise, enterprise with a social impact, wider area of the social economy

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## SOCIETY AND RESOURCES OF INTELLECTUAL CAPITAL IN SOCIAL RELATIONS

Peter Plavčan<sup>1</sup>

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**Abstract:** The scientific-technical development of the world society is based on quickly developing information and communication equipment and technologies. The knowledge about the education society and its characteristics in the international context and the knowledge on the intellectual capital enable international comparison of the selected states of the world. The knowledge on the relation between intellectual capital and the costs to reproduce it also enables comparison between the individual states mutually and makes it possible to ponder the relation between the quality of education and the basic economic indicators, e.g., gross domestic product. The overview of selected statistic indicators describing the size of the intellectual capital and systemization of knowledge on intellectual capital from the point of view of the society as well as individual and the proposition of the opportunities to measure intellectual capital enable a more detailed focus on the intellectual capital topic and its importance for the world society and economy. The research results can be used as an argument for increasing expenditure on education in national economies.

**JEL Classification Numbers:** A13, H10

**Keywords:** intellectual capital, social system, social relations, tertiary education

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## INFLUENCE OF INTEREST GROUPS IN LATVIA ON CENTRALIZATION

Māris Pūķis<sup>1</sup>, Lilita Seimuškāne<sup>2</sup>

**Abstract:** Latvia has experienced four administrative-territorial reforms in 30 years. In 1989, local and regional elections were the first democratic elections in Latvia since 1934. From 1990 to 1992, self-governments were the main authority for re-establishing national independence and transforming the country from totalitarianism to democracy. The transformation process starts with wide decentralization, including substantial fiscal decentralization and substantial administrative decentralization.

The first reform was the centralization (1994) of Rīga city government (1 self-government instead of a two-tier system, with 6 district local governments and 1 city local government). The second reform abolished elections in 26 regional councils (1998) and replaced them by delegates from local governments. The third reform (2009) was abolishing regional governments and reducing the number of local governments 5 times. The fourth reform will be implemented after June 5 2021, and its content is reduction of the number of municipalities 3 times. Therefore, from 596 local and regional governments in 1990s, Latvia will only have 42 local governments.

All those reforms were directed towards centralization. Official goals of public administration reforms can differ from real intents of pressure groups, who impact ruling political parties and central government decisions. The paper aims to analyze reforms depending on pressure groups, who believe in benefits from centralization. Methods of policy analysis and grouping of statistics about administrative territories are used.

They provided research shows that real goals of all four reforms were an expression of political competition. Dominating interest groups in each case have conflicting interests. Previous reforms facilitated emigration and peripheries effect, while the positive impact on regional development is not achieved. The impact of the last reform will largely depend on the results of the next parliamentary election of 2022.

**UDC Classification Number:** 351; 352; 353; 354; DOI:

**Keywords:** local government, Administrative territorial reform, interest groups, centralization, Latvia

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## RUSSIAN YOUTH ABOUT RUSSIA, UKRAINE, AND BELARUS — IMAGES OF COUNTRIES AND PEOPLES

Irina Snezhkova<sup>1</sup>

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**Abstract:** The main goal of the present examination was to study the ideas of the Russian youth about Russia, Ukraine, and Belarus under existing social and political conditions. To this end, in 2018-2020, in a number of Moscow universities, sociological research was carried out, studying the images of Russia, Ukraine, and Belarus as perceived by Russian students. As far back as 30 years ago, the Russians, Belarusians, and Ukrainians had been perceived as three tight-knit ethnic groups within a broader category of East Slavs, but with the collapse of the Soviet Union, three independent states were formed, whose fates began to develop in different ways. At the present time complicated by all sorts of political controversies between the three countries under consideration, it seems important to know how these countries, their leaders, and peoples appear to the young people of Russia, what their attitude is to certain significant recent political events, namely the events in Ukraine, and to the opposition movement in their own country. The main research method was a sociological survey plus a certain amount of psychological testing. In total, 600 people were interviewed in several major universities in Moscow. The materials were then processed using the SPSS computer program. Also, the students were asked to present their perceptions of the country, its people, and its leadership in drawings, making the images as emblematic as possible. The results of the study showed that despite the difficult socio-political situation, Russian youth demonstrate a rather positive attitude towards their own country and its leadership; they regret the conflict in Ukraine, sympathize with its people, and condemn the ongoing civil war in the east of the country. Russians perceive Belarus as a friendly country with which it is necessary to strengthen cooperation. The research materials may be useful to specialists dealing with the ethnic issues in the three countries and with their political, economic, and cultural construction.

**UDC Classification:** 378

**Keywords:** Russian youth, images of Russia, Ukraine, and Belarus. Young people's perception of people and power, psychological testing, and sociological approach to the study of ethnic issues in a socio-political context.

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## INTRODUCTION OF ELEMENTS FROM PROBABILITY THEORY IN THE EDUCATION IN MATHEMATICS FOR PRIMARY SCHOOL

Maria Temnikova<sup>1</sup>

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**Abstract:** The article considers the prerequisites for the inclusion of problems with elements of probability theory in mathematics education in grades 1-4. This type of task is generally not present in the compulsory curriculum in mathematics in primary school, but they could be used in classes for compulsory, extended, and additional training, thus creating conditions for implementing developmental learning.

Some theoretical statements about the theory of probabilities are systematized, related to the tasks included in the constructed and approved methodological system of work. Some of its characteristics are presented. This article offers some of the tasks for grades 1-4.

A longitudinal empirical study was conducted with students of the 1-4th grade in the period 2015 to 2020. The results of the outgoing diagnostics in 4th grade are processed by mathematical and statistical methods and are presented graphically. They show that fourth-graders successfully solve problems with elements of probability theory, and a primary school teacher could use them in the systematic work in mathematics at the initial stage of the basic educational degree.

Solving non-standard mathematical problems is an element of probability theory that helps arouse interest, motivate students, and place them in an active cognitive position by solving problem situations in the pedagogical interaction in mathematics in primary school.

**UDC Classification:** 37.01

**Keywords:** problems with elements of probability theory, training in mathematics

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## **SPECIFICS OF TEACHING THE INVERSE RELATIONS BETWEEN THE ARITHMETIC OPERATIONS ADDITION AND SUBTRACTION DURING THE EDUCATION IN MATHEMATICS IN GRADE 1**

**Maria Temnikova<sup>1</sup>**

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**Abstract:** One of the fundamental knowledge in mathematics in Primary school is related to the arithmetic operations addition and subtraction. According to the educational programs in mathematics in the Republic of Bulgaria, students start studying these operations in grade 1.

The article presents theoretical concepts affecting studying the arithmetic operations addition and subtraction in the education in mathematics at a primary school.

The research work identified the specifics of studying the inverse connections between the arithmetic operations addition and subtraction in the education in mathematics for grade 1 are also presented. Some of the significant tasks with importance for discovering the relations between the forward operation addition and the reverse operation subtraction were proposed in the study. A new methodology system of work with tasks where these relations are used was developed and tested.

The author studied the knowledge, skills, and competencies of the grade 1 students to solve arithmetic operations addition and subtraction tasks. After the exit diagnostic, it was found out that the students of the class where the new methodology system of work was applied during their education in mathematics have got a higher level of knowledge and skills from competency Cluster Numbers in respect of the arithmetic operations addition and subtraction.

The use of mathematical tasks with reverse relations between the arithmetic operations addition and subtraction help the students to develop both the overall mathematical knowledge and the logical thinking of the first-graders.

**UDC Classification:** 37.01

**Keywords:** inverse connections, arithmetic operations addition and subtraction

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## CREATIVE ACTIVITIES FOR ACQUIRING GEOMETRY KNOWLEDGE DURING THE PROCESS OF EDUCATION IN GRADE 3

Maria Temnikova<sup>1</sup>

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**Abstract:** The article systematized some theoretical concepts related to creativity as process and activity.

The researcher analyzed the expected results from the education in mathematics in grade 3 and particularly from competency Cluster “Geometry figures and bodies” included in the educational program approved by the Ministry of Education of the Republic of Bulgaria. A new methodology system of work was developed and tested. The system includes tasks of a type that will facilitate the students to perform creative activities. Some of these tasks are presented in the research work.

Results of the empiric study have been processed using mathematics-statistics methods and are graphically presented. The results demonstrated that the students successfully performed creative activities during the process of acquiring geometry knowledge.

The problem-productive strategy of education applied during education in mathematics for grade 3 students provoked them to perform creativity activity and created preconditions for development in the students of knowledge, skills, competences, and competencies related to geometry figures.

**UDC Classification:** 37.01

**Keywords:** creative activities, training in mathematics, competencies, and competencies

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## FACTORS INFLUENCING THE CHOICE OF THE SOCIAL PROFESSION 'TEACHER'

Mariya Teneva<sup>1</sup>, Zlatka Zhelyazkova<sup>2</sup>

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**Abstract:** This article is aimed at revealing the specifics of the professional choice made by students-future teachers. The increased interest in recent years of young people in studying pedagogical specialties provoked our research attention towards differentiating the factors influencing their professional choices. This article presents the results of a study conducted with students majoring in "Primary school pedagogy with a foreign language" who study at the Faculty of Education at Trakia University, Stara Zagora, Bulgaria. The results of the study indicate that in their professional choices, students are influenced by a wide range of social and personal factors. The most important social factors are: proximity of the university to the place where the student resides, the high social assessment of the quality of education at the university/faculty, and the prestige of the teaching profession in society. Among the personal factors for choosing the profession of pedagogue, students rank in leading positions their desire to work with children and their love for the teaching profession, formed under the influence of the high professionalism of their good teachers.

**UDC Classification:** 37

**Keywords:** education, teaching profession, factors for professional choice.

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## **TEACHING REASONING: A COGNITIVE-CULTURAL APPROACH**

**Lev Vasilev<sup>1</sup>, Valentina Zaitseva<sup>2</sup>, Elena Belova<sup>3</sup>, Natalia Cherkasskaya<sup>4</sup>,  
Olga Sukhareva<sup>5</sup>**

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**Abstract:** This paper describes personal reasoning peculiarities of Russian undergraduate students viewed through the prism of their culture and their psycho-typical characteristics. The experimental study showed specificity of argument formation in the students' reasoning about their cultural values. Our experiment identified the respondents' poles within the cognitive style 'abstract / concrete conceptualization' based on their verbalization of the primary values. Four levels of concept abstraction were detected and proved by the students' verbal manifestations: the resulting students' texts showed remarkable differences between the poles concerning preferences of argument exposition, both in its construction schemes and in the choice of components of the arguments. We thus state that the degree of variability of the students' value assessment correlates with the degree of formation of the mechanism of differentiation in value orientations. Our recommendations for teaching reasoning concern: linguistically based principles of student cognitive differentiation which minimize distractive factors; choice of teaching tasks depending on the student specific conceptualization pole; and ways of activating differentiation and integration operations in reasoning. In a broader context of education, students' individual peculiarities and cognitive preferences should be focused on training which stimulate the students' learning interest.

**UDC Classification:** 37.06+81'33+130.2, 159.92

**Keywords:** conceptualization, cognitive, reasoning, teaching, values

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## **ATTITUDES TO THE APPLICATION IN PRACTICE OF THE SPORTS- ENTERTAINMENT COMPETENCE OF THE EDUCATOR**

**Donka Zheleva-Terzieva<sup>1</sup>**

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**Abstract:**

**Introduction:** This article examines and analyses the need for the formation of professional-pedagogical competence for the realization of sports-animation activities in an educational environment. The opinion of current pedagogues and competent persons (experts in the field of physical education, sports animation and pedagogical area) have been studied, as well as the change in the attitudes of students from pedagogical specialties, as a result of training, on the application of the sports-animation competence of the pedagogy in and out of professional pedagogical practice.

**Methods:** The empirical method used is a survey applied to 291 persons. The results obtained are subject to processing and statistical analysis by the methods of quantitative analysis of survey data – Van der Waerden test and Z-test. The concordance coefficient has been calculated – to determine the degree of consistency in the expert assessment and the main empirical characteristic, – as a well as the arithmetic mean.

**Findings and results:** The results show high values of the indicators characterizing the opinions and attitudes of the surveyed persons both in the direct professional-pedagogical activity and on its realization beyond the vocational-pedagogical practice (within leisure time) and confirm the existence of grounds and real needs from the formation of professional-pedagogical competence for the implementation of sports-animation activities in an educational environment.

**UDC Classification:** 378

**Keywords:** attitudes, application, pedagogical competence, sports animation.

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## **IMPACT OF DISTANCE LEARNING ON THE MOTOR ABILITIES OF PRIMARY SCHOOL-AGED PUPILS**

**Donka Zheleva-Terzieva<sup>1</sup>**

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**Abstract:**

The article compares the results of motor strength tests of primary school students to establish the impact of distance learning imposed by the authorities in the Republic of Bulgaria at the end of 2020 in order to limit the spread of COVID-19. The purpose of the present study is to determine whether educational tools affect the motor abilities of students. To achieve this goal, motor tests are conducted at the beginning of the school year and after the end of the online training.

**Methods:** The empirical methods used are tests to assess physical performance by jumping from a place with two legs to measure the explosive power of the lower limbs and throwing a solid ball to measure the explosive power of the upper limbs, shoulder girdle, and abdominal muscles. The statistical methods are the relative values of the structure – an absolute sum of the structural differences and integral coefficient of structural differences, as well as correlation and comparative analyzes.

**Findings and results:** The results of the experiment show that the strength achievements of students are not affected by the type of training.

**UDC Classification:** 378

**Keywords:** motor skills, primary school age, distance learning.

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### **3 – MEDICINE AND PHARMACY**

## DIFFICULTIES ENCOUNTERED BY NURSE STUDENTS WHEN WORKING WITH ELDERLY PEOPLE

Albena Andonova<sup>1</sup>, Mima Nikolova<sup>2</sup>, Silviya Kyuchukova<sup>3</sup>, Koni Ivanova<sup>4</sup>

**Abstract:** During the training process, nurse students acquire knowledge, skills and competencies to work with different groups of patients. Working with elderly people has its difficulties and specificities. The acquisition of practical skills by students for planning and documenting individual health care for the elderly people is a process in which teachers and mentors have a leading role.

**Objectives:** To identify the factors which make it difficult for nurse students to work with elderly people.

**Methods:** The study involved 52 3rd year nurse students – from the Faculty of Medicine of Trakia University in Bulgaria.

A questionnaire was used, including open-ended and closed-ended questions, allowing more than one answer. The data was processed mathematically and graphically.

**Results:** The main difficulties for students in working with the elderly people are as follows: the process of communication (92.16%), difficult perception of new information (80.64%) and memory impairment in the elderly patient (61.44%); The main difficulties related to the organization of activity - insufficient experience in working with geriatric patients (92.16%); insufficient time for communication with patients (94.08%); lack of comfort in the patient's home (57.60%); a "Diary for tracking and self-monitoring of the condition" of an elderly person - it is very useful for 90.24% of students so that they can monitor the condition of the elderly person; It was found that 65.28% of students do not want to work with elderly people, as 46.09% of them indicate the motive for this as mental strain.

**Conclusion:** The teacher and the mentor are leading figures in preparing students to work with elderly people. The practical preparation for planning and documenting individual health care for elderly people is very important in the training process of nurse students.

**UDC Classification:** 614.2

**Keywords:** nurse students, difficulties, practical training, elderly people, teacher, mentor.

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## **TELEMEDICINE - A PREDICTOR FOR OVERCOMING THE BARRIER IN THE PROCESS OF TREATMENT OF ELDERLY PEOPLE**

**Albena Andonova<sup>1</sup>, Deyana Todorova<sup>2</sup>**

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**Abstract:**

Telemedicine allows healthcare professionals to assess, diagnose and treat patients remotely using information and telecommunications technologies. Telemedicine is an evolutionary discovery that is increasingly becoming an important part of medical science and practice.

**Objectives:** To study and analyze the opinion of physician assistants for telemedicine as a predictor for overcoming the barrier in the process of treatment of elderly people living in small and remote settlements.

**Methods:** We conducted a survey of the opinion of 80 physician assistants on telemedicine as a predictor for overcoming barriers in the treatment of elderly and senile people living in small and remote settlements.

**Results:** According to the analysis of the data on the benefits of the introduction of telemedicine and because it is a predictor for overcoming the barrier in the treatment of the elderly and elderly, the following was found:

Medical professionals providing medical care to geriatric patients face a number of challenges that require a timely and adequate response, and telemedicine is a predictor of overcoming the barrier in the process of their treatment. In hard-to-reach and remote settlements, there is often a lack of general practitioners, enough outpatient clinics and places to perform activities for the treatment of geriatric patients. In these cases, the application of telemedicine would be adequate. This will increase the possibility of access to adequate medical care. Patients will receive precise and clear instructions. This will reduce the need for transportation or time for patients to access hospitals.

**Conclusion:** The study allows us to draw the following inferences: Telemedicine is an opportunity to improve and enhance the professional activity of physician assistants working with geriatric patients and the implementation of telemedicine will increase the quality of medical care and health care for the elderly population in remote areas and small settlements.

**UDC Classification:** 614.2

**Keywords:** telemedicine, geriatric patients, physician assistant, quality medical care, small and remote settlements

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## **THERAPEUTIC MANAGEMENT OF PATIENTS INFECTED WITH SARS-CoV-2 VIRUS - A REVIEW**

**Nicoleta Blebea<sup>1</sup>, Gabriela Mitea<sup>2</sup>**

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### **Abstract**

**INTRODUCTION:** Due to the rapid outbreak of the pandemic that causes SARS-CoV-2 infection and the increased rate of morbidity and mortality as a result of this new infection, the treatments pursued in therapy must have an increased potential to inhibit the replication of this virus.

**OBJECTIVES:** The main objective of this article was to describe the most current drug therapies and their mechanisms of action used in the treatment of COVID-19. In this article, we have collected the latest information and multilingual international scientific discoveries about the treatment of COVID-19.

**RESULTS:** Several compounds can be used to treat COVID-19 in order to reduce the duration of the disease and the rate of infection, to reduce the viral load, to prevent tissue damage, to stimulate the maturation of many cells, including immune cells in the human body and to reduce its severe symptoms. The most effective treatments were based on the antiviral drugs, antimalarial drugs, anti-inflammatory drugs, analgesics drugs, glycopeptide antibiotics, anticoagulants, vitamin C and vitamin D. The simplest and most direct approach to controlling SARS-CoV-2 outbreaks is the use of passive antibodies transferred from plasma to convalescent patients. Recently, studies have been completed for several vaccines that are approved against SARS-CoV-2.

**CONCLUSION:** Scientists around the world are collaborating and innovating to make tests, treatments and vaccines available to the public that will save lives collectively and end this pandemic.

**UDC Classification:** 616.9,

**Keywords:** COVID-19, SARS-CoV-2, pandemic, treatment, vaccine.

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## **WILLINGNESS OF PROFESSIONALS WORKING IN SPECIALIZED HOSPITALS AND SOCIAL SERVICES TO WORK WITH PATIENTS AND CONSUMERS SUFFERING FROM MENTAL ILLNESSES**

**Daniela Konstantinova Draganova<sup>1</sup>, Nikolina Stancheva Angelova-Barbolova<sup>2</sup>**

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**Abstract:** At the current level of development in psychiatry, in the conditions of deinstitutionalization of mental health services and increased opportunities for control of the symptoms of mental disorders, the problem related to the socialization of patients is becoming more and more relevant. More than 50% of patients with schizophrenia are in a socially active age, which gives rise to the social significance of their rehabilitation.

International practice shows that all specialists dealing with the rehabilitation of patients with mental disorders need to undergo training, which includes the adoption of special methods and techniques. Their work is complex, long and creative.

In Bulgaria there are many national strategies that present different programs for long-term care or only analyze the current situation and care needs. There is no clear vision of how exactly in the future and with what means and specialists this process will take place. The development of psychiatric care lags far behind the needs of the population. There is a serious risk that the lack of trained specialists can ruin the good intentions for deinstitutionalization.

The goal of the present study is to examine the readiness of specialists working in specialized medical institutions and social services to work with patients and users suffering from mental illness.

A survey method was used among specialists from medical institutions and social services for patients with mental and behavioral disorders.

Most of the specialists in psychiatric hospitals in Bulgaria feel prepared to work with the mentally ill - 88.9%;

Almost everyone believes that they need additional training.

**UDC Classification:** 614.39

**Keywords:** Specialists; Mentally ill; medical institutions, social services

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## TO DEVELOP FORENSIC CRITERIA FOR THE DIFFERENTIAL DIAGNOSIS OF INTRACEREBRAL HEMORRHAGE OF TRAUMATIC AND NON-TRAUMATIC ORIGIN USING MUELLER-MATRIX MICROSCOPY OF LINEAR DICHROISM

Marta Garazdiuk<sup>1</sup>, Viktor Bachynskyi<sup>2</sup>, Olena Nechytailo<sup>3</sup>, Oleksandr Garazdiuk<sup>4</sup>

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**Abstract:** Differential diagnosis of intracerebral hemorrhage due to traumatic and non-traumatic origin is a challenging issue, especially in the absence of visible body injuries and other signs of violence. For a forensic expert-practitioner, the main thing is objectivity, accuracy, and speed of obtaining the result, which could fully satisfy the methods of laser polarimetry in the case of differential diagnosis of hemorrhages of traumatic and non-traumatic origin in the human brain matter.

**The purpose:** To develop forensic criteria for the differential diagnosis of intracerebral hemorrhage of traumatic and non-traumatic origin using Mueller-matrix microscopy of linear dichroism.

**Materials and methods:** The object of the study was brain matter samples, collected in 115 corpses of both sexes aged 22 to 86 years with accurately known causes of death. The causes of death included coronary artery disease, traumatic brain hemorrhage, ischemic brain infarction, and non-traumatic brain hemorrhages. Brain matter samples have been frozen rapidly, and histological sections have been made using a freezing microtome. The slices have been evaluated using the method of azimuthal-invariant Mueller-matrix microscopy, followed by mathematical and statistical processing of the results.

**Results:** significant topographic heterogeneity of Mueller-matrix invariants of brain matter samples linear dichroism maps among all research groups have been found. Individual and significant variations of dispersion, asymmetry, and kurtosis magnitude have confirmed the heterogeneity of Mueller-matrix invariants. The difference of images and histograms among groups is explained by the presence of necrotic changes in the case of ischemic brain necrosis and blood cells in the brain matter samples. For the set of central statistical moments of the 1st, 3rd, and 4th orders, which characterize the distributions of circular dichroism, the method of MM-microscopy in the differentiation of samples of non-hemorrhage and hemorrhage groups reaches a satisfactory level - 78% - 84%.

**Conclusions:** Brain matter samples Muller-matrix microscopy of linear dichroism is effective for solving diagnostic problems of forensic medicine related to evaluating the cause of death from intracerebral hemorrhage of various origins. Diagnostic efficiency of Mueller-matrix mapping of polarization manifestations of linear dichroism method for intergroup differentiation of samples of deaths from traumatic hemorrhage (Group 2) and ischemic cerebral infarction (Group 3) reaches a satisfactory level of 79 - 84%.

**UDC Classification:** 616.1

**Keywords:** traumatic intracranial hemorrhage, non-traumatic intracranial hemorrhage, cause of death, azimuthal-invariant Mueller-matrix microscopy

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## ORGANIZATION AND HOLDING OF HOSPITAL THERAPEUTIC NUTRITION IN HOSPITALS FOR ACTIVE TREATMENT IN RUSE'S TERRITORY

Despina Georgieva<sup>1</sup>, Greta Koleva<sup>2</sup>, Irinka Hristova<sup>3</sup>

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### Abstract:

**Introduction:** Daily food consumption is a basic factor for improving both the quality of life and the well-being of people. Hospital medical nutrition needs to suit certain standards and requirements, so as to provide all the necessary micro- and macronutrients for patients. It has to be high-quality food and also has to mind the technological requirements for its preparation in the hospital, in addition to looking aesthetically pleasing and tasting good.

**Objective:** This report's goal is to study the hospital dietary nutrition in the hospitals for active care in Ruse, Bulgaria – University hospital Kanev; University hospital Medika; Mental health center Ruse; Complex-oncological center Ruse and the Specialized Hospital for active treatment of pneumo-phthisiatric diseases - Dr Dimitar Gramatikov.

**Methods:** The survey was conducted between the months of April and September 2020. The criteria for inclusion of those hospitals are: to perform an organized hospital nutrition, and the medical institution to be a hospital itself.

**Results:** In the medical establishments that are included in the study, medical dietary nutrition is carried out in accordance with the normative documents and standards which are in force for the country. The numerological system of nutrition Pevzner is applied, as the basic diets are from №1 to 15, as well as their varieties according to the disease's acuteness.

**Conclusions:** We find that, just because contemporary requirements for nutrition in the Republic of Bulgaria have been presented in developed national recommendations for healthy eating, this is not enough. What is needed is to develop and apply a fully adequate hospital diet, based on an individual assessment of nutrition status, and degree of risk from malnutrition.

**UDC Classification:** 613.2

**Keywords:** Hospital Nutrition; Diets by Pevzner; Nutritional Screening; Medical Nutrition; Malnutrition;

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## PARANEOPLASTIC ECZEMA AS AN INITIAL MANIFESTATION OF A RENAL CELL CARCINOMA

Vanya B. Georgieva<sup>1</sup>, Tsvetelina V. Markova<sup>2</sup>

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**Abstract:** Paraneoplastic skin manifestations are well-known accompanying disorders in cases with a malignant tumor. If not treated, some may lead to serious disability. In fact, these conditions disappear after the tumor removal. Plantar hyperkeratosis as the first manifestation of clearcell renal cell carcinoma has not been reported. We present a patient with severe untreatable hyperkeratosis of the soles of the feet. The paraneoplastic etiology of the eczema was suggested, and a left kidney tumor was diagnosed and operated. Rapid improvement of the keratoderma eczema was observed within a week of the tumor removal. The patient has no local and distant metastases.

Paraneoplastic skin manifestations as initial syndromes of malignant disease can help in the early diagnosis of cancer at a stage that allows complete cure.

**UDC Classification:** 616

**Keywords:** Renal cell carcinoma, Paraneoplastic syndrome, Kidney cancer

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## FORENSIC MEDICAL CRITERIA OF DIFFERENTIAL DIAGNOSIS OF ALCOHOL AND CARBON MONOXIDE POISONING BY USING AZIMUTHAL-INVARIANT POLARIZATION MUELLER-MATRIX MICROSCOPY

Olexandr Harazdiuk<sup>1</sup>, Ihor Ivaskevich<sup>2</sup>, Oleh Vanchuliak<sup>3</sup>, Yuliia Sarkisova<sup>4</sup>

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### Abstract:

**Introduction:** Fatal intoxications with alcohol and carbon monoxide are the most common causes of poisoning that occur in forensic medical practice. Therefore, the differential diagnosis of these intoxications is extremely important. To solve this problem, we propose the use of the method of azimuthal-invariant polarization Mueller-matrix microscopy of histological sections of biological tissues (BT).

**Objectives:** The purpose of the study was to establish statistically significant criteria for differentiation of the cause of death in case of alcohol poisoning (AP) and carbon monoxide poisoning (CMP) by using azimuthal-invariant polarization Mueller-matrix microscopy of polycrystalline fractions of histological sections of organs and blood films of the human body.

**Results:** A number of characteristic features have been identified that have not been previously described and allow to objectively differentiate the cause of death in the case of AP and CMP, namely  $Ek - 0.95 \pm 0.045$  and  $1.81 \pm 0.092$  in the study of histological sections of the myocardium;  $Ek - 0.19 \pm 0.011$  and  $1.11 \pm 0.094$  – polycrystalline blood films. Analysis of the obtained data revealed a good level of accuracy in the study of histological sections of the myocardium (As 85%) and polycrystalline blood films (As 88%).

**Conclusion:** Thus, developed and tested method of azimuthal-invariant polarization Mueller-matrix microscopy allows to differentiate the cause of death in cases of AP and CMP.

**UDC Classification:** 616-091

**Keywords:** differentiation, carbon monoxide poisoning, alcohol poisoning, polarization, laser polarimetry.

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## **SPECTROPHOTOPOLARIMETRY AS A METHOD FOR DETERMINING THE TIME DYNAMICS OF CHANGES IN THE MORPHOLOGICAL STRUCTURE OF MUSCLE TISSUE**

**Olexandr Harazdiuk<sup>1</sup>, Nataliia Kozan<sup>2</sup>, Viktor Kryvetskyi<sup>3</sup>, Oleksandr Dunaiev<sup>4</sup>**

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### **Abstract:**

**Introduction:** The article presents the current state of issues regarding the diagnosis of pathological conditions for forensic medical experts, in particular the study of normal muscle tissue and in the presence of hemorrhages. Particular attention is paid to biophysical research methods with evidence-based accuracy, objectivity, reproducibility, and rapid results.

**Objectives:** The purpose of the research was to study the possibilities of using spectrophotopolarimetric methods to analyze and determine the relationship of morphological structure of biological tissues with the temporal dynamics of changes in their optical parameters, to establish the possibility of differentiating necrotic changes and signs of damage by applying Mueller matrices of human muscle tissue samples.

**Results:** During the study, we found a number of features and patterns of change in the properties of the laser beam as a result of passing through biological tissue. Polarization-correlation methods provide new, objective information about the dynamics of change in laser polarimetric imaging of morphological structure of biological tissues. By analyzing the statistical distributions of the ellipticity of polarization of laser images of normal human muscle tissue and in the presence of hemorrhages, the possibility of identifying the relationship between the development of statistically significant changes with increasing time of death and the possibility of differentiating them are considered.

**Conclusion:** Based on these results, we can conclude that employing laser polarization methods will allow us to open new doors in the study of the biological tissues of the human body. The results showed the effectiveness of the studied methodology and the prospect of further research in this direction.

**UDC Classification:** 616-091

**Keywords:** differentiation, muscle tissue, polarization, laser polarimetry, spectrophotopolarimetry, forensic medicine.

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## THE STUDENT NURSES' SKILL OF MANAGING THEIR TIME

Irinka Hristova<sup>1</sup>, Greta Koleva<sup>2</sup>, Despina Georgieva<sup>3</sup>

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### **Abstract:**

**Introduction:** Time is one of the basic resources in each human activity. It holds a special place in health care. Either its deficiency or underestimation may lead to the negative and even fatal aftermath for human life.

**Objective:** The purpose of this report is to identify the reasons for poor time management of student nurses.

**Methods:** A standardized questionnaire was answered by a total of 89 student nurses from the 1st year and 3rd year courses, in the nursing bachelor degree from the Ruse University of Angel Kanchev, Bulgaria. The questionnaire was held in January 2021.

**Results:** From this study we have determined that those who are capable of managing their time and always plan well are just 26%(23n) of all respondents, more than a half of them only sometimes plan their tasks, 61%(54n), whereas 13%(12n) never do. As for the compliance of the deadlines, only 31.5% (28n) of them always manage to do so, while the rest of the students only sometimes do so.

**Conclusions:** The inability of student nurses to plan their time is just one of the reasons for concern. It was determined that the lack of training for effective time management, intense workload in higher education, not realizing they have to manage their time and their young age, significantly affect the student nurses' proper management of time.

**UDC Classification:** 37.04

**Keywords:** Time Management; Student Nurses; Time Management Training; Time Planning Skills;

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## THE IMMUNE RESPONSE AGAINST RABIES VIRUS AMONG CANINE DONORS IN A ROMANIAN BLOOD BANK

**Teodor-Stefan Ionescu<sup>1</sup>, Marius Dan<sup>2</sup>, Dragos Cobzariu<sup>3</sup>,  
Stelian Baraitareanu<sup>4</sup>, Doina Danes<sup>5</sup>**

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**Abstract:**

**INTRODUCTION:** Seventy-six samples were collected from sixteen canine blood donors at every blood donation performed in accord with the canine donor selection guidelines. Statistical analysis of ELISA OD values revealed no significant variation of anti-rabies antibodies values during repeat donations. Our results support the statement that blood donation does not affect the immune status of donors.

**OBJECTIVES:** The study aimed to assess the immune status against rabies among the canine blood donors in a Romanian canine blood bank

**METHODS:** Serum samples (n=76) were collected from pet owned dogs (n=16) recorded in the blood bank register of a Romanian blood bank were performed with the immunological status of the investigated canine blood donors was evaluated using the indirect ELISA commercial kit PLATELIA RABIES II (BIO-RAD, France) as per the manufacturer's instructions

**RESULTS:** The overall picture of ELISA OD results revealed non-significant variation between and within D1-D6 groups of values ( $p > 0.05$ ,  $F < F_{crit}$ ).

**CONCLUSION:** The next studies topic would be to compare the results provided by the ELISA technology with FAVN.

**UDC Classification:** 616.9

**Keywords:** blood transfusion; blood donation; canine blood bank; ELISA OD; rabies

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## PROTECTIVE ACTIVITY OF LEMNA MINOR L. IN CHRONIC BLEOMYCIN-INDUCED LUNG INFLAMMATION

Yanka Karamalakova<sup>1</sup>, Iliana Koleva<sup>2</sup>, Tzvetelin Georgiev<sup>3</sup>,  
Muhammad Akram<sup>4</sup>, Galina Nikolova<sup>5</sup>

**Abstract:** This research investigates the probable effects of induced chronic (28 days) lung inflammations by Bleomycin (BLM) and its oxidative-toxicity protection by the aquatic extract of Lemna minor L. (LME). Balb/c male mice were in every two days exposed to: (1) a controlled normal diet, (2) an LME treatment (120 mg/kg bwt, i.p.), (3) a BLM treatment (0.34 U/kg bwt, i.p.), and (4) an LME (120 mg/kg bwt, i.p.) administered two hours prior to the BLM. At the 30 experimental days of chronic BLM administration, the mice were sacrificed and fresh lung tissue was collected for biochemical determination and EPR analysis. The BLM treatment significantly increased the biochemical indices two-fold (SOD, CAT, MDA, TC) than controls. Furthermore, lung/alveolar cell experiments were performed to investigate the LME modulative and oxidative-protection effect. The results revealed that LME alone and in combination (LME + BLM) inhibited BLM expression by significantly reducing EPR-ascorbate ( $p < 0.05$ ), ROS production ( $p < 0.05$ ), and by enhancing enzymatic antioxidants. As a conclusion, our results indicated that chronic BLM toxicity and lung inflammation could be neutralized by long-term LME treatment. Therefore, LME + BLM prevented the detrimental impacts of BLM and have proved to have a potential therapeutic effect on the oxidative stress biomarkers, antioxidant enzymes and alleviation of lung inflammations.

**UDC Classification:** 604

**Keywords:** LME, BLM, ROS, lung inflammations

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## DETERMINATION OF THE NUMBER OF NURSES FOR HOSPITAL AID IN THE REPUBLIC OF BULGARIA

Greta Koleva<sup>1</sup>, Despina Georgieva<sup>2</sup>, Irinka Hristova<sup>3</sup>

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### Abstract:

**Introduction:** The nurses in the Republic of Bulgaria addressed a number of official demands to the Ministry of Health, one of them was to work out a long-term strategy for the development of standards, including detailed minimal requirements for the number of staff for both hospital, and outpatient care.

**Objectives:** The goal of the current report is a summary of the regulatory documents, concerning the number of nurses in the Republic of Bulgaria, in context of the global practices.

**Methods:** Current medical standards in the Republic of Bulgaria are being taken into account, and methods for determining the number of nurses in other countries.

**Results:** In the period between November and December 2020, within the public consultations for projects of different Regulations for approval of medical standards, the proposed and developed methods by the Bulgarian association of health professionals in nursing to be included in the standards, which concern calculating the necessary staff of nurses, was not admitted for inclusion in any of those standards.

**Conclusions:** Until now, the number of active nurses in the Republic of Bulgaria in all active medical standards is calculated either on the basis of doctors (not patients), or it's pointed out that the methods of calculating the sufficient number of nurses may be applied. It should be noted that the International Council of Nurses, actually does not recommend universal methods for all countries worldwide.

**UDC Classification:** 331.1

**Keywords:** Nurse Staffing Norms; Workforce Planning; Nurse; Employment; Nurse-to-patient ratio;

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## MATERNAL LEUKOCYTOSIS AS DIAGNOSTIC MARKERS IN SPONTANEOUSLY DECLARED PRETERM BIRTH

Iliana Koleva-Korkelia<sup>1</sup>

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**Abstract:** Spontaneous preterm birth is the basic problem of perinatal mortality in Bulgaria. Pregnancy is characterized by physiological leukocytosis - determined by twice increased neutrophils levels, unchanged monocyte levels, and a reduction in the levels of lymphocytes, eosinophils, and basophils. The leukocytosis is particularly pronounced in the last trimester, due to physiological stress during pregnancy, and it is a result of the increased inflammatory response, a consequence of selective immune tolerance, immunosuppression, and fetus-immunomodulation.

The objective of this study was to investigate and to appreciate maternal leukocytosis as potential diagnostic markers in spontaneously declared preterm birth and term birth declared cases.

**Methods:** The case-control study was performed in UMBAL-City Hospital, Stara Zagora during 2017–2020. The study involved 200 patients, split into two groups: G1- the healthy pregnant women,  $n_1=100$  with a registered singleton pregnancy, at gestational age 37-39<sup>+6</sup>, gave birth on the term (TB); G2- the PTB patients,  $n_2=100$ , confirmed clinically by cardiotocography for gestation >32 weeks. The highly sensitive Leuko-TIC-ELISA-WBC (upper limit of the normal number of Leuc during pregnancy -  $15 \times 10^9$  per L) test was used for investigation. Blood samples were taken by puncture of the v.cubitalis in an anticoagulant at the time of hospitalization and examined within 1 hrs. Patients with systemic chronic illness and infections were excluded from the study.

The results showed statistically significant Leuc reduction in SPTB patients ( $14.31 \pm 2.66 \times 10^9/L$ ,  $p > 0.03$ ), compared to the increased ( $14.67 \pm 3.21 \times 10^9/L$ ) (in normal- $15 \times 10^9/L$ ) Leuc values in the TB group. In conclusion, the results of the Leuc value confirm the presence of a systemic leukocytosis/oxidative inflammatory reaction at the time of declaring SPTB and TB.

**UDC Classification:** 618

**Keywords:** Leuc, sPTB, TB, leukocytosis

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## AZADIRACHTA INDICA OIL AS PROTECTOR OF CHRONIC OCHRATOXIN-INDUCED NEPHROTOXICITY

Iliana Koleva-Korkelia<sup>1</sup>, Yanka Karamalakova<sup>2</sup>, Galina Nikolova<sup>3</sup>

**Abstract:** Ochratoxin A (OTA) mycotoxin affects protein synthesis, metabolic oxidative pathways and ROS mediation. In the present study, we investigate the antioxidative-therapeutic potential of *Azadirachta Indica Oil* (*A. indica*) against chronic (28 days) OTA-induced nephrotoxicity. Balb/c male mice were exposed to i.e., (1) controls; (2) *A. indica* treated (120 mg/kg b. wt. i.p., given every two days); (3) c) OTA treated (Isolate D2306, 1.25 mg/kg b.wt., i.p., given every two days); d) *A. indica* (120 mg/kg b.wt., i.p.) administered 2h prior to OTA-administration. Till the end of the 28 experimental days of chronic OTA-nephrotoxicity, the mortality rate ( $\pm 0$ ) was not observed in mice. Kidney tissue was subjected for the determination of biochemical indexes (the MDA ratio, and antioxidant capability of SOD, and GSH) and EPR- ROS productions. OTA-exposure resulted in twofold significant increases in SOD ( $p < 0.004$ ), GSH ( $p < 0.05$ ) and malondialdehyde (MDA) levels ( $p < 0.00$ ), compared to controls. Further, a nephro-cells experiment was performed to investigate the oxidative stress-protective action of *A. indica*. Our results showed that *A. indica* oil and *A. indica* +OTA combination inhibited OTA-induced nephrotoxicity via a significant reduction of lipid peroxidation ( $p < 0.003$ ), ROS production ( $p < 0.005$ ), and endogenous antioxidant activation. Thus, it can be concluded that *A. indica* treatment neutralized chronic OTA-induced nephrotoxicity, not only by reducing lipid peroxidation but also by improving antioxidant status. Through the present experiments, it was demonstrated that *A. indica* has protective potential in nephron-inflammations.

**UDC Classification:** 604

**Keywords:** *A. indica*, OTA, ROS, nephron-inflammations

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## C-REACTIVE PROTEIN LEVELS - INDICATOR FOR PROGNOSIS OF SPONTANEOUS PRETERM BIRTH IN BULGARIAN WOMEN

Iliana Koleva-Korkelia<sup>1</sup>, Yanka Karamalakova<sup>2</sup>

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**Abstract:** It is estimated that every year fifteen million premature babies are born worldwide mainly due to spontaneous preterm birth (sPTB). Furthermore, in clinical settings, there still are no reliable and accurate tools to predict preterm labor. Hence, the aim of this pioneering research was to estimate the relationship between the maternal inflammatory indicator and sPTB in a case-control study between 220 South Bulgarian women. The study was conducted at UMBAL, Stara Zagora, Bulgaria (2017-2020) and enrolled a total of 220 women, determined into two groups: 1) TB (n = 110), who were to give birth at term  $\geq 37$  to  $\leq 39 + 6$  gestation weeks with active labor at the time of hospitalization; and 2) sPTB (n = 110), women with preterm birth  $\leq 32-34 + 6$  gestation weeks and declared active labor, who were to give birth within 5-24 hrs. The inflammatory indicators/CRP concentration was quantified in plasma by immunoturbidimetric methods within 2 hrs. in mg/l. The median maternal CRP ( $8.77 \pm 3.91$ ), with cutoff = 4.9 mg/l was identified as optimal inflammation with highest risk of sPTB (sensitivity = 86.6%; specificity = 53.7%,  $p < 0.0001$ ). Moreover, a cutoff CRP = 4.9 mg/l was found to be most effective in determining maternal age  $\leq 19$  years, the sensitivity of 68.6%, and positively correlated OR = 8.122 vs. OR = 2.354, with increased total sPTB risk at  $\leq 32-34 + 6$  weeks, respectively ( $p < 0.001$ ).

In conclusion, increased CRP concentrations and a decreased maternal age were associated with increased risks of sPTB, before  $\leq 32-34 + 6$  weeks. Minimal inflammation and other factors in combination may also act as sPTB prognosis.

**UDC Classification:** 618

**Keywords:** CRP, preterm birth, term birth, inflammation

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## STUDENTS' VIEWS ON THE ROLE OF ETHICS EDUCATION FOR THEIR FUTURE MEDICAL PRACTICE

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Svetlin Georgiev<sup>5</sup>, Antoniya Yanakieva<sup>6</sup>

### Abstract:

**INTRODUCTION:** Worldwide, in different ways, ethical dilemmas arise in medicine and life sciences. It is critical for medical professionals to respond with confidence when ethical challenges are addressed in their clinical practice. Medical ethics and bioethics education is recognized as an essential course of the medical curriculum. The course aims to provide students with knowledge and competencies on dealing with moral problems.

**OBJECTIVES:** In this article, we aim to explore students' views about the importance and role of medical ethics education for their future practice. Their suggestions on specific medical ethics and bioethics topics were also considered, as well as previous knowledge on ethics before they enrolled in university.

**METHODS:** A paper questionnaire was developed and distributed among first-year foreign medical students from the Faculty of Medicine in the Medical University-Sofia in Bulgaria. All students participated in the study anonymously and voluntarily. The study was conducted during January and February 2020.

**RESULTS:** Completed questionnaires were received from 366 medical students. Data collected demonstrates that only 19% of the students were taught ethics before enrolling in university and covered topics on philosophy and ethics, civil and human rights. The majority (92%) of the responders believe that the study of medical ethics and bioethics helps medical professionals to improve their skills in identifying ethical problems in their everyday practice. Interesting were the suggestions for topics in medical ethics and bioethics that needed further study during lectures and seminars and included principles of medical ethics and bioethics, ethical behavior in medicine and health care, ethical dimensions of new technologies in health care, ethical dimensions of clinical decisions and patients' quality of life, ethics and health management.

**CONCLUSIONS:** Medical ethics education is significant for future physicians, helping them to improve their skills in identifying ethical issues, and base their decisions on fundamental ethical principals in their everyday practice. Attention should be given to topics related to principles of medical ethics, models of patient-physician relationships, new technologies in health care, ethics and health policy.

**UDC Classification:** 614.2

**Keywords:** bioethics, medical ethics education, ethical dilemmas.

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## OPTIMIZING MOLECULAR DOCKING PROTOCOLS OF PYRROLE CONTAINING MAO-B INHIBITORS THROUGH CORRELATION COEFFICIENTS

Emilio Mateev<sup>1</sup>, Iva Valkova<sup>2</sup>, Diana Tzankova<sup>3</sup>, Maya Georgieva<sup>4</sup>, Alexander Zlatkov<sup>5</sup>

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**Abstract:** Virtual screening is emerging as a highly applied technique for the search of hits since it significantly reduces the time required for the establishment of novel, effective compounds compared to high-throughput screening. Implementing correlation coefficients to determine if a molecular docking study is robust and reliable has been established as common practice in recent years. The aim of this work was to determine if a relevant pairwise correlation between the scoring functions (ChemPLP, GoldScore, Chemscore and ASP) of the docking software GOLD 5.2 and previously determined experimental data of pyrrole derivatives with MAO-B inhibitory activity could be achieved. In order to optimize the correlation coefficient, we calculated the Pearson's and Spearman's coefficients after each docking simulation with all four GOLD 5.2 scoring functions. Thereafter, we varied three changeable parameters – the size of the grid space, the side-chain flexibility and the presence of water molecules in the active site, to perceive if we could obtain better correlation values. The highest R<sup>2</sup>=0.79 was attained with the following docking settings: scoring function ChemPLP, grid size 12Å and no rotatable side chain residues. This work provides an applicable GOLD 5.2 docking protocol for a future virtual screening of novel MAO-B inhibitors with pyrrole moiety.

**UDC Classification:** 615.3

**Keywords:** ensemble docking, MAO-B inhibitors, GOLD docking, correlation

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## ANALYSIS OF DIFFERENT PREVENTIVE MEASURES TO IMPROVE HOME OFFICE ERGONOMICS – RESULTS FROM A STUDY ON THE FIRST WAVE OF THE COVID-19 PANDEMIC IN LATVIA

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Sarmīte Rozentāle<sup>5</sup>, Ieva Grīntāle<sup>6</sup>, Iveta Mīetule<sup>7</sup>, Jelena Lonska<sup>8</sup>,  
Lienīte Litavniece<sup>9</sup>, Iluta Arbidāne<sup>10</sup>

### Abstract:

**Introduction:** Telework, also known as remote work, distance work, telecommuting, was gaining popularity already before the COVID-19 pandemic. Despite benefits, telework can also cause workers' mental and physical health, and forced telework during the COVID-19 pandemic has promoted the onset of these problems.

**Objectives:** The objective of the study was to analyze the management of ergonomics in teleworking workplaces and the association between pain longer than three days and preventive measures provided by employers in Latvia during the 1st emergency restrictions, which were in force between 12 March and 9 June 2020 due to the COVID-19 pandemic.

**Methods:** Web-survey was used to gather information from respondents – workers. In total, 1006 workers fully filled in the questionnaire in October 2020. Four hundred eighty-three teleworkers of both genders were identified.

**Results:** 35.7% of respondents reported pain longer than three days. The odds of pain were increased in case of lack of all analyzed preventive measures. For those who reported not being provided with a computer and other IT equipment OR for pain was 1.50 (CI 0.95-2.37). Even higher OR was observed in case of not receiving advice on how to arrange an ergonomic workstation (OR= 2.37, CI 1.32-4.25) and not having identified working conditions (OR= 2.61, CI 1.43-4.77). The highest risk was observed if the employer had not provided an office table and office chair (OR=5.46, CI 1.78-16.80).

**Conclusion:** Teleworkers not receiving support from the employer on the arrangement of home offices have an increased risk of having pain for longer than three days. Provision of an office worktable, an office chair, advice on how to arrange an ergonomic workplace and provision of workplace risk assessment are key measures to be taken by the employer to improve home office ergonomics of their workers.

**JEL Classification Numbers:** J81

**Keywords:** telework, distance work, working at home, COVID-19, musculoskeletal pain, ergonomics

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## JUSTIFYING THE NEED FOR IMPROVED HEALTH EDUCATION OF OBESE ADULT PATIENTS IN BULGARIA

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**Abstract:** Bulgaria is the second-fastest aging nation in Eastern Europe and fifth in the world. Older people are the largest and ever-growing group of people in health care. The most common diseases in this age group are circulatory, endocrine, digestive, musculature, neoplasms, and respiratory systems. Some of the main reasons for these diseases include an unhealthy diet, a sedentary lifestyle, and obesity.

One hundred twelve adult patients with chronic diseases were interviewed.

The aim of the study is to establish the awareness of older people about overweight-related problems. In order to increase their knowledge and improve their quality of life and independence, we prepared a training program (Table4).

**UDC Classification:** 614.2

**Keywords:** elderly people, obesity, training, quality of life.

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## HYDROXYCHLOROQUINE FOR THE PREVENTION OF NEW CORONAVIRUS INFECTION COVID-19 IN HEALTHCARE WORKERS

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**Abstract:** Hydroxychloroquine (HCQ) was widely used to treat coronavirus disease (COVID-19) at the beginning of the pandemic; later, it was suggested for COVID-19 prophylaxis. Our study analyzes the phone interview results of 1332 healthcare workers who participated in a prophylactic program abbreviated DOC-COVID organized by the Moscow Healthcare Department. 897 participants took HCQ at least for a few days for COVID-19 prophylaxis, and 425 agreed to participate as a control group. Positive PCR test was reported by 65 (15,3%) participants from the control group and 100 (11,1%) from HCQ group. Pneumonia was diagnosed in 30 (7,1%) participants from the control group and 38 (4,2%) from the HCQ group. Side effects were reported by 27 participants from the control group and 138 from the HCQ group. The most frequent side effects were nausea (11 and 45), diarrhea (15 and 47), headaches (3 and 19), abdominal pain (5 and 21), fatigue (6 and 20), palpitation, and arrhythmia (10 and 12) in control and HCQ group respectively. A severe allergic reaction was reported in two cases in the HCQ group. We checked reported by phone positive PCR with registered in Moscow Healthcare Department database results and confirmed 73,2% of results were actually registered. Our data showed no statistically significant difference between the two groups, so our results confirm that HCQ is not effective for COVID-19 prevention.

**UDC Classification:** 614.4

**Keywords:** COVID-19, hydroxychloroquine, prophylaxis, side effects

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## **NURSING STUDENTS' VIEWS ON WORKING WITH CHILDREN WITH DISABILITIES**

**Monika Obreykova<sup>1</sup>, Galina Terzieva<sup>2</sup>**

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### **Abstract:**

Highly qualified nurses and regular training programs for innovative and efficient medical practices are very important for the provision of health care facilities for children with disabilities.

**Purpose:** To study the motives of nursing students for choosing to work with children with disabilities; to know about their opinion about the sufficiency of the duration of their internship and the undergraduate internship in centers for with children with disabilities; to understand the factors influencing the professional competencies of nursing students to work with children with disabilities.

**Materials and methods:** A survey was conducted among 219 students majoring in Nursing through a structured questionnaire.

Students expressed their opinion that the duration of the internship in institutions for children with disabilities should be increased [ $t(2017) = 12.387$ ;  $p\text{-level} < 0.001$ ]. They indicated their willingness to work with children with disabilities [ $t(217) = 15.432$ ;  $p\text{-level} < 0.001$ ]. Students shared that they experience higher psycho-emotional stress while working with children with disabilities [ $t(217) = 7.337$ ;  $p\text{-level} < 0.001$ ]. They also believed that the introduction of an elective subject on children with certain types of disabilities would improve their preparedness [ $t(217) = 8.562$ ;  $p\text{-level} < 0.001$ ].

**Conclusion:** The study revealed that the nursing students believe that the present model of student training related to the care of children with disabilities require changes in the following ways: introduction of a separate module Nursing care for children with disabilities; introduction of an elective course on nursing care for children with disabilities; application of pedagogical and psychological approaches for developing the skills for coping with stress; increasing the duration of the internship in the fourth year of study for working with children with disabilities.

**UDC Classification:** 614.2

**Keywords:** students, disabilities, children, motivation

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## ASSESSMENT OF THE COMMUNICATIVE ABILITIES OF STUDENTS IN MEDICAL SPECIALTIES DURING THE ONLINE TRAINING PERIOD

Monika Obreykova<sup>1</sup>

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### Abstract:

**Purpose:** Communication skills are very important in the medical profession. Challenging for the teachers to develop the communication skills of future medical specialists through online classes during Covid-19.

**Aim:** To study the opinion of students about the importance of communication skills and its development through online classes during Covid-19, as well as to know the factors hindering the development of the communication process.

**Materials and methods:** A survey was conducted among 81 students in the field of "Health Care" majoring in "Nursing", "Midwifery" and "Medical Assisting" through a questionnaire. The data has been analyzed with the help of SPSS.

**Conclusion:** 67% of the students indicated that online learning will hamper the development of their much-needed communication skills to communicate with the patients. The results show difficulties in the implementation of quality health care which must be overcome. There is a need to improve the communication skills of the health care students by conducting special courses to overcome the deficiencies of online learning during Covid-19.

Communication skills are extremely important in the medical profession. It is challenging for teachers to develop the communication skills of future medical professionals through online classes during Covid-19. In the present study, students' opinion about the importance of communication skills and their acquisition during the pandemic through online classes, as well as the factors hindering the development of communication skills were studied. The present study reveals that most students majoring in nursing, midwifery and medical assisting lack communication skills, particularly in their communication with patients with disabilities. This problem is related to the flaws in the educational system for medical professionals, which prepares them to work in the real world.

It is established that a need for approbation and introduction of educational programs to develop the communication skills and to overcome the deficiencies of the online training during Covid-19 in this regard.

**UDC Classification:** 614.2

**Keywords:** training, communication, students, Covid-19

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## THE EXPERIENCE OF A NEWLY IMPLEMENTED ONLINE LEARNING PLATFORM FOR MEDICAL STUDENTS

**Marina Ruxandra Otelea<sup>1</sup>, Elena Juganaru<sup>2</sup>, Ana Maria Balan<sup>3</sup>,  
Bogdan Viorel Vilceleanu<sup>4</sup>, Elena Merlusca<sup>5</sup>, Agripina Rascu<sup>6,7</sup>**

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### **Abstract:**

**INTRODUCTION:** In the context of the current public health emergency, an adequate adjustment imposed a transition from a conservative approach to medical education to online teaching and interaction. E-learning also brought advantages to the students, which were assessed in this survey in order to learn how to keep and benefit from them in the future.

**METHODS:** the data was collected through a questionnaire which included general data (gender, year of study) and the self-perceived progress. Specific questions addressed the quality of the teacher-student communication, or the advantages e-learning offered, while the platform's functionalities were analyzed through a five-point scale.

**RESULTS:** Among the 536 respondents, 99.81% mentioned at least one feature used specifically in the online training that would be valuable to retain in the future. Students perceiving progress better than expected had a higher appreciation of the e-learning tools. Gender differences in opinion were only correlated with the standardization of the studying process. While time management was accepted as a main advantage, 25% of the participants considered the overall communication better than before. A major disapproval regarding online communication was encountered in years 3, 4, and 5, while the desire to continue the communication through the existing platform was the highest in the first and last year of study.

**CONCLUSION:** Even in a blended learning process, the digital delivery of medical training needs further improvement and adaptation in order to align with the fast-developing society and its expectations.

**UDC Classification:** 614.2

**Keywords:** medical training, e-learning, COVID-19<sup>1</sup>

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## A QUANTITATIVE ASSESSMENT OF AN INNOVATIVE EDUCATION PROJECT FOR PHARMACY STUDENTS

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**Abstract:** The changing environment of pharmacy care represents an opportunity to implement an innovative educational form into the teaching process, which represents a significant potential in preparing pharmacy students for their future profession. The main objective of the assessment was to evaluate the contribution of the innovative education project *Advanced Training in Pharmacy Care* (ATIP) as a complement to the compulsory curriculum at the Faculty of Pharmacy of the Comenius University in Bratislava. Another objective was to analyse the obstacles to dispensation and counselling perceived by students of the educational project. The assessment uses data from the ATIP educational project carried out between 2015/2016 and 2020/2021 at the Faculty of Pharmacy of the Comenius University in Bratislava. Data collection was provided through a questionnaire survey among the participating students after completing each year of the project. The assessment focused on students' perception of the ATIP educational project, characterizing their readiness to provide pharmacy care and obstacles to the implementation of pharmacy care. Students perceived the project as an interesting addition to the curriculum, which was organized at a high professional level with reasonable difficulty. In the case of their readiness for their future profession by studying and passing compulsory practice, students were critical in their answers. Obstacles affecting the implementation of pharmacy care that prevailed among students were a lack of practical experience, a lack of time to address the patients' problems, and different requirements of patients from the knowledge acquired during study at the faculty. In other obstacles, such as a patient's lack of interest, lack of privacy to talk, etc., students have taken a neutral stance. This innovative education project pointed out the importance of cooperation between various organisations, such as academic, pharmaceutical and student, in the field of education of future health professionals.

**UDC Classification:** 614.2

**Keywords:** pharmacy students, Advanced Training in Pharmacy Care educational project, innovative education

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## PREVALENCE OF PREMENSTRUAL SYMPTOMS AMONG BULGARIAN WOMEN

Diana Popova-Dobrev<sup>1</sup>

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### Abstract:

**INTRODUCTION:** Premenstrual symptoms are common and can worsen women's quality of life. This study examines the prevalence of premenstrual symptoms such as weight gain; swelling of ankles, feet, and hands; frequent change of mood; fatigue; difficulty concentrating; depression; nervousness and irritability; and nausea.

**OBJECTIVES:** The objectives of this study are: (1) to reveal the prevalence of premenstrual symptoms among Bulgarian women and (2) to establish how the presence of premenstrual symptoms affects the Emotional well-being of women.

**METHODS:** The applied methodology includes an online-based anonymous study, which focuses on the prevalence of premenstrual symptoms among Bulgarian women and their emotional health. A characteristic of the studied contingent on age, BMI, and physical activity was made.

**RESULTS:** The results of 126 women surveyed were analyzed. Of these, 96.8% have at least one premenstrual symptom. 30.2% have one or two symptoms, 43.7% have 3-4 symptoms and 23% have 5-8 symptoms. 14.8% of women with symptoms reported worsening of their symptoms because of increased stress associated with COVID-19. There is a statistically significant correlation between the number of symptoms and the emotional well-being of women.

**CONCLUSION:** The prevalence of premenstrual symptoms is common among the studied Bulgarian women. A greater number of symptoms has a negative effect on women's emotional well-being. We consider it appropriate to introduce the application of physiotherapeutic methods as well as alternative therapies for the treatment and prevention of premenstrual syndrome.

**UDC Classification:** 618

**Keywords:** Premenstrual symptoms, Emotional well-being; Bulgarian women

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## **IS ANYBODY KEEPING THE CODE IN BULGARIA? A STUDY TO EXPLORE LOCAL PARENTS' AWARENESS REGARDING THE INTERNATIONAL CODE FOR THE MARKETING OF BREAST-MILK SUBSTITUTES.**

**Ivanichka Serbezova<sup>1</sup>, Daniela Lyutakova<sup>2</sup>**

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### **Abstract:**

This paper reviews Bulgarian parents' awareness concerning the existence of the WHO Code for the marketing of breast-milk substitutes and how it can help them optimize their breastfeeding journey. Frequently occurring problems and breaches of the Code in Bulgaria are discussed, and their context explained. We focus on parental attitudes and investigate whether they acknowledge the significant necessity for a Code-compliant prenatal education and postnatal care. We also explore their viewpoints on the implementation of the Code and maximizing compliance with it on a local level. The research findings are presented graphically, and we present tendencies showcased by respondents' opinions they have expressed in the survey.

**OBJECTIVES:** Purposes of this research are: (1) to explore parents' awareness about the WHO Code and their encounter with local prenatal classes in this regard (2) to assess their viewpoints on implementing the Code and if they see it as a significant step towards an optimal breastfeeding experience.

**METHODS:** The methods we applied include an online-based cross-sectional semi-quantitative questionnaire with closed-ended and open-ended questions, aiming to explore parents' current knowledge and viewpoints in regard to the Code and its implementation in Bulgaria. The research has been carried out via social media, and it samples parents from a local parent peer support group. Acquired data from closed-ended questions is presented, demonstrating percentages and tendencies.

**RESULTS:** A total of 463 respondents are included

**CONCLUSION:** It is a common practice in Bulgaria for prenatal classes not to comply with the WHO Code. Disregarding recommendations and evidence-based medicine, both some experts and companies under the scope of the Code breach its main points. Code-compliant prenatal education is practically almost non-existent with the lack of midwife-led care and classes, predominantly in the private sector, where they are almost entirely, sponsored by those companies. Nearly all parents included in this survey are more than willing and motivated to have access to Code-compliant prenatal education and postnatal care. The lack of such leaves almost no choice for Bulgarian parents actually to have access to code-compliant education and care. This inevitably influences their decision making, attitudes and behavior, potentially leading to lower breastfeeding rates and suboptimal breastfeeding satisfaction and success. Adequate measures must be reinforced to ensure implementation and proper legislation, providing monitoring and enforcement, protecting parents and their babies when they are most vulnerable.

**UDC Classification:** 618

**Keywords:** breastfeeding, lactation, formula, healthcare, midwife, breast-milk

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## LIFE QUALITY OF PATIENTS WITH RHEUMATOID ARTHRITIS ACCORDING TO THE LEVEL OF PAIN

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### Abstract:

This is a transversal (cross-sectional) descriptive study. The aim of the study is to evaluate the quality of life of patients with rheumatoid arthritis

Objectives: To identify the level of pain related to daily activities in patients with RA according to gender and age groups.

Methodology: The data collection was conducted in January-May 2019. The sample was randomly selected. In this study, there were 70 patients with RA. These patients were provided an internationally standardized questionnaire, administered by us that measures the level of pain experienced by the patient in carrying out daily activities. Questionnaires with patients were conducted at QSUT "Mother Theresa". Before the interview began, patient and family consensus were obtained. To analyze the statistical data, SPSS Version19 and Excel 2010 were used. The Pearson Correlation for IC=99%,  $p<0.01$  was applied.

Results: The average age of patients is 55.2 years old, the minimum age is 24 years old, the maximum age is 72 years old. In a distribution by age groups, it turns out that 59% of these patients are aged 50-59 years old. From this study it is seen that the highest percentage of patients with RA is Tirana (45%). We found that women are not only more affected than men by rheumatoid arthritis, specifically 84% of women, but also women have much worse quality of life due to very severe pain from RA. Of our surveyed group, 20.3% of affected females have very poor quality of life but no affected males have very poor quality of life from AR pain. Men in 100% of cases have poor quality of life from RA pain compared to 72.9% of women. The age group experiencing the most severe pain and having a very bad quality of life is 20-49 year olds with 25% of the cases. The age group  $\geq 70$  years old has the worst quality of life from AR pain in 100% of the cases studied.

Conclusions: 77% of these patients have poor quality of life because of pain associated with RA. The FSI for pain resulted in 0.25, 0.39 for addiction and 0.26 for difficulty.

**UDC Classification:** 612.7

**Keywords:** arthritis, life quality, pain, patient.

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## ORGANIC PERSONAL CARE COSMETICS: BEHAVIOR OF CHOICE AND CONSUMPTION

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### Abstract:

**Background.** The researchers have shown that even small doses of some chemical substances in cosmetics, when absorbing and accumulating in the body, can damage the skin and provoke various diseases. Therefore, the choice of organic cosmetics with certified ingredients can contribute to human health and nature conservation.

The survey aimed to determine behavior of choice and consumption of organic cosmetic products according to the consumers' socio-demographic characteristics.

**Methods.** A quantitative survey was performed, a validated questionnaire and data collection method – a written survey were used. Survey sample – 335 people ( $38.5 \pm 4.07$  years old). Data analysis using SPSS 26.0 was performed, calculated percentage frequencies, mean, Pearson's Chi-Square test to detect statistically significant differences, and Spearman's correlation was used.

**Results.** The study found that more than half of women used organic cosmetics. A significant difference ( $p < 0.05$ ) was found with age, which showed that organic products were used significantly more often by 26–35-year-old individuals and between the sexes ( $p = 0.05$ ). It was found that facial skincare, body care, and hair care products are the most commonly used, while pregnancy skincare products are the least commonly used. Consumers indicated the reasons for choosing these products: health benefits, natural composition, non-polluting environment during production, and recyclability of packaging. Most often, respondents do not use such cosmetics due to unclear labeling and the higher prices of these products. Sufficient and complete information on the label, a reliable and well-known producer are considered to be the most important identification criteria. In contrast, a special point of sale, clear and attractive promotional/visual information being the least important.

**Conclusions.** The study has shown that organic cosmetics consumption varies between consumers of different gender and age. However, the education and income of consumers did not affect this choice. The type of organic cosmetic products differs according to consumer socio-demographic characteristics – gender, age, education, and income. In addition, the results of the study suggest that special attention should be paid to the choice of cosmetic products for women during pregnancy and products for skincare of infants and young children. Main reasons for choosing organic cosmetics were health benefits, natural composition, non-polluting production and recyclable packaging. However, unclear labeling and higher price are the main reasons for not choosing organic cosmetics. The identification criteria of organic cosmetics varied by consumer gender, income, and education, but the age didn't have any meaning. This study has found that consumers lack knowledge about eco-labeling of personal care cosmetic products. Further research is needed in this area.

**UDC Classification:** 646.7

**Keywords:** organic personal care products, choice, consumption.

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## **eRESEARCH IN THE DEGREE OF ADHERENCE BY ASTHMA PATIENTS – A PILOT STUDY**

**Anna Todorova<sup>1</sup>, Antoaneta Tsvetkova<sup>2</sup>, Silvia Mihaylova<sup>3</sup>**

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### **Abstract:**

**Introduction:** Non-adherence to treatment is a global issue which in recent years has reached epidemic proportions. The WHO has reported that treatment adherence in chronic patients is 50% in developed countries on average. According to data from the Association of Bulgarians with Bronchial Asthma (ABBA) the percentage of asthma patients who are not regularly treated is the highest compared with other chronic diseases. Non-adherence to treatment not just influences the patient's quality of life but increases the health care costs in society.

**Objectives:** The aim of this study is to analyse the degree of adherence to prescribed treatment in asthma patients.

**Methods:** An anonymous survey was made among 50 outpatients with asthma using an adapted survey card consisting of two parts: a questionnaire that collects information about the demographic profile of the patient (gender, age, educational background, etc) and a validated tool, the Morisky test, which is a questionnaire that defines the degree of treatment adherence.

**Results:** The results from the Morisky test (Morisky coefficient 2.22) showed a mean degree of adherence both for the whole sample and for men and women separately, with a minimal difference of 0.01 in favour of men (Morisky coefficient 2.24 in men and 2.23 in women).

**Conclusions:** The studied asthma patients show unsatisfactory adherence to the prescribed treatment. The mean degree of adherence reported in the study indicates the need for educating patients, monitoring and collaboration among doctors, patients, pharmacists and other healthcare professionals.

**UDC Classification:** 615.1

**Keywords:** asthma, adherence, Morisky test

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## SURFACE ROUGHNESS OF LITHIUM DISILICATE PRESS CERAMICS AFTER DIFFERENT TYPES OF POLISHING

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Svetlin Alexandrov<sup>4</sup>, Zlatina Tomova<sup>5</sup>

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**Abstract:**

**INTRODUCTION:** The smoothness of a ceramic's surface is very important of its esthetic and prophylactic qualities.

**AIM:** The purpose of this investigation is to study the possibilities of polishing lithium disilicate ceramics after making a correction on the glazed ceramic surface.

**MATERIALS AND METHODS:** The subject of the study were 20 test samples made of lithium disilicate press ceramics. They were divided into 4 groups according to the method of processing and polishing. Group 1 was treated with a red diamond bur and polishing set; Group 2 was treated with a green diamond bur and polishing set; Group 3 was treated with a red diamond bur, polishing set and diamond paste; Group 4 was treated with a diamond bur with green coding, polishing set and diamond paste. The samples were examined with an atomic force microscope to observe the change in surface relief. The reference point for comparison was the surface of the glazed ceramic.

**RESULTS:** After polishing with diamond paste, the surface became smoother compared to the treatment of the surface with a polishing kit alone.

**CONCLUSION:** Regardless of the polishing protocol used, there was a difference in the topography of the ceramic surface before and after treatment.

**UDC Classification:** 616.31

**Keywords:** brushes, bur, paste, polishing

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## CLINICALLY EVALUATED ACCURACY OF SINGLE GUIDED IMPLANTATIONS WITH TWO DIFFERENT SYSTEMS – PRELIMINARY RESULTS

Angelina Vlahova<sup>1</sup>, Stefan Zlatev<sup>2</sup>, Boyan Pavlov<sup>3</sup>, Ivan Chenchov<sup>4</sup>, Viktor Hadzhigaev<sup>5</sup>

### Abstract:

**Introduction:** Guided single implant placement ensures an optimal implant position, enables in-surgery immediate loading, and creates a predisposition for predictable treatment results.

**Aim:** This article aims to present the surgical and loading protocols and assess the accuracy of two guided implant systems.

**Materials and methods:** Ten patients missing a single molar were included. The semi-guided procedures with the two implant systems – AB Dental and Alpha Bio-Tec, were randomly assigned to each participant. The computer-assisted planning was performed with Implant Studio (3Shape, Denmark). Surgical guides and long-term, temporary, screw-retained restorations were virtually generated within the 3Shape system. Surgical appliances were printed from SG resin (Formlabs, USA), and crowns were milled from Telio CAD (Ivoclar Vivadent, Lichtenstein). Planning accuracy was evaluated based on the crown's fit and relation to the adjacent teeth and antagonists.

**Results and discussion:** The patients included for preliminary analysis (6 female and 4 male) were with a mean age of 33.42. The youngest was 24, and the oldest 49 years old. There were no surgical and technical complications for the period of evaluation, which ranged from 1 to 3 months. The crown's fit was excellent in 8 cases. In two cases, minor adjustments were necessary – 1 in relation to the antagonists and 1 to the adjacent teeth. In one case, a healing screw was placed for 48 hours to facilitate adequate soft-tissue space for the Ti-base.

**Conclusion:** The preliminary results presented in this report suggest that the clinical and laboratory protocols used for guided implantation and immediate loading are highly efficient.

**Keywords:** implantation, loading, planning, protocol

**UDC Classification:** 616.31

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## **4 – NATURAL SCIENCES AND ICT**

## A SURVEY OF E-COMMERCE SECURITY THREATS AND SOLUTIONS

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**Abstract:** E-commerce security is part of the Web security problems that arise in all business information systems that operate over the Internet. However, in e-commerce security, the dimensions of web security – secrecy, integrity, and availability—are focused on protecting the consumer’s and e-store site’s assets from unauthorized access, use, alteration, or destruction. The paper presents an overview of the recent security issues in e-commerce applications and the usual points the attacker can target, such as the client (data, session, identity); the client computer; the network connection between the client and the webserver; the web server; third party software vendors. Discussed are effective approaches and tools used to address different e-commerce security threats. Special attention is paid to Cross-Site Scripting (XSS), Cross-Site Request Forgery (CSRF), phishing attacks, SQL injection, Man-in-the-middle, bots, denial-of-service, encryption, firewalls, SSL digital signatures, security certificates, PCI compliance. The research outlines and suggests many security solutions and best practices.

**UDC Classification:** 004.42

**Keywords:** e-Commerce, security, user experience.

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## DESIGN OF SPECIALIZED SURGICAL SCREW INSERTED IN PLATE TYPE CERVICAL IMPLANT

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**Abstract:** In the field of Implantology the screws are an important part because they transfer the loads that occur in the bones. Surgical screws are similar to those in Mechanical Engineering, but the materials should have specific characteristics like biocompatibility, strength, corrosion resistance and fatigue strength. The main function of the surgical screw is to create pressure between two bones which is necessary in order to heal the injured bones. The surgical screw transforms all forces of the movements to pressure and distributes the pressure on the bone's surfaces. Surgical screws can help in the setting of implants into an injured area. It also ensures static position of the injured bones. The research aims to analyse how the surgical screw type affects the bone of the patient with the help of the Finite Elements Method (FEM). Based on the results from the analysis of the surgical screw a new specialized surgical screw was designed with complex geometry to withstand the occurring loads and also be able to transfer them to the bone tissue. In additional, a comparison analysis between two different types of surgical screws was conducted. This paper shows how a surgical screw could be optimized in order to improve its function with the help of virtual tools. Finally, the materials used are biocompatible and often used for such screws and surgical implant analysis, the challenge was to recreate the bone tissue properties and to used them in the FEM analysis.

**UDC Classification:** 621.8

**Keywords:** cervical implant, FEM analysis, surgical screw, ANSYS analysis, implementation

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## **RAPID MATERIALIZATION OF A SMALL SERIES OF BONE STRUCTURE REPLICATIONS FROM A DIGITALIZED MODEL, CREATED BY COMPUTER TOMOGRAPHY**

**Todor Gavrilov<sup>1</sup>, Georgi Todorov<sup>2</sup>, Yavor Sofronov<sup>3</sup>**

**Abstract:** The recreation of bone structures from the human body has very complex geometry and a lack of symmetry. A small series of vertebrae replications, digitized by computed tomography, could serve in exercises for medical students to help them perform operational planning for inserting implant structures, cage type implants, or screws and rods implants. Additionally, these replications could be used in the planning of extraordinary clinical cases, for example complex vertebrae deformities. The replicated structure could be fulfilled in a 1:1 ratio or scaled. For the selection of an appropriate production technology a block diagram is followed which considers suitable technologies for the production of polymer parts, compared to the series size and the complexity of the geometry. Both criteria must be taken into account when considering which technology should be used in the production of polymer parts. Comparing the advantages and disadvantages of additive technologies and replication in silicone mold, the best choice for technology is set to be replication in silicone mold. The initial preparation for the manufacture of the silicone mold includes a detailed analysis of the geometry of the model for replication. The first step includes defining the runner place as well as mounting the runner to the model. To ensure the mold is completely filled while casting, positive-shaped vents in the mold are defined. Because of the complex shapes of the spinal vertebrae and the need to take out elements in many directions, the mold is divided into multiple parts. A block-diagram that summarizes the entire manufacturing cycle for replication in a silicone mold is developed.

**UDC Classification:** 621.7

**Keywords:** replication, silicone mold, spinal vertebrae, cage implant, operation planning

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## AN APPROACH FOR DEVELOPMENT AND APPLICATION OF CPSS- EDUCATIONAL ENVIRONMENTS IN BULGARIAN SCHOOL

Todorka Glushkova<sup>1</sup>, Veneta Tabakova-Komsalova<sup>2</sup>

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**Abstract:** Modern realities in the era of Industry 4.0 and the global Covid-19 pandemic place new challenges to education. It is a fact that classical learning, supported by modern information and communication technologies, provides an effective learning process, but the Covid-19 realities require a rapid transition to distance absentee learning. The use of computer-based training systems and cloud platforms has its advantages, but also problems related to the low level of personalization of the learning process and the adaptability of the learning content to the specific characteristics of each student.

Cyber-physical and social systems (CPSS) largely solve the problems associated with integrating processes and interactions in the virtual world with the dynamically changing conditions of the physical world in which learning occurs. This gives grounds to draw the attention of specialists to the creation of CPSS educational platforms for secondary school. Following this approach, we created a prototype of a CPSS educational space called BLISS. The results of the test application of this platform in the school environment give us reason to believe that if we put the learner with his/her peculiarities, goals, and interests at the center of such a system, and present him/her in the virtual space through his / her personal assistant, we could significantly increase the interactivity of the learning process and the adaptability of the offered learning content.

**UDC Classification:** 004.8

**Keywords:** eLearning, interaction, adaptation, CPSS (Cyber-Physical Social System)

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## STUDY OF THE DIGITIZATION LEVEL OF MANUFACTURING COMPANIES

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Štefan Mozol<sup>5</sup>, Marián Stárek<sup>6</sup>

**Abstract:** Today, advances in ICT are exponential in nature, and many technologies are now being added from which businesses can benefit from their application in their processes. Digitization is a wide area that already finds active application in businesses processes. It helps create new possibilities in terms of improving process performance, responding more quickly to changes, or helping to reduce costs for different production areas. In general, digitization in an enterprise can be understood as having specific financial as well as personnel requirements. There are few levels of digitalization that we can achieve (document digitalization, digital factory, virtual factory, and smart factory). The research goal of the article is a detailed description and comparison of the individual digitization levels and their tools. The article contains two case studies in which the analysis of processes in the form of questionnaires defines the appropriateness of the level of digitization. Also, based on the analysis, it is possible to say each of the levels of digitization has a particular area of application depending on the nature of production. The main findings of the case studies are that irrelevant digitization is costly and personally demanding without achieving more significant results without analysis. Companies' more efficient operation can be achieved even if the company does not use the latest technological advances and what simple changes need to be incorporated.

**UDC Classification:** 62-93

**Keywords:** digitalization, digital factory, virtual factory, smart factory, technologies, digitalization level, support tools

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## **STUDENTS 'OPINION OF A SELECTED EDUCATIONAL INSTITUTION ON THE USE OF TECHNOLOGICAL INNOVATION IN ORDINARY LIFE**

**Peter Jucha<sup>1</sup>, Tatiana Corejova<sup>2</sup>**

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**Abstract:** Technological progress is becoming more significant every year, and people are witnessing a number of innovations that are becoming part of their daily lives. The development of technology is advancing at great speed because the needs and requirements of people are becoming more and more difficult to meet, and so innovations are being developed to help fulfill these needs. However, not all people accept technological progress and innovation positively. The aim of the paper is to evaluate the opinion of people, specifically students of the selected higher education institution, on new technologies and innovations. In particular we wish to evaluate their general attitude towards technological innovation, but also their views on the use of specific technologies such as robots, drones or autonomous vehicles. Students' responses as to whether they would like them and whether they would be satisfied with the aforementioned innovations being widely used in the future vary. Some would benefit from the use of such innovations, others would not. Some students don't like it because people could lose their jobs and others don't really believe in such innovations. The results of the paper provide an evaluation of all the answers given by the students.

**UDC Classification:** 011

**Keywords:** autonomous vehicles, drones, innovations, technology, robots

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## A COMPARATIVE STUDY OF THE USABILITY OF DIFFERENT PRODUCTION SCHEDULING ALGORITHMS AND RULES

Pavol Jurík<sup>1</sup>

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**Abstract:** Production scheduling optimization is a very important part of a production process. There are production systems with one service object and systems with multiple service objects. When using several service objects, there are systems with service objects arranged in a parallel or in a serial manner. We also distinguish between systems such as flow shop, job shop, open shop and mixed shop. Throughout the history of production planning, a number of algorithms and rules have been developed to calculate optimal production plans. These algorithms and rules differ from each other in the possibilities and conditions of their application. Since there are too many possible algorithms and rules it is not easy to select the proper algorithm or rule for solving a specific scheduling problem. In this article we analyzed the usability of 33 different algorithms and rules in total. Each algorithm or rule is suitable for a specific type of problem. The result of our analysis is a set of comparison tables that can serve as a basis for making the right decision in the production process decision-making process in order to select the proper algorithm or rule for solving a specific problem. We believe that these tables can be used for a quick and easy selection of the proper algorithm or rule for solving some of the typical production scheduling problems.

**UDC Classification:** 519.8

**Keywords:** logistics, production scheduling, optimization algorithms, flow shop, job shop, open shop, mixed shop

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## STUDY OF THE CORRELATION BETWEEN THE CONTENT OF NANOOBJECTS AND SURFACE FEATURES

Natalia Kamanina<sup>1</sup>

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**Abstract:** It is well known that at the present time two basic aspects of a material's nano-objects sensitization should be considered. The first aspect relates to the change of the material's basic physical-chemical properties when the concentration of the nanoobjects in the material's body is varied. The second aspect is in regard to the modification of surface properties on the content of the nanoobjects in the material's body. In the current paper the correlation between the concentration of the nanoobjects and wetting phenomena of the material's surface is considered. Different experimental instruments and supporting models are presented with good coincidence.

**UDC Classification:** 532.783; 535.33; 539.6; 539.8; 538.95

**Keywords:** Organic materials, surface relief, sensitization, fullerenes and nanotubes content, polyvinyl alcohol, polyimide, wetting angle

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## A COMPARISON OF CREATING AN ANDROID APPLICATION USER INTERFACE IN XAML AND IN C# CODE

Igor Košťál<sup>1</sup>, Martin Mišút<sup>2</sup>

**Abstract:** Almost every Android user application has some kind of user interface. Android programmers who create Xamarin.Forms applications and who uses the Microsoft Visual Studio development environment to do so can create user interfaces in the XAML (the Extensible Application Markup Language) or in the C# programming language. This paper deals with a comparison of creating this user interface by the first and the second way. We demonstrate the differences in the creation of Android application user interfaces in XAML and in C# by way of using two of our Android applications which were created by the Microsoft Visual Studio 2019 Enterprise, which work as text editors with the ability to store text to disc, and have user interfaces that are visually identical. However, the user interface of the first Android application was created in XAML with a C# support code, whereas the user interface of the second Android application was created entirely in C#. While comparing the source codes of the user interfaces of both these Android applications, we identify the advantages and disadvantages of both approaches to creating a user interface and we try to find out which of these approaches is better for maintaining and modifying user interfaces. In this study, we also contrast the processes of handling events of controls of a user interface created in the XAML code for the first Android application as well as that of the same user interface created in the C# code for the second Android application. Furthermore, we were interested in determining whether the different ways of creating user interfaces affected the execution time of basic operations that included disc files that were performed on the same data by both the applications. We assume that it does not fundamentally affect the execution time, and so, we performed an experiment to confirm or refute our assumption.

**UDC Classification:** 004.42

**Keywords:** Android Xamarin.Forms application, user interface, XAML, C# code

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## MODEL-ORIENTED PROGRAMMING

Leonid Kruglov<sup>1</sup>, Yury Brodsky<sup>2</sup>

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**Abstract:** The problem of complex multi-component system processing arises in many fields of science and engineering. A system can be described in terms of its components, behavior, and interaction. This work proposes a new declarative Turing complete “model-oriented” programming paradigm based on the concept of “model-component” - a complex structure with well-defined characteristics and behavior, and no external methods. The set of model-components is closed under the union operation of model-components into “model-complex”. The proposed approach allows the program to describe the complex system and behavior of its components in a declarative way, possesses a higher level of encapsulation than the object-oriented paradigm, involves a reduced amount of imperative programming, and is naturally focused on parallel computations.

**UDC Classification:** 004.42

**Keywords:** model-oriented programming, complex systems, model synthesis, simulation.

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## THE EFFECT OF 3D TECHNOLOGIES IN STEREOMETRY TRAINING

Penio Lebamovski<sup>1</sup>

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**Abstract:** The software proposed in the report can be used as a technological tool in the teaching and learning of the discipline of stereometry. The aim is to improve the learning process by supporting the development of students' creativity and spatial imagination, qualities needed in the study of spatial geometric bodies. A new boundary method is used in the generation of geometric objects. This new method uses elements of the Cavalieri Indivisible method and Isaac Newton's boundary method, thus achieving higher accuracy with respect to generated objects compared to 3D systems that use the rules of trigonometry in the construction of geometric bodies. This article performs a comparative analysis between a traditional and a new method for generating 3D geometric objects according to certain parameters and criteria. The new method involved in the analysis was proposed by the author of the report. While the traditional one is based on trigonometry. Two parameters were studied, one for accuracy in generating objects, and the second determining speed. In order to generate cylindrical bodies, are used the quadratic Bézier curve and the 3D modeling technique known as an extrusion, which transforms two-dimensional objects into three-dimensional ones.. One way to generate a prism and pyramid is by extruding polygons. This report presents a new way of constructing edged bodies. The considered technique for 3D modeling participates in the analysis of the studied methods.

**UDC Classification:** 37.01

**Keywords:** boundary method, curve, extrusion, stereo system, stereometry, polygon, 3D printing

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## DATAFICATION AS A NECESSARY STEP IN THE PROCESSING OF BIG DATA IN DECISION-MAKING TASKS OF BUSINESS

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**Abstract:** The digital transformation of business in the light of opportunities and focusing on the challenges posed by the introduction of Big Data in enterprises allows for a more accurate reflection of the internal and external environmental stimuli. Intuition ceases to be present in the decision-making process, and decision-making becomes strictly data-based. Thus, the precondition for data-based decision-making is relevant data in digital form, resulting from data processing. Datafication is the process by which subjects, objects and procedures are transformed into digital data. Only after data collection can other natural steps occur to acquire knowledge to improve the company's results if we move in the industry's functioning context. The task of finding a set of attributes (selecting attributes from a set of available attributes) so that a suitable alternative can be determined in its decision-making is analogous to the task of classification. Decision trees are suitable for solving such a task. We verified the proposed method in the case of logistics tasks. The analysis subject was tasks from logistics and 80 well-described quantitative methods used in logistics to solve them. The result of the analysis is a matrix (table), in which the rows contain the values of individual attributes defining a specific logistic task. The columns contain the values of the given attribute for different tasks. We used Incremental Wrapper Subset Selection IWSS package Weka 3.8.4 to select attributes. The resulting classification model is suitable for use in DSS. The analysis of logistics tasks and the subsequent design of a classification model made it possible to reveal the contours of the relationship between the characteristics of a logistics problem explicitly expressed through a set of attributes and the classes of methods used to solve them.

**UDC Classification:** 004.62

**Keywords:** datafication, logistics, classification, DSS, big data.

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## INTERACTIVE METHODS OF TRAINING IN SUSTAINABLE WASTE MANAGEMENT

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**Abstract:** Environmental education addresses the most common and current environmental problems as they could lead to a serious ecological misbalance on Earth. One of them is associated with a huge amount of waste, the need for sustainable management and recovery. For this reason, the topic of sustainable waste management needs to be included in the process of environmental education, to be based on an interdisciplinary approach, to start from an early age and be embedded not only in school curricula but also in extra-curricular activities, to be conducted systematically and methodologically provided.

This paper presents an interactive model for training in sustainable waste management through an activity approach that could be successfully applied in some extra-curricular activities. Didactic instruments have been developed in the course of a project funded by the University of Plovdiv, aiming to enhance the ecological competencies of both pupils (11-13 years' age) and students (pre-teachers in Biology). The thematic content included four themes: Waste definition and classification, Waste treatment, the Recycling process, and the Composting process. Learning activities and the expected results of the training are defined for each theme. The innovative model of training in sustainable waste management includes four of the most popular interactive educational methods: research-based education, problem-based education, game-based education, and project learning. Worksheets have been developed for all activities, and the thematic content was structured following environmental topics, enabling environmental education through a proactive approach. In order to assess the effectiveness of the interactive methodology, two questionnaires (pre-test and post-test) were developed. Each one consisted of 15 questions allowing the analysis of the environmental competencies of pupils (knowledge, attitude and behavior construct), as well as the attitudes, habits and behavior of both children and their families to the problem of sustainable waste management. The first questionnaire was made before the training in order to determine the entry-level of knowledge and competencies, while the second one was conducted after the training in order to evaluate the competencies' enhancement.

The experimental trainings conducted (2019-2020) show that these models for training in sustainable waste management, based on the constructivist approach, lead to a significant increase of pro-ecological behavior and can be successfully implemented in the education process. According to the knowledge construct, we found that the working hypothesis was confirmed for 80.2% of the pupils ( $\chi^2 = 2.043$ ,  $p < 0.05$ ). Based on the attitude construct, we found that the working hypothesis was confirmed for 46.7% of the pupils ( $\chi^2 = 1.205$ ,  $p < 0.05$ ). In the behavior construct, the working hypothesis was confirmed for almost 23% of the pupils who had not had long-term habits for nature conservation and rational use of resources before the time of training ( $\chi^2 = 0.383$ ,  $p < 0.05$ ). This was the construct with the lowest positive change from the three studied.

**UDC Classification:** 37.04

**Keywords:** sustainable development, recycle-reuse-reduce, separate waste collection, pro-ecological behavior.

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## **BIG DATA AND DECISION-MAKING SUPPORT**

**Peter Procházka<sup>1</sup>**

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**Abstract:**

**INTRODUCTION:** Nowadays, Big Data is created in previously unimaginable quantities. Newly generated data from various Internet of Things (IoT) sensors and their use have never reached their current dimensions. Along with this trend, the availability of devices capable of collecting this data increases, the time for their evaluation is reduced and the volume of data collected at the same time increases. The most important task of research and development in this area is to bring solutions suitable for processing large amounts of data because our current storage and processing capabilities are limited and unable to compete with the storage, processing and publication of the resulting data.

**OBJECTIVES:** Point out the importance of implementing Big Data technology.

**METHODS:** To achieve the goal, the following methodological approach was chosen: study and processing of foreign and domestic literature, acquaintance with similar solutions for data processing, definition of Big Data and IoT, proposal for using Big Data solution to support decision-making, risk definition and evaluation.

**RESULTS:** With the growing amount of disparate and incoherent data and the further growth of the Internet of Things, it is now almost impossible to evaluate all available information correctly and in a timely manner. Without this knowledge, the company loses its competitive advantage and is unable to respond in a timely manner to client requests.

**CONCLUSION:** Implementing a solution for processing Big Data to support decision-making in the company is a complex process. As part of the implementation and use of the Big Data solution to support decision-making, the company must be prepared for the emergence of various problems. We can assume that Big Data technology will constantly be evolving in terms of streamlining analytical tools for obtaining information from large volumes of generated data. Therefore, it is appropriate to create space for the implementation of Big Data technology.

**UDC Classification:** 004.6

**Keywords:** Big, Data, IoT.

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## LINGUISTIC SUMMARIES IN EVALUATING ELEMENTARY CONDITIONS AND THEIR APPLICATION IN SOFTWARE ENVIRONMENT

Pavol Sojka<sup>1</sup>

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**Abstract:** Data users are generally interested in two types of aggregated information: summarization of the selected attribute(s) for all considered entities and retrieval and evaluation of entities by the requirements posed on the relevant attributes. Less statistically literate users (e.g., domain experts) and the business intelligence strategic dashboards can benefit from linguistic summarization, i.e. a summary like most customers are middle-aged can be understood immediately. Evaluation of the mandatory and optional requirements of the structure P1 and most of the other posed predicates should be satisfied beneficial for analytical business intelligence dashboards and search engines in general. This work formalizes the integration of the aforementioned quantified summaries and quantified evaluation into the concept of database queries to empower their flexibility by, e.g., the nested quantified query conditions on hierarchical data structures. Later in our work, we adapted our research into practical application. We created a software environment for evaluating data based on a dataset retrieved from The Statistical Office of the Slovak republic. These datasets are aimed mainly on landscape characteristics like altitude, area sizes of towns and villages, and similar parameters. Based on user's preferences, our system recommends the most suitable place for holidays to spend on.

**UDC Classification:** 519.6

**Keywords:** fuzzy logic, linguistic summaries, degree of membership, computational intelligence, web application, databases

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## VERIFICATION OF TACTICAL AND TECHNICAL DATA OF THE BREATHING APPARATUS

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**Abstract:** The function of the breathing apparatus is to protect the health of firefighters in a harmful and non-respirable environment. Closed-circuit breathing apparatus provides members of the Fire and Rescue Service with respiratory protection in the elimination of adverse events in tunnels and underground spaces. The MSA 4h Air Elite is a four-hour self-contained breathing apparatus that operates on the principle of generating oxygen by an exothermic reaction of potassium hyperoxide. Each breathing apparatus has its tactical technical parameters. We verified the tactical and technical data of the MSA AIRE ELITE by the experiment they participated in the firefighter. Each firefighter was equally coupled. An MSA Air Elite was used during the experiment. Tactical-technical data reported by the manufacturer varies in some points with the practical results that we have managed to obtain. The manufacturer's largest deviations in tactical and technical data and practical results are mainly in the length of work activity, temperature in use in intervention, and air consumption. According to our experiment, the MSA 4h Air Elite breathing apparatus does not last in the working activity 240 minutes as it discloses a manufacturer, but on the other hand, this time-inconsistency may be caused by the intensity of training and demanding of the training track.

**UDC Classification:** 351

**Keywords:** breathing apparatus, closed-circuit, firefighting

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