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Smart Energy Systems: An Innovative Approach for Sustainable Energy Supply

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ABSTRACT

As a result of climate change, almost the entire world is focused on generating energy from renewable sources. One of the main challenges is how to ensure sustainable energy development, by knowing the fact that, the energywhich comes from renewable sources is directly dependent on climatic conditions. One of the most promising solutions for energy sustainability is a smart energy system.

This study aims to provide an innovative approach to ensure a sustainable energy supply, a case which can then be implemented in our country.The main purpose of this paper is to show the importanceof implementation of Smart Energy System projects, and to analyze current technologies, the transformational solutions of the current traditional system into a smart system, and to enhance their energetic and environmental performance to ensure sustainability. Also, a translation will be given of how these systems work, what are the advantages and challenges. A smart energy system is a 100% renewable energy system, it is cost-effective and does not increase the cost of energy compared to traditional sources. These systems use technologies and resources that are clean, reliable and affordable which are evaluated based on environmental performance.

Keywords: renewable energy, sustainable energy, smart energy system, sustainable supply

The interface between Trademarks and Geographical Indication: Could the CJEU solve the long-standing issue?

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Abstract:

Intellectual Property represents the creation that derives from the human intellect being materialized as an idea, expression, or device. As such, it is rapidly becoming one of the most innovative fields that is being given a particular interest. Apart from the Intellectual Property Rights which date to earlier times and are considered as the traditional IPRs including Trademarks, Copyrights, and Patents, there are also newer IPRs that have been developed more recently but still secured an important spot. A special emphasis in this latter category should be pointed to the Geographical Indications. However, a very complex, conflicting and intenserelationship between Trademarks and Geographical Indications has traditionally developed throughout history due to many similarities the two share. By utilising mixed methods of qualitative and quantitative methods, this paper will mainly focus on the conflict between Trademarks and GIs in the European Union level concerning the refusal of trademarks registration that consist of geographical names and defining the criteria for acquiring a distinctive character by the mark. The key aspect of the paper will be to analyse the role and impact of the Court of Justice of the EU on solving this apparent issue.

Keywords—*Intellectual Property, Trademarks, Geographical Indications, CJEU*

Development of a sustainable urban mobility plan for the city center of Bitola

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Abstract

A Sustainable Urban Mobility Plan (SUMP) is a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation and evaluation principles. The development of the Sustainable Urban Mobility Plan (SUMP) is a reflection of the changes in the current practice of traffic planning, in which only experts in the field of traffic planning participated, in the process involving various experts from different fields, associations, institutions, citizens, etc. SUMP contributes to achieving balance of social equity, environmental quality and economic development. It represents a new approach to traffic planning and does not replace, but complements and builds on the existing strategic documents of the city. Consequently, in the process of traffic and urban development, walking, cycling, public transport should be put into the first place, and then the use of private cars in a sustainable way. Achieving the sustainable cities is also focused on the protection of the environment in order to provide a higher quality of life for the population. Therefore, it is considered that by improving the urban transportation planning additional benefits could be provided for both the environment and the sustainable development of the cities. This paper is focused of developing sustainable urban mobility plan in center of city Bitola for safe urban space. In order to protect pedestrian and bicycle traffic, two variant of traffic solutions are envisaged, which envisage closing part of the streets for traffic, connection with a pedestrian street which result with continuous pedestrian street, introduction of a zone of calm traffic, application of a "contra-flow" bicycle lane on streets with one-way traffic regime and "Zone 30".

Keywords*—sustainable urban mobility, traffic, planning*

MEASURING IT SECTOR INNOVATIONS CAPABILITIES THROUGH COMPANY INNOVATIVE LEADERSHIP MODEL

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Abstract:

This paper aims at presenting the results from a research on the innovative leadership at company level for ICT companies in the Republic of North Macedonia. The research employed Company Innovative Leadership Model (CILM). The paper intends to bring light to three groups of innovation capabilities indicators, Innovation competences, Innovation potential and capabilities and Innovation activity. The Company Innovative Leadership Model evaluate the innovations implemented in companies (past), current innovation activities (present) companies' capabilities for future innovation development (prospect).

25 ICT companies from Republic of North Macedonia, 25 from Kosovo and 40 from Bulgaria took part in the research. The main contribution of the research is that evidences from the research create a benchmark for the Republic of North Macedonia ICT companies' innovative leadership capacities. As a conclusion, ICT companies are in the process of expansion toward innovation capabilities.

Keywords: Republic of North Macedonia; innovation; ICT; innovative enterprises. Innovative capabilities.

CHANGES IN MACEDONIAN, KOSOVO AND ALBANIAN MONETARY POLICY

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ABSTRACT

In this paper we will make detailed analysis of the permanent instrumentation available to the National bank of the Republic of North Macedonia, bank of Albania and Central bank of Kosovo in performing their tasks and how they use these instruments to achieve the set goals and to deal with the negative effects of the crisis.

Will be analyzed anti-crisis measures which were taken in the Republic of North Macedonia during the global economic crisis by both: the Government and the National bank of the Republic of North Macedonia, in order to reduce the negative effect of the global economic crisis and to minimize the consequence of the crisis on the economy of the country as well as the Bank of Albania and Central bank of Kosovo.

Towards the end of the last century and the beginning of this century, economics considered that there was no serious danger of major economic fluctuations, that the economic cycle was "dead" and that the instrumentation of economic policy could successfully deal with any challenge. But, the emergence of the financial crisis at the end of 2007 and beginning of 2008 showed us the fragility of the banking system and the macroeconomic consequences resulting from the instability in the banking and financial system in general. The global economic crisis has led to a re-focus on the design of key macroeconomic policies – their interactions, as well as their effectiveness / effects on other macroeconomic variables.

The emergence of the global crisis has led to more substantive discussions on the basic postulates of monetary policy and again in the focus of the Central banks in addition to price stability returned the stability of the financial system as a condition for a stable economy. Finally, we will analyze the changes in the part of the supervision of the banks operations during the analyzed period, why these changes were undertaken and what there their effects on the banks operations and the bank system I global.

Key word: Central bank, banking system, global crisis, macroeconomic policies.

The impact of Covid 19 on North Macedonian economy and government responses

Blerta Kondri

Bukurije Imeri-Jusufi

North Macedonia has been under lockdown since 18 March due to the Covid-19 outbreak. An initial state of emergency was declared on 18 March for the entire territory of North Macedonia, and it was later extended.Since the first recorded case of the coronavirus in February, the number of cases in North Macedonia hasraisedcontinually.In view of the current situation a three-phase plan for the reduction of virus prevention measures was adopted by the Macedonian government. Measures to prevent the spread of Covid-19 have slowed economic activity, which in turn has begun to negatively impact the national budget. The aim of this study is to analyze how much this pandemic situation has affected the main economic sectors and main macroeconomic indicators in North Macedonian economy.In order to analyze changes in this indicators are used empirical methods.This methods findings indicate that Covid 19 crisis has negatives impact on the main macroeconomic indicators in North Macedonia.

Key words: Covid 19 crisis, government response, economic sectors, macroeconomic indicators,

The four key factors that determine the success of a family business.

Bedri Ademi, Mother Teresa University Skopje
XhenanaAzizi, FAMAColege, Prishtinë

ABSTRACT
Profit is not the onlyobjective of an existing business; therefore it may not be the only and the adequate indicator to determine the success of a business. The success of a business organization is followed by many other factors. The family business (FB) of course has profit as its first objective, but it exists for other reasons as well. It is not easy at all to define but also to determine the relevant factors to FB success, especially when even today there is no unification in the definition of FB. From current research it can be concluded that there are four relevant factors that determine the success of FB. Favoring the offspring; Financing strategic development from the family budget; Flexibility to change as well as Formalize relationships are the factors which are grouped as 4F.
The main purpose of this paper is to identify how much these factors affect FB success and their weight. However, the first challenge we encounter during research is how to define FB and then its success. Given the complexity of FB, based on the research of many authors, FBwill be successful only if these two entities (family and business) are separately successful.
The main hypothesis of this paper is that 4Fs have a positive correlation with FB success. The research is conducted in RNM companies that are declared as FB, therefore the results are unlikely to be generalized. To measure the identified variables, research instruments have been designed to help validate the general and specific hypotheses related to the success of FB.
This paper also suggests that the field of FB management has scope to research that this form of business can be also successful.

Keywords: Family business, Success of business, Heir, Formalization

OPERATIONAL PERFORMANCE EVALUATION OF PROTECTED INTERSECTION DESIGN IN MICROSIMULATION ENVIRONMENT

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ABSTRACT

Making cities integrated and sustainable is extremely challenging. Relocating of road space to sustainable modes of transport, encouraging street activities and promoting active travel such as cycling and walking, are one of the most efficient policies that can help cities to become more livable and sustainable. Planning of the road the road intersection space in integrated manner is one of the principles of the sustainable urban mobility planning. Protected intersections are one of the novel infrastructure designs that incorporate safety features related to active road users, such as: physically separating, improving pedestrians' and bicyclists' visibility to drivers, providing shorter crossing distances for active road users, and prioritizing active modes through signalization. These intersection treatments are not yet fully applied in the Macedonian cities. In this paper, the operational performances of the protected intersection will be performed. The main research objective of this paper is to identify whether or not the protected intersection design performs better than the conventional signalized intersection in the City of Skopje context. Therefore, the protected intersection design will be modeled and simulated in microsimulation environment, and results will be analyzed and compared with the operational performances of the existing intersection design.

KEYWORDS

Protected intersection, Operational performance, Evaluation, Microsimulation.

Green bonds and assurance process: first propositions about the role of accounting providers

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Extended abstract

Purpose

Green bonds are becoming a key pillar of Green Finance. Through a periodization of the green bonds market we intend to stress how accounting providers participate and seek to establish a particular market segment. Many perplexities are linked to this on the actual effectiveness of these investments to ensure the improvement of the environment and climate and on the actual ethics and transparency of management of the various phases of issue and auditing / assurance of the same.

Research Design

Research design includes literature analysis on the specific issuance of green bonds by EU an the perplexities have prompted the curiosity of the wishes of the paper which aim to respond to the following research question: "How auditors participate and seek to establish the particular market segment of green bonds?" Moreoverresearch design isconsideringdeductive and inductiveapproach.

Research implications and originality

The originality of the paper isabout the contribution of accounting providers to the assuranceprocess. The paper focus on the analysis of pre-requisites: independence of auditor, the typology of information to be audited, the quality of stardardsat the base of the evalutation. Thispre-requisites are connected to the attributes, that are: integrity, transparency and efficiency of green bond market. The pre-requisite of assurance and auditing in the second period are consideredveryimportant and theirimplementation, all over the world, are influencing trust and the survive of the Green Bond market. About theirimplementation and the role of auditors concerning: integrity ,trasparency and efficiencyisveryimportant, becausethere are standards and the approach follows the structuring of audits for financialstatements, with ratherdetailed steps to arriveat an assessment of the reliability of the non-financial report tooatdifferent stages of green bonds process of issuing. But some perplexities remain about the quality of evaluation, especially about independency considering that there are may different actors that are offering these services and often they are the "big four" with assignments that are involving both financial and not-financial reporting verification and certification. This may create commitment between the assurance provider/auditor and the ouditee, with perspective danger to independence, efficiency and transparency of the Green Bond market.

Student Data and GDPR: Practical implications for higher education institutions in North Macedonia

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ABSTRACT

Entered into force in May 2018, the General Data Protection Regulation (GDPR) is the latest regulation in EU law on privacy and data protection designed to control the way in which organisationscollect, process andstore personal data.Spanning over 99 comprehensive articles, this document imposes robust data privacy and security standards and requirements not only within the EU but also onto allpublic or private entities, including higher education institutions (HEIs), that handle data related to people in the EU. In an increasingly globalised world marked by people's mobility, it is only understandable that there has been a perceptible convergence trend that has seen a number of non-EU countries adapt their national legislation to align more closely with GDPR standards. Such has also been the case with North Macedonia, whose latest Law on Personal Data Protection (LPDP), passed in the early months of 2020, stemmed in part from efforts to harmonise domestic legislation with EU legislation in the context of the country's EU accession aspirations.

This paper aims to make a comparative examination of those articles in the GDPR and the current Law on Personal Data Protection that relate to the provisions thatcompliant HEIs in North Macedonia need to instate in handlingstudent data. It discusses the general situation at present regarding the collection, use, storing and sharing student data and proposes a set of measures for Macedonian HEIs to implement to ensure greater data security and GDPR compliance.

Key words: *GDPR, data protection, higher education, HEI, student data, non-EU countries*

THE HARMONIZED EUROPEAN VALUE ADDED TAX SYSTEM

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ABSTRACT

This paper aims to provide an overview of developments in indirect tax harmonization within the European Union (EU).

The process of tax harmonization in the EU is part of global trends, namely tax adjustment, cooperation, coordination and harmonization of taxes against competition.

This paper focuses on EU legislation and practices on VAT issues, it describes the origin and spread of VAT application, the principles and purpose of VAT, the 6th VAT Directive and the concept of harmonization of VAT and national tax systems of aspiring states as a precondition for European integration.

The basic aim of the EU states was to create a common European market that would guarantee the free movement of goods, services, individuals and capital, known as the four fundamental freedoms of the single European market.

The research methodology, which will be used in this paper is quantitative analysis. Some of the methods that will be used during this paper are: descriptive method, synthesis method and comparative method.

In general, the paper will address the question of what fiscal harmonization actually is and what the consequences may be of a competitive situation for member states.

Following a brief overview of fiscal policy within the EU, the diversity of fiscal systems among member states will be highlighted and future perspectives will be outlined.

The paper illustrates that through partial harmonization of indirect taxes (value-added tax and excise duties) the EU has reached a considerable degree of fiscal neutrality.

The paper provides a summary of the progress of tax harmonization in the EU.

KEY WORDS

harmonization, VAT, European integrations, single European market

Sustainable transport through contribution of different passenger vehicles

Stevan Kjosevski, Atanas Kochov, Aleksandar Kostikj

Abstract

Sustainable transport is one of core parts of sustainable development according to UN strategy. In the area of Western Balkan countries there are a number of specifics and similarities in that light. Relying mostly on road transport, fighting with limited capacities and facing serious challenges related to contemporary traffic means, professionals in this region need to try to contribute to the development of sustainable transport. As a part of wider research by using scientific approach, a number of indicators have been identified and structured in different levels. On a basic level five indicators have been identified: Economic, Social, Environmental, Good governance and planning and Cultural. On other hand, in the context of their capacity to contribute to sustainable transport, five transport means have been taken into consideration: Electric, Plug-in Hybrid, Alternative Fuelled, Gasoline Fuelled and Diesel Fuelled vehicles. By using AHP method, a total of 73 experts from Western Balkan region have been asked to express their view on the capacity of different alternatives of vehicles to contribute to the sustainable transport. This paper shows the results of the research performed and offers a possibility to analyse a number of specific aspects in this area. The results are grouped by the country and profession of the interviewed professionals. The results could be used for policy making, or decision taking on different levels.

Business orientation of the non-alcoholic beverages manufacturers' and sustainable development goals

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Abstract

As firms throughout the globe embrace a joint responsibility towards sustainable development goals, a refined concept of doing business is beginning to surface by demanding businessesto operate environmentally friendly. The objective of this paper is to understand the nonalcoholic beverages manufacturers' current business orientation by addressing the factors that hinder the sustainable development goals. The research considered application of the qualitative methodology. The findings shed light on the extent to which those businesses can afford to invest on clean technology and renewable energy. In the context of sustainable development goals, the paper further examines the opportunities and threats the firms will encounter in the marketplace, such as consumer's demand for sustainable products and services.

Keywords: sustainable development goals, business model

The role of planning, as well as the impact and competitive position on the success and development of contemporary enterprises

Igballe Selmani - Mother Teresa University

In this study l propose a model of an exploratory part of the interconnectedness of the literature, case study theories regarding the identification of the competitive position in comparison with competitor's level where we examine through the Perceptual Map of consumers figure. In addition, as a case study we illustrate how many enterprises in RNM take into consideration the competitive advantage factor. However, emphasizing the importance of planning and competitive positioning in the success of the enterprise.

We employed multiple methods: research methods with literature used from the Internet; systematic approach method, analysis method, statistical method, survey method and descriptive method. The purpose of the research is to emphasize the importance and influence that planning has on the success of the enterprise. This study investigates the importance of a competitive position by analyzing the factors of the industry, considering the entry and exit barriers that are in favor or disadvantage of the enterprise.

The paper is motivated by some research questions, one of them is: How much is the advantage of differentiation applied in the enterprise? The questions are formed on the basis of the hierarchy of competitive advantage forces that companies should consider. In other words, what we understand from enterprise managers that most companies in RNM apply some competitive advantages to achieve high success performance but each one has chosen a certain number to achieve high competitive advantage. Further, more systematic and theoretical analysis is required for another research. The products we explore are mobile phones, and we have compared the ideal segment B with key competitors such as Huawei, HTC, Samsung G, Nokia. For instance, the ideal B-segment handset is almost equal away from Huawei, HTC, Nokia, and Samsung Galaxy. All things considered, these four competitors are likely to be chosen by consumers in segment B.

Keywords: Planning, communication, competitive position, competitive advantage, enterprises.

Analyses Of Pollution And Devising Pollution PreventionStrategy using Software Solutions

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Abstract

The purpose of the research study is analyses and preventing pollution that is a compelling strategy for many reasons.The huge dependence on ecosystem management services resulting in depletion of natural resources and biodiversity is one of the major challenges in efforts to mitigate and adapt to climate change and improve the quality of life. The research aims to approach the analysis of the possibilities for reducing pollution as well as its reporting by the citizens themselves. Raising public awareness among citizens and encouraging a sense of responsibility in the protection and promotion of the environment, by animating the young population in taking measures to prevent or reduce environmental pollution. The expected findings and arguments of the work provides sufficient information on sources of pollution and how to address them especially by firstly focusing on increasing the awareness to these factor and damages that pollution is causing to health in general.For the realization of the research, development of asoftware portal is envisaged.The research methodology used is triangulation technique which combines qualitative and quantitative methodology. As research method used questionnaire and focus groups.

Keywords*—ecology,pollution prevention, biodiversity, information system, rising public awareness*

The impact of composite materials on energy efficiency in automotive industry

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Abstract

Being classified as one of the most polluting industries, the automotive industry is undergoing under fast changes in order to transform and become more energy efficient and as a result, more sustainable. Engineers and researchers all over the globe are working hard to create new innovative ways so that cars spend less energy while working the same. The logical first step for improving was constructive materials and one of the materials that showed the biggest potential was undoubtedly composite materials. There are many characteristics that composite materials offer such as relatively high strength and low weight, great corrosion resistance, thermal properties and dimensional stability as well as high resistance to impact, fatigue and other types of loads. The research has developed in many paths such as using existing composite materials to improve energy efficiency, improving existing materials by adding new elements and phases as well as creating new composite materials. This paper compares this three main research tracks through analyzing their impact on energy efficiency and sustainability as well as weighing their benefits and losses.

Keywords*—energy efficiency, sustainability, cars, composite materials*

The hybrid system of combination of hydro plant and floating PV systems in the artificial lakes of North Macedonia

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Abstract

The energy sector in North Macedonia has several problems such as the high prevalence of lignite in electricity generation, high energy dependency, inefficiency in energy generation/use and poor condition of the energy system. According to the Macedonian energy strategy the planned share of renewable energy source (RES) in the electricity generation in 2030 is 30%. There have been several researches where different scenarios have been investigated. The scenario, the 50% renewable energy system, has been created for the year 2030 where special attention is given to the intermittent RES and to the storage technologies. In this study the installation of floating solar PV on the surface of artificial lakes of hydro plants in North Macedonia is analyzed. Such technologies are still at an early stage but many projects are being developed across the world. A particular example of Tikves hydro plant is taken which has an installed capacity of 113MW and the surface area of the lake is 14 km2. By making use of the PVsyst, it is observed that installation of PV in an area of 78000m2 a 9.524 MWp capacity is obtained. This shows that a new generation capacity may be achieved by utilization of the existing transmission system.

Keywords*—floating solar PV, renewable energy, greenhouse gas, artificial lakes, generation capacity*

Application of arithmetic progression in economics using "Wolfram Mathematica" software

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Abstract

If the difference between two successive members of a sequence is a constant number, that progression is called "arithmetic progression". Arithmetic progressions explain how the terms follow each other sequentially. When there is a constant difference between successive terms, the progression is said to be arithmetic. In an arithmetic sequence, terms can be obtained by adding or subtracting a constant from a previous expression. In this paper will be given the main formulas related to arithmetic progression as well as arithmetic series. Appropriate codes will also be provided for solving problems from arithmetic progression through the Wolfram Mathematics application software. Various problems in the field of economics related to arithmetic progression will be solved analytically and then compared with the solutions obtained through Mathematica software.

Keywords- *arithmetic progression, Wolfram Mathematica*.

Assessment of Psychological and Psychophysiological risks in a Waste Management Company in North Macedonia – A Case study

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Abstract

Exposure to work related psychological and psychophysiological hazards may have negative impact on workers' and companies health. The purpose of this paper is to provide the risk assessment overview of workplaces' psychological and psychophysiological hazards in thewaste management companyin North Macedonia with 10 different workplaces. The occupational safety and health risk assessmentwas carried out by an authorized institution using a licensed software package LatiPRO. The following psychological and psychophysiological hazards were identified and assessed: psychological pressures (stress and monotony), work intensity, and hazards related to work organization (extended working time - overtime, shift work, night work). Risk was categorized as negligible (0÷5), low risk (6÷50), moderate risk (51÷250), high risk (251÷500) and unacceptable risk (> 500).It was found that in workplaces such as welder, truck driver, special vehicles driver for garbage transportation, and sewer installation maintenance worker and autoclave treatment operator of medical waste the risk was high (400). Whereas, the workplace guard was found to have high risk related to shift and night work. The workplace administrative worker was categorized as a low-risk workplace (40).It was concluded that most of the employees at the waste management service company were highly likely to be exposed to psychological and psychophysiological hazards. Hence, reduction/elimination and control of higher and moderate risk hazards was recommended.

Keywords: risk assessment, psychological and psychophysiological hazards, waste management

Identification of Occupational Hazards in Contemporary Working Environment

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Abstract

The purpose of the research in this study is to analyze the impact of early prediction of hazards to prevent workplace injuries and improve employee safety. The tremendous advances in technology in recent decades have created new hazards in machine handling, which has led to the development of new techniques for a higher degree of protection that society expects from employers to provide to their employees. The analyses show that regardless of the type of method used for risk assessment, the highest risks for machine operators are generated by mechanical hazards. This research aims to approach the analysis of risks caused by mechanical hazards and propose measures to prevent them before they occur. A risk assessment for a mechanic was made and all factors that generate a high level of risk were analyzed. The methodology used for risk assessment is a tabular technique that combines qualitative and quantitative methodology. The Kinney method was used as the research method. Raising awareness of occupational safety among employers and encouraging a sense of responsibility for workers' health will be a major benefit that will provide better working conditions in any business, both human and economically.

Keywords— *workplace safety, mechanical hazards, risk assessment*

Contribution of 6GMobile Networks with Artificial Intelligence for Sustainable Development

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Abstract

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015 refers to 17 Sustainable Development Goals in almost every aspects of life which would further bring peace and prosperity for people and planet. Although most of these goals seem very ambitious the rapid advancements of mobile networks may play a major role in fulfilling these sustainable development goals. As 5G mobile network already begins to be commercially available, the main research and development activities focus on the next 6th generation of mobile networks, also known as 6G, which is expected to be commercially available around 2030. Machine Learning andgenerally Artificial Intelligence (AI) are becoming necessity forfurther expansion of the beyond 5G mobile world. AI-assistedIoT services, data collection, analytics and storage should benative in 6G networks. Terahertz,visible light communication and technologies like compressedsensing theory, new channel coding, large-scale antenna, flexiblespectrum usage, AI-based wireless communication and specialfeatures as Space-Air-Ground-Sea integrated communicationand wireless tactile network are few of the novelties that areexpected to become a common network standard of 6G.This paper gives an overview of the areas in which 6G network would contribute to achieve the UN 2030 sustainable development goals, as well as, a potential architectural design of 6G network which would bring such sustainable development.

Keywords*—5G, 6G, mobile networks, mobile technologies*

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Abstract

Environmental management system or Eco management means that environment have to eliminate negative influence to health function and environment. On another hand the protection environment must not limit economic and socio development. Environmental management system represents a basic strategic activity that defines planning principles and criteria of protection, maintenance and development of the environment. The environmental management has to run through four long-term and mutually interacted processes: economy restructuring, environment pollution reduction, spatial planning and rational use of natural resources.Strategic eco-management planning has the necessary integrative potentials for managing changes in space, a long-term time horizon and a catalyst position for harmonizing public, social and private interests. The concept of ecologically sustainable socio-economic development becomes in modern conditions the cornerstone of development planning, achieving an impact on all spheres of human activity.However, the path to sustainability is a complex and time-consuming process, because it requires a change in the opinion and behavior of all social factors, i.e. acceptance of the view that the environmental impact of development is as important as the economic one. The planning process is expressed in extremely complex activities, which can leave long-term consequences on a large number of people. It is extremely important to study the consequences and warn the factors that cause them, so that the positive effects of the factors will be encouraged and the negative effect will be prevented or the aspect of manifestation will be known.

Keywords*—management, environment, sub staindevelopment, ecomanagement*

NUMERICAL ANALYSIS ON FIRE RESISTANCE OF RC BEAMS WITH DIFFERENT CROSS SECTION WIDTH

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ABSTRACT

A parametric analysis of two span continuous reinforced concrete beam exposed to standard ISO 834 fire curve is presented in this paper. The influence of the cross section dimensions on the fire resistance of the beam exposed to fire only from three sides is analyzed.

The analysis of the reinforced concrete beam is conducted by using the computer progam FIRE which consists of two modules. The module FIRE-T defines the non-linear and non-stationary temperature field in the cross section of the fire exposed elements, while the structural responseto the high temperatures is defined with the FIRE-S module. Temperature dependent mechanical and thermal properties of the constructive materials(concreteand steel) aretaken according to the recommendations given in Eurocode 2, part 1.2.

The analysis has shown that the width of the cross section has positive effect on the fire resistance of the analyzed RC beam. Due to the wider cross section the temperature penetration is slower. The concrete temperature in the middle of the section and the reinforcement temperature are slightly lower, consequently a higher fire resistance is achieved.

Based on the results of the conducted analysis the behavior of the reinforced concrete beam exposed to fire has been defined and recommendations for increasing the fire resistance are given.

Keywords:*Continuous RC beam; Standard fire curve; Thermal analysis; Fire resistance*.

Sustainable Bioclimatic Strategies Applicable on Buildings on Sloped Terrain in Mountain Touristic Settlements

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ABSTRACT

This research analyses certain bioclimatic sustainable strategies that are in correlation with the thermal, visual and spatial comfort of a touristic complex in the tourist settlement Popova Shapka on the Shar Mountain. More precisely, this research discusses about the possible ways of application of the analyzed bioclimatic sustainable strategies for achieving sustainable solutions regarding urban planning, design of a buildings on a sloped terrain, developing sustainable constructive solutions of the buildings and revitalization of the existing tourist settlement.

This study was conducted in the following steps. At first, the sustainable bioclimatic discourse was analyzed in order to give explanation which of the mentioned sustainable principles can be applied on the analyzed case. Then, different analytical methods and information from various scientific areas were used, which helped in detecting the real problems present on the analyzed location. The results of the conducted analysis enlighten the possible ways of revitalization of the touristic settlement through defining the functions that are missing. Incorporating new functions in the existing settlement is believed to be a solution for attracting more visitors during all year around, improving the social cohesion, creating ecologically designed complex that will give the visitors more possibilities of enjoying the beautiful nature. The possible ways of applying the best constructive solutions of the buildings were analyzed as well. It was concluded that the bioclimatic approach in this field should incorporate active and passive strategies of solar architecture, ecological and natural materials and systems with good energy efficient performances.

Having in mind that this location is situated in sloped terrain the bioclimatic strategies recognized in this research as applicable can assist on finding better, healthier, more sustainable, eco-friendly and people-friendly solutions. These strategies and measures can also be applied in wider urban context in other mountain touristic settlements with similar environmental problems.

KEYWORDS: Sustainable strategies, Bioclimatic architecture, Environmental urban planning, Solar architecture, Energy efficient materials.

Sustainable Planning in Context of Urbanization, Spatial Planning and Architecture ***"Reanimation of an urban element in the inner green edge"***

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Abstract

Nature and architecture are in a constant and unbreakable relationship. In order to use this relationship positively, we should start by giving equal importance to both entities. With such a balance evaluation of the main creators of space, conditions are obtained for the beginning of creating a common whole.

Keywords: *public space, reanimation, attractor, elevated structure, layering, sustainable*

Thermal Bridges as a Problem Toward Energy Efficiency and Sustainable Architecture, their Inadequate Application in the Construction of Individual Residential Buildings in the Republic of Northern Macedonia

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ABSTRACT

Nowadays we are confronted with high air pollution in many regions of the Republic of Northern Macedonia, especially during the winter season. A large percentage of air pollution is caused by the energy inefficiency of buildings and the heating needs to fulfill their function, with the emphasis on individual residential buildings.

In this scientific paper we will study the problem of energy efficiency and architectural sustainability in individual residential buildings, treating thermal bridges and their inadequate realization as one of the main problems in construction towards energy efficiency and living comfort at the same time. The paper will show the details of thermal bridges, their inappropriate implementation during the construction of individual residential buildings and their impact on the building envelope, thermal comfort and energy efficiency.The study is based on important construction details such as foundations, terraces, balconies, flat and pitched roofs, which the author collected during a five-year work with design and supervision in the realization of individual residential buildings.Correcting the proper implementation details of thermal bridges allows to improve the energy efficiency of individual residential buildings in the Northern Republic of Macedonia and also to follow the objectives of the EU directives on energy efficiency.

KEYWORDS: Energy Efficiency; Thermal Bridges; Sustainable Architecure; Building Envelope; Thermal Insulation; Individual residential buildings.

GREEN FEATURES" - SUSTAINABLE AND BIOCLIMATIC STRATEGIES THAT IMPROVE THE QUALITIES OF THE SKOPJE'S URBAN MATRIX

Radmila Tomovska, Iva Petrunova, Hekuran Musli

Abstract

This research analyses certain sustainable urban strategies that are in correlation with the improvement of the air quality, air temperatures in summer period and improvement of the social cohesion of it's habitants. More precisely, this research discusses about the possible ways of application of the analyzed bioclimatic urban strategies for achieving sustainable solutions regarding urban planning and design of a public space in front of the railway station in the center of Skopje. The proposal for new green public space in front of Kenzo Tange's project from 1965 is designed to be context-sensitive and ecologically treated space. It is intended this project to be a new meeting point, with a strong modern attitude in its forms that respects the natural, historical, social and cultural context in which it is placed.

This study was conducted in the following steps. At first, the sustainable bioclimatic discourse was analyzed in order to give explanation which of the mentioned sustainable urban principles can be applied on the analyzed case. Then, different analytical methods and information from various scientific areas were used, which helped in detecting the real problems present on the analyzed location. In order to define the adequate bioclimatic strategies that will have ecological and socio-environmental qualities, the so called "green features" were established. "Green feature" in this research represents a sustainable quality of a particular strategy or urban measure that can improve the air quality, lower the summer temperatures, revitalize the chosen location, improve the social cohesion, create people centered urban design and redefine the city values.

Having in mind that this location is situated in dense and polluted urban matrix in the city of Skopje, the bioclimatic strategies recognized in this research were found as applicable solutions in the presented project. These strategies and measures can also be applied in wider urban context on cities with similar environmental problems.

Key words: Bioclimatic architecture, Sustainable urban strategies, Air quality, Regulation of the temperature, Social cohesion, Environmental urban planning, Fibonacci's numerical order.

Cities vague places as an opportunity to solve urban problems of publicness

Valbona Fejza

Abstract

In modern cities, the underlying collective and urban entities are increasingly immersed in the more prominent visual / commercial surface of the urban tissue. In this way, the social and collective structure of the place and its city significance is lost and forgotten. We are talking about several questions:

• How would the city regain and form the public, collective and city values that had lost during the expansion and the period of privatization and globalization?

• How will the former highway after the loss of its function will be connected in a spatial and programmatic sense with the center of the city?

• What's the collective role and how strong is it in the process of reviving and articulating the gaps along the highway making density without architecture?

• How to fulfill the various needs and quantities that are necessary during the summer and the rest of the year without causing uncontrolled construction?

The aim of this study is to achieve a recognizable place through architecture, which will offer identity and order, without being an aggressive instrument of power over the emptiness. The main emphasis will be on the continuity, continuity of the flows, the energies, the rhythms established by the passing of time and the loss of limits.

Keywords: *infrastructure, public space, thematic squares, architectural composition, radical context, field, sequences, collective, city, urbanism, events, city street, gate, permanence, flexibility.*

The effect of pandemic on service-learning courses

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Abstract

Service-learning is an educational approach that integrates learning objectives with community service in order to give a pragmatic, progressive learning experience while meeting community needs. The pedagogy of learning through community service is said to be a microevolution in higher education, as it helps students to experience life outside the campus (Cushman, 2002; Farnsworth, 2009). Similarly, professors at Universum College saw drastic changes in their students after taking the course "Community-Based Writing" in the Department of English Language.However, because of the pandemic, last year students of Universum College in Kosovo were not able to conduct their research in the said course due to COVID-19. This study examines how third-year students tried to attend online social justice campaigns, workshops, or training, in order to fulfill their credits for this class. Moreover, it will examine whether students found it difficult to help the community virtually. 50 students participated in this study from three different campuses: Prishtina, Ferizaj, and Gjakova, by filling out a questionnaire. The results suggested that students had many difficulties when it came to the swift between learning service-courses to digital learning. This was mainly because of technical difficulties, less activities in contribution of society because of isolation, and the change of learning outcomes. Learning outcomes will be examined in a special chapter, because most of them had to be re-written because of the COVID-19.

Finally, the study suggests methods on howstudents overcome the pandemic hit, and finished their projects, which were innately human-centric.

Keywords: service-learning, students, virtually, pandemic.

Analysis and comparison of commitment, homework, extra hours, preliminary grades and testing of students in Mathematics using linear regression with Excel and SPSS

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Abstract

In this paper, a simple and multiple linear regression model has been developed to analyze and compare the test results in two different classes in the high school "Rezonanca", more precisely the students of the two tenth grades in the subject of mathematics of classes X- 3 and X - 7. This model is based on student data, including homework, their classroom commitment, extra hours, pre-grades, and finally testing. Statistical meanings of the relationship between variables are provided. Excel and SPSS were used to obtain the results.

Keywords: Simple linear regression, multiple linear regression, homework, student commitment

Autopilot Tesla

Lindita Loku[1], Hekuran Nikçi[2]

Abstract

Through this research, we tried to address the following goals: One of the main issues is how much drivers believe in the autopilot system of the automatic direction of the car. After a study done after they had advanced two systems which were Autopilot and Summon drivers had great confidence in these two systems. Managers who experienced unexpected behavior from their vehicle reported much lower levels of confidence in Autopilot, but later confidence increased again despite experience. Autopilot is an advanced program from Tesla with features such as Autoseteer, Autopark and Traffic-Aware Cruise Control (TACC). It was first introduced in Tesla cars in September 2014. The company also promoted this softewer until the autopilot update. The first autopilot was made in October 2015 with the release of v.7.0 of Tesla OS.

KEYWORDS: data collection, disadvantages, antages, navigate, auto.

CONTEMPORARY MANAGEMENT OF EDUCATION IN THE MUNICIPALITY OF KAÇANIK

Hekuran Nikçi[1] Lindita Loku[2]

Abstract

In public high schools in Kosovo, as well as in the Municipality of Kaçanik there is a positive and cooperative climate is both ideal and reality. It is the duty of all actors and especially of leaders to create a favorable environment for student learning, to improve standards of behavior and learning. For most schools, the principal, as the person with the highest official position in the school, plays an important role in all aspects of school performance. The leader can foster or hinder a positive and cooperative climate through his leadership model. The purpose of this study is to study the relationship between leadership style and school climate. The research focuses on the importance of school management, the use of appropriate leadership style in different situations as well as the creation or improvement of the climate in public high schools in the Kaçanik, taking into account the issues: Leadership styles used in public high schools; The different types of climate that prevail in the school; The impact of leadership styles on the climate created in the school; Improving the school climate; The role of leaders, teachers, other stakeholders in improving the school climate. The population of this study are twelve primary schools-primary and lower secondary education and two secondary schools-upper secondary education. From this population, a sample consisting of two nationwide public high schools was selected. To study the relationship between leadership style and school climate 15 principals (13.3% of public high school principals) and 93 school teachers surveyed (90% of public high school teachers) were interviewed and surveyed. Data on schools, teachers and principals were obtained from the statistics of the Directorate of Education and Science in K.Kacanik. The results show that leadership styles influence the school climate. Extreme authoritarian as well as cooperative leadership styles influence the school climate. Collaborative leadership style improves, fosters an open school climate and strengthens teachers' perception that the institution is open and cooperative.

KEYWORDS: Leadership, leadership styles, leadership, leadership behavior, teacher behavior, achievement performance, school climate, open climate, indoor climate, climate perspectives, climate dimensions, school effectiveness, leadership relationships- teacher, teacher-teacher relations.

Implementation of Furie transformations in solving more characteristic integrals, image processing and their treatment usingMatlab

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Abstract

In this paper we have presented an application of Furie transforms in solving some more special integrals and comparing the solutions using Matlab. Their applications in image processing are also given, where are processed several photos. The image processing was accomplished through a code that was executed in Matlab.

Keywords: Fourier transform, Heavyside function, Dirack function, image processing, Simpson's method.

SLEEP PATTERNS AND SLEEP DISTURBANCES IN SCHOOL-AGE CHILDREN AMID COVID-19 PANDEMIC OUTBREAK

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Abstract

The pandemic outbreak and the global crises it has caused have brought to our lives many changes. Mental health issues are part of those consequences that have shown signs of coronavirus thread impacts, such as anxiety, depression, obesity(etc.),including sleep disturbances. The psychological distresses have become part of all major stages of human life circle, without excluding the children.

Sleep is established to be crucial to maintaining physical and mental health at a reasonable level of quality, especially it is very important for children growth and development. Therefore the disruptions of the normal sleep cycle can cause bad dreams, tiredness, mood instability, sever stress, anxiety, overuse of the internet, and can maximize behavioral problems and cognitive deficit which impact the ability to learn in school.

The present study is therefore focused on exploring the sleep patterns, sleep disturbances and other associated factors during COVID-19 pandemic outbreak in elementary school children. For the assessment of these issues we have used the Children Sleep Habits Questionnaire which is a parent – rated questionnaire that evaluates common pediatric sleep difficulties. The data were analyzed with the SPSS statistical software version 22.

From the research we were able to come to conclusions about few subscales that relate to common sleep problems in children such as: bedtime resistance, sleep onset delay, sleep anxiety, night waking, daytime sleepiness and parasomnia and have been able to compare the variable differences among the participant's school year. Other factors such as: parenting style, time spending on media, physical activity, food habits (etc.), have also been analyzed in relation to the main variable.

Keywords: sleep patterns, sleep health, children mental health, sleep disruptions, COVID-19

Some relations between the Euler and Archimedes constant, compared and visualized using Matlab

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Abstract

In this paper we will present some relations between the Euler and Archimedes constant, as well as some series representations of the Archimedes constant. These presentations will also be analyzed and the results achieved through Matlab software will be compared.

Keywords: Euler constant, Archimedes constant, Matlab

Migration of Moodle instance to the cloud – case study at Goce Delchev University

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Abstract

Migration to the cloud is really important for learning management systems. Migration can provide a better user experience and greater flexibility. Moodle with more than 246 million users is one of the most widely used learning management systems. During this period of the COVID-19 pandemic, the use of this system is intensified. Many universities, schools and organizations have started to conduct most of their learning activities online. This has increased the number of Moodle users. At the Goce Delchev University – Shtip we have been using Moodle for 10 years. In order to be able to serve all the requests of the users, good servers and infrastructure are needed that will provide uninterrupted access. Dedicated servers often cannot provide good scalability. Cloud technologies offer huge opportunities in this regard. The scaling they provide is extremely important when systems have an increasing number of users. So we need to think about migrating to the cloud. This paper presents the possibilities of cloud technologies as well as the procedure for migration of Moodle instance to the cloud.

Analysis of the Factors Influencing Youth Choices for Education: The Case of Kosovo

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Abstract

In Kosovo, in the discussions on the role of education in the sustainable development of the country, the issue of incompatibility of skills required and offered in the labor market and the rigidity of skills acquired throughout the education system has often been raised. A World Bank report[1],shows that in Kosovo 43% of large businesses estimate that the main obstacle to not filling all jobs is inadequate education profile of candidates. In addition to studying the skills gap in the labor market, it is important to analyze the process of choosing study majors and educational institutions by young people, focusing on the context of Kosovo.Therefore, the aim of this studyis to find: 1. What is the process of choosing the direction of studies and the institution of higher education by Kosovar youth, including the duration of this process, the factors that influence it and how and information sources consulted by young people during this process; and 2. What are the expectations of Kosovar youth regarding higher education in Kosovo? In this quantitative research we have included 561 high school seniors in the Republic of Kosovo, who were selected through stratified random sampling and were surveyed about their study choices and the factors that affect them. The results of the study show that there is a high level of indecision among high school seniors regarding the study programs they will pursue. They seem to leave the selection of a study program until the last minute and do not have a clear process of considering and assessing options for education and career. Students' GPA and family income appear to have the greatest impact on students' choices. Moreover, the vast majority of them have ambitions to find employment abroad immediately after graduating high school.

Keywords: youth, education, choices, trends, sustainable, employment

John Napier's bones method of multiplying numbers and the impact on increasing the ability to learn

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Abstract

The research aims to discover the improvement of students' achievements in the subject of Mathematics in terms of multiplication using the help of the method with John Napier sticks of number multiplication. This research was conducted in the context of classroom action research with sixth and seventh grade students. The context of the research is in the Primary Schools of the Municipality of Cair in Skopje. The population covers 400 students of sixth and seventh grades. The literature identified that John Napier's stick- based math learning lesson of number multiplication improves students' motivation and commitment to positively influence learning in the subject of mathematics. Our study focuses on a theoretical approach to studying the importance of John Napier's stick math game and multiplication of numbers in student learning, we will address how math teaching in 9-year schools can be improved in a way sensitive when the motivation of concepts and ideas is done through John Napier's stick multiplication mathematical game. From the interviews conducted with students it was identified that, the motivation and engagement of students in learning students through John Napier's stick math multiplication game had a positive effect on students' ability to concentrate and learn. Our focus on these results reflects the important goals of using John Napier's stick game multiplication of numbers for educational purposes, such that it has the potential to improve performance and increase engagement in educational activities. From this we conclude that playing with John Napier multiplication sticks improves students' intuition, awakens their curiosity, avoids memorizing unnecessary formulas, and puts concepts into proper historical perspective. The conclusion discusses the extent to which math games affect students' learning within the math class. Based on the object of the study, research questions, study hypotheses, its purpose, variables and methodology used to validate the study hypotheses were also designed.

Keywords - John Napier method, learning, mathematics, traditional teaching.

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Statistical analysis of student achievement using different ways of learning

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ABSTRACT

Education is a part of every human life. Till this year in our country we use to learn on traditional, classical way using whiteboard and presentations to present subject curriculum. But, this year the situation in education environments was dramatically changed. This situation was caused by pandemic which oculate the whole world and she led to online learning. In this paper will be analyzed and compared the results of the final exam for the subject Operating Systems for the students from different academic year: one from academic year 2018/2019 when the teaching was performed in a classical way and the second one from academic year 2019/2020 when the teaching was performed online through the platformMicrosoft Teams. Both group of students are from Faculty of computer science at University "GoceDelcev"– Stip and they study the subject Operating Systems in the fourth semester. The aim of the paper is using descriptive statistics and other statistical methods to draw a conclusion which way of learning gives better results in student achievement.

Keywords: Education, learning, statistical analysis.

COVID-19 model of learning – advantages and disadvantages

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ABSTRACT

Educational process, especially higher education was generally based on classical model of learning till 2020. This model includes table and presentations for teaching, and exams conducted in a classroom.Then e-testing in that classical model was introduced and included partly, only on some level of the educational process.Teaching was also in a classroom, but the way of testing was changed. Instead of classical exam on paper, students have an e-test on computer using Moodle 2 platform. The testing was performed in a classroom. Now, according to Coronavirus disease (COVID-19) situation all the process of teaching and testing are performed online using Microsoft team's platform.

In this paper we will analyze statistically the results of the first and second partial exam for the subject Mathematics for the students from different academic year: one from academic year when the exams was performed in a classroom, the second one from academic year when the e-testing was introduced and the third one from academic year when the testing was online. The students who were tested are from different faculties at University "Goce Delcev"– Stip.

Keywords: COVID-19, exams, testing.

Modeling some practical linear programming problems and solving them with Wolfram Mathematica

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Abstract

A natural mechanism for formulating a large number of problems is undoubtedly linear programming. Linear programming consists of a set of variables, an objective linear function that indicates the contribution of each variable to the desired result, and a series of linear constraints that describe the value limits of the variables. This paper will present the basic concepts of linear programming problems, modeling of some practical problems, solution methods, in which we will use the collection of Mathematica software algorithms to solve them with real variables accessed through commands. In this paper we will pay special attention to the layout of the problems as well as their preparation for processing with software, then proceeding to the interpretation of the obtained solutions.

Keywords *- linear programming, Mathematica, modeling, problem solving.*

Assessment of the emerging online education technologies and resources for learningduring the COVID19 pandemic

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Abstract

The purpose of the research study is analyses and assessment of the emerging online education technologies and resources for learning. As a result of the COVID19 pandemic the entire educational systems have undergone dramatic changes and unforeseen move and shift from classical classroom into digital online education. The research methodology used is triangulation technique which combines qualitative and quantitative methodology. As research method used questionnaire and focus groups.The research aims to approach the analysis of the emerging trends as well as the new online technologies that impacted online education using qualitative method and questionnaire as well as two focus groups. the Web has advantages in providing information quickly and easily. As the materials for guidance introduced on the Web are easily updated based on need or purpose, we can easily achieve maximum efficiency. The issues, findings as well as recommendations are discussed and argumented.

Keywords: online education technologies,resources for learning, covid19, digital online education, web technologies.

Implementation of the Geogebra program in mathematics teaching

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Abstract

This paper is based on the importance and application of GeoGebra as well as how useful this program can be in teaching Mathematics. GeoGebra contains geometry, algebra, statistics and calculation, dedicated to teaching and learning mathematics where this program used starting from primary school to universities. It can be used for active teaching and oriented towards various mathematical problems, it also encourages finding and developing various experiments in the classroom as well as in school. This paper therefore demonstrates the use of the GeoGebra program to construct, solve, and illustrate various mathematical problems.

Keywords*:* Geometry, algebra, calculations.

Use Of Social Networking Tools In Online Education During The Pandemic from Covid19

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Abstract

The purpose of the research study is analyses and assessment of the use of social networking tools in educationduring the pandemic from covid19. As a result of the COVID19 pandemic the entire classical educational systems has switched its focus and started to use more social networking tools not only in communication between peers but also in the online education process. There have been evidenced several teachers to use Facebook live to hold their online classes and created Facebook messenger groups with their students to post announcements and their assignments as well as to communicate and hold their consultation hours The research methodology used is triangulation technique which combines qualitative and quantitative methodology. As research method used questionnaire and focus groups.The research aims to approach the analysis of the social networking tools in online education during the pandemic from covid19using qualitative method and questionnaire as well as two focus groups in assessing the impacting factors as well as the level of knowledge transfer.The issues, findings as well as recommendations are discussed and argumented.

Keywords: social networking tools,covid19, digital online education, information system, web technologies.

ENVIRONMENTAL WORLDVIEW OF MACEDONIAN SCHOOL STUDENTS

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Abstract

The main purpose of this study is to explore the students' level of the environmental worldview in the Republic of North Macedonia. The study involved 251 high school students at age 15-18.Participants completed the New Ecological Paradigm scale- NEP scale (Dunlap et al., 2000), as the first psychometrically and conceptually sophisticated instrument to assess pro-environmental worldviews. This 15-item scale uses a 5-point Likert scale to measure endorsement of an ecological worldview.
The results of the study revealed a low endorsement of the NEP among the sample of Macedonian students (3.44 or 68.90%). This study confirms the thesis that environmental worldviews differ across cultures.The averages of the sub-dimensions varied between 3.24 ("Anti-anthropocentrism") and 3.79 ("Eco-crisis"). Like as others developing countries, there are no clear differences between pro-NEP and pro-DSP students' views in Macedonian context (the mean scores on the seven pro-DSP items, and eight pro-NEP items are 2.85 and 3.96, respectively). Compared with other countries, the findings of this study suggest that ecological attitudes among the sample are more closely characterized by the DSP. Many factors create pro-ecological attitudes of young people in a country. From that, we must look at student's attitudes towards the environment in context of the overall social-economic conditions in which we carry out the education process.

Keywords: environmental worldview, attitudes, students, revised NEP scale, The Republic of North Macedonia.

Computer vision in aerial scene recognition

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Abstract

Computer vision, as a part of artificial intelligence, gains significant attention from the scientific community in the last decade. Aerial scene classification is a prominent chapter of computer vision with a wide application: military, surveillance and security, environment monitoring, detection of geospatial objects, etc. Monitoring of environment is crucial for mitigating the effects of natural disasters on the environment and human population, and can be facilitated by the use of unmanned aerial vehicles (UAV), equipped with camera sensors that produce aerial photos of the areas of interest. A modern technique for recognition of events based on aerial photos is deep learning. In our article, we use transfer learning from pre-trained deep Convolutional Neural Networks (CNN) within remote sensing image classification. Transfer learning here is performed through fine-tuning with adaptive learning rates and a regularization method label smoothing. Additionally to the "end-to-end" training, we performed non-linear classification with SVM (Support Vector Machine) with Gaussian kernel on the extracted features from the fine-tuned CNNs. We demonstrate the potential of this techniqueon two remote sensing image datasets: AID dataset and NWPU-RESISC45 dataset. Our proposed method obtained competitive results compared to state-of-the-art methods, showing the potential to predict aerial scenes with high accuracy.

Contribution of 6GMobile Networks with Artificial Intelligence for Sustainable Development

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Abstract

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015 refers to 17 Sustainable Development Goals in almost every aspects of life which would further bring peace and prosperity for people and planet. Although most of these goals seem very ambitious the rapid advancements of mobile networks may play a major role in fulfilling these sustainable development goals. As 5G mobile network already begins to be commercially available, the main research and development activities focus on the next 6th generation of mobile networks, also known as 6G, which is expected to be commercially available around 2030. Machine Learning andgenerally Artificial Intelligence (AI) are becoming necessity forfurther expansion of the beyond 5G mobile world. AI-assistedIoT services, data collection, analytics and storage should benative in 6G networks. Terahertz,visible light communication and technologies like compressedsensing theory, new channel coding, large-scale antenna, flexiblespectrum usage, AI-based wireless communication and specialfeatures as Space-Air-Ground-Sea integrated communicationand wireless tactile network are few of the novelties that areexpected to become a common network standard of 6G.This paper gives an overview of the areas in which 6G network would contribute to achieve the UN 2030 sustainable development goals, as well as, a potential architectural design of 6G network which would bring such sustainable development.

Keywords: healthcare, protection, covid19, information system, evaluation.

Application of new mathematical models in the higher education evaluation process

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Abstract

The current situation with the reforms conducted in the last several years in Republic of North Macedonia, in terms of higher education do not give the expected results regarding the positions Universities have at the international rankings. Based on the Ministry of Education and Science, there are currently 17 accredited higher education institutions in the state and still there is not relevant, deep and comprehensive analysis conducted about their work. Working in the field of higher education showed that there is a possibility (still not automated and integrated) to examine the quantitive outputs in terms of educated staff, as well as scientific work and visibility in the Internet (Scopus, Webometrics, other sources), but the quantitive aspect is missing, as well as the comparison in between with locating the best of the best, thus knowing what are the best practices and who is conducting them. Also, there is lack in the approach of comparison the outputs with the inputs (what has been invested to produce those outputs) and answer the question of what is the price paid (not only in terms of finances, but broader). Bearing this in mind, the efficiency of our Universities is still a black box and for sure we claim that not being aware about it, we cannot hold any successful reform in the educational system and achieve higher goals and international rankings. The purpose of this work is to propose a new ways of evaluation the higher education system which could be applied not only for the domestic Universities. Mathematical modeling is used with elaboration of several specific methods, such as DEA, AHP, SFA etc.Some of them already applied in qualitative and/or quantitative evaluation of some parts of our educational system.

Keywords: DEA – Data Envelopment Analysis, AHP – Analytic Hierarchy Process, SFA – Stochastic Frontier Analysis.

The changing face of conversation: imperatives of visual and auditory perception as discourse markers

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Abstract

This paper looks at interpersonal functions of visual and auditory perception imperatives in authentic telephone conversations in Albanian language. Although they belong to the inventory of discourse markers that have received due attention in English scholarship, its equivalents *shiko/dëgjo* have remained largely understudied in the context of spoken interaction. Therefore, the existing research on *look/listen* may serve as a basic framework for contrastive analyses of interpersonal functions of its functional counterparts in other languages. The sample analysis performed through AntConc is discussed within the scope of the Speech Act Theory and it confirms that the imperatives for visual and auditory perception play a major part in the realization of the illocutionary force of the speech act itself.
The main hypothesis underlying our investigation is that the analyzed markers appear in initial syntactic positions in Face-Threatening Acts (FTA) with the core function: to signal the aim of the illocutionary force of the speech act within which they appear. To prove the hypothesis we conduct an analysis using data collected from authentic telephone conversations in Albanian whereby determining speech acts threatening the negative and positive face of the hearer (addressee). By discovering interpersonal functions of these widely-used discourse markers in Albanian we can enrich our understanding in conversational pragmatics and observe closely how new developments in communication are inciting changes in the way we interact.

Keywords: conversation, discourse marker, pragmatics, speech acts, imperative of visual perception, imperative of auditory perception.

Optimizing superchilling process of food products via full factorial statistic design

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ABSTRACT

In the trend of cold treatment processes of food products, superchilling has been defined as a process were the temperature of food product is lowered somewhere close (1-2°C) below of freezing point. It is considered that exactly the low temperature applied in this process was retaining freshness and quality of food products. The mechanism of the treatment is that such low temperatures successfully suppressing growth of microorganisms. Superchilling process as a cold treatment in food technology is very effective and innovative method for extending the shelf life of food products and retain the quality parameters, but in the same time is very sensitive. this statement leads to the fact that there is a great need of modeling and optimizing the superchilling of food products, but also the need applies to the food cold chain itself. The aim of this study was to develop full factorial statistic design that will give the desired parameters in the superchilling of food as a cold treatment process. Achieving our goal was divided in three stages. First was examined the superchilling system (refrigerator), exactly the air velocity, and air temperature as the most important factors. Second stage was related to the ambient environment of the food product (food packaging) as the direct layer between the cold air and the product, and from one side barrier of the product and air. Third stage was the quality of the product after the application of the superchilling treatment, more precisely the ice crystal formation as the main indicator of quality deterioration.

Keywords: *Superchilling, food quality, modeling and optimization, food cold chain*

Capsaicinoide content at traditional pepper (Capsicum annuum L.) variety "Stajkovski kavardzik"

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Abstract

In pepper fruits oftraditional variety "Stajkovski kavardzik" at the stage of technological maturitywere analyzed the content of of capsaicin and dihydrocapsaicin. Quantitative determination of capsaicinoids was done at randomly selected pepper fruits (n = 20) analyzed by using HPLC. A total of 10 manufacturers of this traditional variety were involved in the research as collaborators.The highest average capsaicin content is identifies at pepper produced in the village Stajkovci 5.37 mg/g d.m. while at those from village Bosilovo is the lowest 3.35 mg/g d.m.Usually the dihydrocapsaicin content is presented in the lower concentration than capsaicin and the lowest value is recorded in peppers from Katlanovo (0.98 mg/g d.m.), and the highest in those from Creshevo (2.46 mg/g d.m.). The total content of capsaicin and dihydrocapsaicin is the most presented in the variety of peppers from v. Stajkovci (7.49 mg/g d.m.), and the lowest in those from v. Rosoman (4.68 mg/g d.m.). Capsaicin extract has an antimicrobial effect and researchers recommend that it be used in the processing industry, especially meat, to protect microbial spoilage products with natural remedies.

Keywords*—pepper, traditional variety, capsaicin*

Implementation of the Geogebra program in mathematics teaching

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Abstract

This paper is based on the importance and application of GeoGebra as well as how useful this program can be in teaching Mathematics. GeoGebra contains geometry, algebra, statistics and calculation, dedicated to teaching and learning mathematics where this program used starting from primary school to universities. It can be used for active teaching and oriented towards various mathematical problems, it also encourages finding and developing various experiments in the classroom as well as in school. This paper therefore demonstrates the use of the GeoGebra program to construct, solve, and illustrate various mathematical problems.

Keywords: Geometry, algebra, calculations.

Development of a Thin-layer Chromatographic (TLC) Method for Determination of Caffeine in Black, Green, and White Tea

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Abstract

Caffeine is a substance present in tea giving the pleasant and stimulant effect. Several different types of teas, black, green, and white teas bought in market were analysis for caffeine content. The boiled sample tea was filtered through filter paper. Lead(II) acetate was used to separate tannins from caffeine followed by filtration through filter paper with black ribbon. The liquid-liquid extraction was carried out using dichloromethane (3x5 mL) and sodium sulfate as drying agent. The TLC method was performed on Merck pre-coated silicagel plates 5 x 10 cm ($60F_{254}$, 200 μm) using either methanol or dichloromethane as solvents and mobile phases was glacial acetic acid and ethyl acetate (95:5 *v*/*v*), while the second one was consisted of ethyl acetate and ethanol (80:20 *v*/*v*), respectively. The R_f values were 0.36 and 0.86 using the first and the second mobile phase, respectively in comparison to the standard caffeine. The values for pH of boiled sample teas were in the range of 4.85 to 5.80. The most abundant tea sample for caffeine was determined in green tea bought in the grocery store for health nutrition (2.04%). The yield for tea samples from green market, white tea and two tea black samples were 0.06; 0.71; 0.07; and 0.05%, respectively. The developed TLC method can be used for determination of caffeine content in tea samples.

Keywords—*caffeine, tea, black, green, white, TLC*

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Abstract

In recent years, 3D modeling is rapidly emerging as an additive manufacturing technology which can offer cost efficiency and flexibility in product development and production. This kind of technology has also been adopted in fashion industry, where simulations are being used for virtually assessing new products before they are actually produced. One of the main factors in textile dyeing is the large variety of chemical structures present in the modern fabrics. Cotton and modified cellulose do not give good fastness with simple anionic and cationic dyes. One of the most suitable groups of dyes is azo compounds. Azo dyes are obtained in two types of reactions which include diazotization and coupling. The goal of the research was to introduce 3D modeling in the education process with the comparison to the colouring of the materials. Cotton was bought at the local market and the colouring in microscale was achieved in alkaline medium using a 1M solution α-naphthol followed by applying of azo colour on the material. Visualization tests were conducted at various groups of age. The results can be used in the modern textile technology and education process where the students can learn to prepare the 3D modeling and after that to be able to use on the available material.

Keywords—dyes, 3D modeling, colouring, textile technology

A comparative study of autochthonous Walnut oil in the Republic of North Macedonia using different solvents

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Abstract

The oil from walnut oil is used in food industry processing energy and nutritive content. The aim of this work was to obtain oil from autochthonous walnuts. The homogenization of walnuts was achieved using pestle and mortar or nut grinder. The extraction process was carried out using the Soxhlet apparatus consisted of extractor chamber (250 mm) and condenser (300 mm) with various solvents such as *n*-hexane, diethyl ether, methanol, and chloroform (500 mL). The isolation of oil from autochthonous walnut oil samples from Golievo (municipality Mirkovci, near Skopje) and Kopanica (municipality Saraj, near Skopje) was done using simple distillation. The obtained oil was characterized in terms of physical appearance, the thickness and colour. The resulted showed that in case of using *n*-hexane and diethyl ether, pale to yellow oil was determined with satisfactory viscosity. With the use of methanol and chloroform, yellow-brown oil was obtained without consistency. The best solvents are considered to be *n*-hexane, diethyl ether where the yield was determined at highest values from walnuts from Golievo, 47% and 40%, respectively, while it was found that the yield was 18% and 17.36%, respectively in walnuts from Kopanica. The walnut oil with nutritive value can be used as food additive.

Keywords—*oil, walnut, Soxhlet, yield, solvents*

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Encapsulation of peroxidase from various vegetables in nanoemulsion formulation

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Abstract

Enzymes always gained attraction because of the significant action in the biochemical reactions in the living organisms. The aim of this research is to isolate enzyme *peroxidase* from vegetables horseradish (*Armoracia rusticana)*, broccoli Brassica oleracea var. italica*)*, spinach (Spinacia oleracea), swiss chard (*Beta vulgaris ssp. vulgaris var.cicla*), radish (*Raphanus sativus) and beetroot (Beta vulgaris ssp. vulgaris, var. vulgaris*) with phosphate buffer. Amount of 10 g of each vegetable was weighed, blended and centrifuged. The enzyme is encapsulated in nanoemulsion formulations as vesicles. Spontaneous emulsification as low energy emulsification method was utilized in the preparation of nanoemulsions using Tween 20 as surfactant. The ammonium sulfate method was used for protein precipitation and total protein concentration was determined. The developed emulsions were characterized with optical microscope for the physical appearance. The emulsions were transparent or translucent where the total added volume of the surfactant was 0.6 mL for *Armoracia rusticana*. The encapsulated enzymes can be used in long-term conditions.

Keywords*—peroxidase, nanoemulsions, encapsulation, microscopy, plants*

Analysis of the Relationship Between Biochemical Markers, Gender and Body Mass Index

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Abstract

Obesity is a major and growing problem worldwide. The aim of this study is to determine the relationship between the body weight and gender with biochemical parameters suspected to be related with obesity. Our sample consisted of 26 adolescents from North Macedonia. Obesity was measured using the body mass index (BMI) and weight groups were determined according to the World Health Organization (WHO) guidelines. We collected blood samples for biochemical marker analysis (glucose, total cholesterol, triglycerides and total proteins). Tukey's Honest Significant Difference test was used to test each pair of groups for the parameters where ANOVA showed statistically significant differences among groups. High BMI was positively associated with blood glucose levels. Statistically significant relationship was found between weight group and blood glucose level ($p = 0.042$). No statistically significant relationship was found between weight group and the remaining biochemical parameters. The main implication of our study is that obesity is a potential risk factor for diabetes.

***Keywords**: obesity, BMI, glucose, lipid profile, total proteins.*

THE INFLUENCE OF COVID - 19 ON NUTRITION: CASE OF KOSOVO AND ITALY

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ABSTRACT

Healthy eating has an impact not only physically but also mentally. As such facts have positively influenced people to pay attention to the population's well-being.

However, the rise and outbreak of the virus that caused the global pandemic has greatly influenced the form of nutrition of different ages in Kosovo and Italy.

In this paper, qualitative and quantitative methods in the form of questionnaires were used, surveying 100 people of different ages. The surveys were conducted online in 7 cities of Kosovo and 7 cities of Italy.

Among others, the paper will address some crucial issues, such as: the frequency of consumption of meals, the frequency of consumption of beverages and their types, information on products, the amount of storage of goods before and during the pandemic, types of consumption of products, fast food versus home-prepared food, online or physically, etc.

Keywords: Nutrition, COVID-19, fast food, home prepared food, meals, online orders, Kosovo, Italy.

Sustainability of media use in the Republic of Northern Macedonia at the time of COVID-19

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Abstract

During the time of lockdown associated with COVID-19 the media industry experienced a tremendous increase in demand for information content and entertainment all over the world. In this article we try to find answer to the following questions: (1) What impact did the pandemic have on media consumption among potential consumers in the Republic of Northern Macedonia? (2) How was the information about the COVID-19 virus spread by the media? (3) What media were most used in Macedonia to get information about the virus and the situation caused by the COVID-19 virus? (4) Which forms of the media were the most reliable for obtaining information about COVID-19? This paper is an empirical study that will provide answers regarding media consumption in the Republic of Northern Macedonia at the time of the Covid-19 pandemic. About 200 people were surveyed in the period from September to December 2020 regarding their behavior towards the media during the pandemic and the way of informing about the situation caused by COVID-19. All surveys were conducted with the same methodology and were conducted as an online survey (survey, questionnaire). A survey specification by age and gender groups provides the paper with representative results in order to find out the correlation between the reliability amongst traditional media and contemporary media such as internet and other social networks.

Keywords: Covid-19 media related information, media sustainability, media consumption, information reliability.

Geopolitical disputes in the Black Sea Region

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ABSTRACT

Global Geopolitics of the 21st century has a changing geopolitical contest. From monopolarity it slips towards multipolarity and to interpolarity from economic well-being in recession. Within global framework, at the end of the first decade of this century, the outgoing administration of former US President Bush, tired of the war on terrorism and the financial crisis, seemed to leave behind a weakened US. The Obama's administration was expected to revel in the tired world superpower, against Russia's rebound from energy gain under Putin's presidency.

Since 2008 Russia began to impose itself globally, after the invasion of Georgia to the presidency of Medvedev. China and India appeared as a rising powers not only in the economy. Brussels affected by the internal institutional crisis, economic, energy and ecological crisis, hardly came to impose any new international relations report. It seemed that the geopolitical weight of the Western Balkans was losing the strength of the importance towards the South Caucasus and the Mediterranean. The eastern and southern borders were challenging European security, not just political but above all in the energy security.

Such a leading EU compass left little room for its expansion towards the Western Balkans, while Brussels's attention was directed towards Euro-Asia and the Middle East. The Euro-Atlantic Factor, (US and EU) remains inevitable in Euro-Asian geopolitics of the 21st century. Two others also remain the key (Russia and China), while Turkey remains a regional, and a group of geopolitically-defined states that emerged from the former Soviet Union (Ukraine, Moldova, Belarus, Georgia, Armenia, Azerbaijan, Turkmenistan, Kirgizstan, Kazakhstan, Mongolia), for these states clashes will go on to put them into the influence zone of the abovementioned global factors. Afghanistan, Iraq and Iran cannot be avoided as borderline factors. The latter, together with Saudi Arabia, will be two key factors of the other geopolitical axis of the Middle East. The harshening of Iran-Saudi Arabian bilateral relations in January 2016 only stressed out the rivalries of these two major Middle East regional powers.

Keywords: Geopolitics, Geostrategy, EU, Russia, Euro- Asia, NATO.

In search of sustainable peace: Peace proposals prior to the Dayton Agreement

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Mother Teresa University

ABSTRACT

During the 1990s, United Nations promoted the idea for peaceful settlement of conflicts. That approach was endorsed regarding the war in Bosnia, too. Mediation process begun primary within the International Conference on Former Yugoslavia, representing the joint efforts of UN and EC. Firstly the Vance – Owen Peace Plan and later the Owen – Stoltenberg Peace Plan had been rejected by the adversaries. Nevertheless, under mediation of USA, the Washington Agreement was concluded and it was one of the fundaments for the upcoming peace talks, including the Dayton Agreement. Considering that several peace initiatives took place along all those years and proposals on peace agreements many times were refused by the adversaries, this paper aims to understand in what way timing of the efforts for resolution determined success of the mediation process. Contextualizing the mediation process through the concepts on "*positive peace*" and on "*ripeness*", it is concluded that without reaching mutually hurting stalemate signingof the peace agreements had been very demanding process.

Keywords: positive peace, ripeness, mediation, peace proposals, Bosnian war

Pyramidal financial crisis in Albania: Reflection of regional rivalries between Greece and Turkey within Operation Alba

Drenusha Kamberi
Mother Teresa University

ABSTRACT

The situation in Albania seriously deteriorated after the collapse of the pyramid schemes, in 1997.The Government lost control over large part of the country.In condition of anarchy, it requested international assistance. UN Security Council responded positively and approvedthe resolution for multinational protection force. Referring to the Chapter VII of the UN Charter, in the resolution 1101 it was underlined that participating countries must "*conduct the operation in a neutral and impartial way*". Greece and Turkey were among the states that showed interest to contribute. Theyhad approximately samenumber of troops deployed in Albania. Commitment to regional stability was accompanied also by intend for enhancing bilateral relations with Albania. The purpose of this paper is to analyze the political rivalrybetween Greece and Turkeyapparent into the planning and conduct of core activities of Operation Alba. Furthermore, the paper examines howoverlapping strategic interests of regional powers in rise restrain cooperation during peacekeeping operations.

Keywords: regional rivalry, pyramid schemes, peacekeeping, Greece, Turkey, Albania, Operation Alba

International community must fulfil uncompleted work in Bosnia and Herzegovina

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Abstract

There is an overall agreement that security and stability are the key prerequisites for sustainable development of the region and beyond. Shareholders hesitate to invest in areas where minimum security and stability standards are not guaranteed. The Western Balkans countries are still suffering to fully integrate int to Euro-Atlantic associations, primarily NATO and the EU, what places them at the bottom of the wellbeing bar. This article concentrates particularly on the obstacles for the progress in Bosnia and Herzegovina, as well as their impacts on the entire region and beyond. Analyzing the rule of international community, alongside with internal players, there is a large evidence of initiatives and activities, however the assessments will investigate whether all these efforts are synchronized with the integration's objectives. The analysis will include player's interests and complementarity of endeavors, their competence and efficiency, as well as outcomes, all that in order to show impact on the integration processes but also on the overall security and stability. There are tangible indications of a deliberate slowing down of the developments, which has been enabled by insufficient legal and political circumstances that are created and cultivated by international community. There is an empirical evidence of numerous failed actions and projects, directly influencing overall progress and future of the country, which is substantial for the entire region and beyond. Conclusion that might be derived from this study is that country is facing decisive point in its integration process, being also threaten by disintegration, which would pose a huge risk to the entire region. Suggestions may include an immediate and comprehensive engagement of international community with concreate agenda and goals, including the political and legal component.

Keywords - security, E-A integration, obstacles, region, Bosnia and Herzegovina, international community

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Student in European and International Studies

Abstract

A multiethnic and multicultural society can bring many benefits, but it can also be perceived as a threat. Multiculturalism is neither a norm nor a value in itself, but a fact in almost all developed countries today, a consequence of economic developments, migration movements and globalization processes, political persecution, armed conflicts, social hardship and ecological overexploitation.

It is in the nature of things that multiculturalism allows different interpretations, because the question of how social coexistence is regulated naturally finds different answers. But despite these many ideas, there seems to be no real concept, or, to put it another way, a systematically developed theory of multiculturalism, so far. This circumstance is probably due not least to the conceptual instruments, because there is a lack of clear definitions of terms such as “culture”, “civilization”, “multicultural society” etc. So “culture” is sometimes referred to as “everyday life”, “local sense of purpose”. or as an absolutely "homogeneous structure".

Ranging from the “educational value” to the “inevitable evil”, a broad spectrum of divergent views and explanations opens up to the viewer, whereby the concept of multiculturalism is charged with sometimes contradicting contexts.A multiethnic and multicultural society can bring many benefits, but it can also be perceived as a threat.

In addition to multiculturalism as a description of reality in the scientific debates of the 1990s, the word interculture came up when it comes to activities and actions in a multicultural society. Like multiculturalism, interculture assumes the existence of different cultures in a society that are expressly recognized as legitimate forms of expression that are worth protecting, provided they do not violate the rights of others and the minimum democratic consensus. The term focuses more on the existing cultural differences than multiculturalism and focuses on exchange, dialogue, communication "between", that is, "inter", with people from different cultures. The emphasis here is on participation, getting to know each other, mutual exchange and common communication about what separates and connects, from which something new and third can and often arise.

Keywords: Multiculturalism, Interculturalism, Reception, culture, civilization.

ELECTRONIC MODEL D-MP CASE STUDY IN THE ASSEMBLY OF REPUBLIC OF NORTH MACEDONIA

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Abstract

In this paper the advantages of the electronic model called D-MP (Digitalization of the Member of Parliament) concept are reviewed, a concept which makes this institution more efficient. A special attention is paid on specific indicators and competencies which are needed in order to embezzle this model, as well as the methodological properties which are to be applied whose final goal is to give a comprehensive analysis of the model. Information and communication technology (ICT) make easier the implementation of the D-MP model which instead ensures transparency, accessibility, efficiency and effectiveness of the parliaments. The models used for writing this paper include theoretical analysis and synthesis. The introduction of e-communication, e-parliamentary library and e-reports on parliamentary job is directly related to the efficiency of the MP. The subsystem of information management in the Parliament is the basis of full release from pressure on democracy, which is indeed helped by ICT (e-democracy). This model represents a platform for making it easier the processes in which are included MPs, and represents the relation among the MPs and the larger part of the population. This platform would integrate ICT infrastructure, processes and human resources in order to reach the given goals.

Keywords*—Digitalization, Digitalization ofthe member of parliament (D-MP), ICT, Assembly, Democracy, Pattern, law, constitution.*

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