

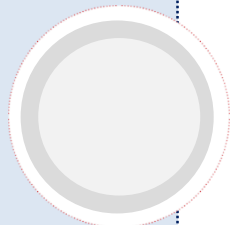
Book of Abstracts

INTERNATIONAL CONFERENCE ON NEW ACHIEVEMENTS IN

SCIENCE, TECHNOLOGY AND ARTS

ICNA-STA

4 – 5 May 2023, Prishtina, Kosova



The University of Prishtina (UP) and the International Business College Mitrovica (IBC-M) collaborated to organize the event, in partnership with a consortium under the Erasmus+ initiative called "ResearchCult - Enhancing Research Culture in Higher Education in Kosovo."

The book features abstracts from the interdisciplinary event, **"International Conference on New Achievements in Science, Technology and Arts" (ICNA-STA)**, held in Prishtina, Kosovo, on May 4-5, 2023.

The conference, an interdisciplinary research event, sought to showcase ground-breaking scientific advancements across a broad spectrum of disciplines, including Natural and Environmental Sciences, Agricultural Production, Food Safety, Education, Economics, Finance, Management, Marketing, Philological Science, and Art. By bringing together diverse fields, the event aimed to foster collaboration, encourage interdisciplinary dialogue, and promote the exchange of ideas and knowledge among researchers, scholars, and practitioners. The conference emphasized the importance of understanding the intersectionality between various disciplines to address complex global challenges and to facilitate sustainable development. The event provided a platform for project partners to present their achievements, explore opportunities for collaboration, and discuss the scientific potential of their joint efforts. Co-organized by numerous local and international higher education institutions, the conference ensured a comprehensive and diverse representation of academia, research, and industry experts. These institutions contributed to the conference's organization and scientific structure, providing valuable input and resources to develop a robust, thought-provoking program. The conference featured keynote speakers, panel discussions, research presentations, and poster sessions that covered a wide range of topics relevant to the involving disciplines. This allowed attendees to engage in a dynamic exchange of ideas, share their latest research findings, and build networks for future collaborations.





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The **International Conference on New Achievements in Science, Technology and Arts – ICNA-STA** aims to provide an annual scientific forum and an interdisciplinary perspective and collaboration among researchers of various scientific disciplines from research institutions in South East Europe, European countries and USA. It also offers opportunities for researchers, academicians and industry experts to meet and interact with local and international participants on how to best:

- Utilize and enhancing academic learning by integrating research and innovation;
- Enhance cooperation between the academia and public and private institutions through usage of research and innovation outcomes;

More specifically, the main objectives of the ICNA-STA are to:

- Provide a forum for discussion about the latest scientific contribution in various areas of science;
- Focus on the impact of the research and innovation in the scientific fields covered;
- Discuss and compare the experiences in all scientific areas covered in this conference;

The scientific contributions were clustered around the following key areas and their respective sub-areas:

1. Natural & Environmental Sciences
2. Agricultural Production and Food Safety
3. Medical/Health Sciences
4. Education Sciences
5. Economics, Finance, Management and Marketing
6. Information technology and communication
7. Technology & Engineering
8. Social Sciences and Human Rights
9. Philological Sciences and Arts
10. Intellectual Property Protection in the Metaverse and AI

The ICNA-STA conference is a co-organization of consortium partners of the Erasmus + Capacity building Program “Enhancing Research Culture in Higher Education in Kosovo (ResearchCult)¹, as a joint effort put among scientists of organizing institutions and other scientists who contributed to the conference with valuable scientific presentations. This brings the cooperation tradition between the partners now set as far as three years ago.

This book presents the abstracts present thus the third edition of the conference, containing summaries of research work related to education and training, technology and engineering, economics, social, health and environmental sciences, arts and other interdisciplinary research achievements and scientific potential of the project partners.

¹ <https://researchcult.net>

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Keynote presentations

Quasi-Periodic Materials – A Paradigm Shift in Crystallography

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Abstract

The Abstract should not exceed 350 words. It should consist of research goal, key methodology, main research results and a brief summary. It should be typed in Times New Roman, font size 12, single-spaced, followed by maximum 5 key words.

Crystallography has been one of the mature sciences. Over the years, the modern science of crystallography that started by experimenting with x-ray diffraction from crystals in 1912, has developed a major paradigm – that all crystals are ordered and periodic. Indeed, this was the basis for the definition of “crystal” in textbooks of crystallography and x-ray diffraction. Based upon a vast number of experimental data, constantly improving research tools, and deepening theoretical understanding of the structure of crystalline materials no revolution was anticipated in our understanding the atomic order of solids.

However, such revolution did happen with the discovery of the Icosahedral phase, the first quasi-periodic crystal (QC) in 1982, and its announcement in 1984 [1, 2]. QCs are ordered materials, but their atomic order is quasiperiodic rather than periodic, enabling formation of crystal symmetries, such as icosahedral symmetry, which cannot exist in periodic materials. The discovery created deep cracks in this paradigm, but the acceptance by the crystallographers' community of the new class of ordered crystals did not happen in one day. In fact, it took almost a decade for QC order to be accepted by most crystallographers. The official stamp of approval came in a form of a new definition of “Crystal” by the International Union of Crystallographers. The paradigm that all crystals are periodic has thus been changed. It is clear now that although most crystals are ordered and periodic, a good number of them are ordered and quasi-periodic.

While believers and nonbelievers were debating, a large volume of experimental and theoretical studies was published, a result of a relentless effort of many groups around the world. Quasi-periodic materials have developed into an exciting interdisciplinary science.

This talk will outline the discovery of QCs and discuss their structure as well as the role of TEM in the discovery.

[1] D. Shechtman, I. Blech, *Met. Trans.* 16A (June 1985) 1005-1012.

[2] D. Shechtman, I. Blech, D. Gratias, J.W. Cahn, *Phys. Rev. Letters*, Vol 53, No. 20 (1984)

Studying DNA damage and repair: a retrospective

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Abstract

It is almost 50 years since I started to study DNA damage and repair. At first, cultured hamster or human cells were the subject, and DNA breaks were measured by alkaline sucrose sedimentation, soon superseded by alkaline unwinding. This method involves incubation of cells in alkali, which causes DNA to denature; the strands start to unwind from the ends of the molecule, or from any breaks, so after a set time there is a mixture of single and double stranded DNA; the % of ssDNA reflects the break frequency. It is a laborious technique, but using it we were able to demonstrate – against the prevailing opinion – that nucleotide excision repair of UV-induced damage could be blocked with standard inhibitors of DNA replication, which caused incision events, normally transient, to accumulate. In the late 1980s, I was introduced to the comet assay, and realised that it could be applied to the study of DNA damage and repair in human blood cells. We modified it to measure not just DNA breaks, but also oxidised bases; in addition, we measured breaks introduced by H₂O₂, as an indicator of antioxidant status. With those tools, we carried out the first of many human trials – testing the ability of dietary antioxidants to decrease DNA oxidation in lymphocytes. Later, we developed a comet-based in vitro repair assay, in which a cell extract was incubated with a substrate of nucleoids containing specific base damage. A trial with kiwifruit supplementation showed, as well as decreased DNA damage, enhanced DNA repair. Individual base excision repair capacity varies widely; is this because of intrinsic (genetic) differences, or because – for instance – exposure to DNA-damaging agents can induce repair? I will discuss this and other questions relating to the significance of DNA damage and repair – and I shall stress the importance of making our findings known not just in the scientific community but also in the real world.

Key words: *DNA damage; DNA repair; antioxidant status; human biomonitoring*

New approaches to hazard and risk assessment of nanomaterials. RiskGONE perspective

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Abstract

The use of engineered and advanced (nano)materials (ENM) is greatly increasing in innovative products and technologies. Their safety depends on an intimate knowledge of physicochemical properties and their interactions with target biological systems. Though principles established for standard chemicals apply also to ENMs, nano-specific considerations must be addressed. ENMs must be fully characterized; the dispersion method used and the characterization of ENMs in exposure medium must be assessed, as ENMs tend to agglomerate and this can influence results; and the testing strategy for ENMs needs to be accompanied with studies on uptake of ENMs by cells. It is especially important, when negative results are obtained, to demonstrate that cells are in contact with ENMs.

The standard approach in risk assessment relies on animal models which are time consuming, not economical or ethical, and extrapolation from animals to humans is challenging. Therefore, to facilitate fast and efficient hazard assessment, new approach methodologies (NAMs) that include advanced *in vitro* and *in silico* models are under development. Additionally, the complexity of understanding potential ENM risks versus their benefits encourages a shift from traditional risk assessment, to more complex and holistic approaches. The development of specific OECD test guidelines (TGs) for hazard assessment of ENMs (or modification of existing TGs), as well as new advanced models, is therefore a priority. The H2020 RiskGONE project aims at developing tools to better predict the impact of ENMs on human health and the environment, for a more holistic ENM safety policy (<https://riskgone.eu/>). Significant efforts towards standardization and validation processes for ENMs have been undertaken through the evaluation, optimization, and pre-validation of standard operating procedures (SOPs) or TGs, with a series of inter-laboratory studies. Sets of SOPs for physicochemical characterization, and human and environmental hazard assessment have been adapted for testing ENMs and will be suggested for OECD TGs. Additionally, new advanced lung and liver models and high-throughput methods are being developed, standardized and pre-validated to support the implementation of NAMs in the next generation of risk assessment (NGRA).

Acknowledgement: The RiskGONE project has received funding from the European Union's Horizon 2020 program (Grant Agreement no 814425).

Key words: *engineered nanomaterials, hazard and risk assessment, new advanced methodologies (NAMs), test guidelines, RiskGONE project.*

Neural network approximation and sampling rate

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Abstract

The goal of the work is to show the vital importance of sampling rate of the real function on its representation using neural networks (NN) modelling. In the literature there is abundance of papers discussing various approximation problems. The problem that is very common for practical applications is the so called under sampling phenomenon. Often the modelling is undertaken on the drastically under sampled data sets where no attention whatsoever is given to it. Using AI is very tempting since it provides the approximation solution on practically any data set given, no matter how well it represents the observed problem.

So far the Shannon – Nyquist sampling theorem still stands where a function $f(t)$ contains only frequencies lower or equal to B [usually in Hz], it is completely determined by data points spaced $1/(2B)$ apart. A sufficient sample-rate is $2B$ samples/second, or higher. For a given sample rate f_s , perfect reconstruction is thus possible for a band limit $B < f_s/2$. But here the strict reconstruction process needs to be undertaken. In practice the sampled function is not reconstructed using Fourier series, approximation techniques are utilized instead. To establish the conditions where the approximation process gives satisfactory results without actually performing the reconstruction, the practical relation $f_s > 10B$ was consensually established. Instead of two data samples per period of the highest frequency present in the sampled function, at least ten are required to allow acceptable quality of approximation.

This work does not attempt to formally prove the concept of interdependence between the sampling rate, band limit, and the quality of NN based approximation. The practical conclusions drawn from a large number of structured experiments suffices. The experimentally supported research indicates that when using the NN approximation the commonly accepted sample rate of $f_s > 10B$ should be extended to $f_s > 15B$ to compensate the variability of the NN supported approximation of functions.

Key words: *Neural Networks, AI, approximation, sampling frequency.*

Variation of Sage in Albania (*Salvia officinalis* L.)

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Abstract

Sage (*Salvia officinalis* L., Lamiaceae) is an important medicinal and aromatic plant used against skin disorders, minor wounds, mouth and throat disorders, and gastrointestinal disorder. Many of these activities are due to the accumulation of an essential oil of distinct composition(s). Sage is also an important export crop for Albania and other countries of the Western Balkans.

We analyzed the essential oil composition of sage from different locations in Albania. A clear geographical gradient could be observed from North to South Albania, basically based on the relation between the thujones and camphor. The differences between the Albanian provinces were so pronounced that the essential oil profile can be used to determine the origin of trade materials down to the level of provinces with a high certainty. The samples from Shkodra and Gjirokastra were the provinces with the highest identification security, where 93% of the samples could be correctly assigned to. Within the thujones, a further genetic variation (genotype) was detected concerning the ratio between α - and β -thujone.

The composition of the essential oil of sage is therefore not only an important quality criterion but also useful in identifying the origin of trade samples.

Key words: *sage, Salvia officinalis, Albania, geographical origin*

Tools, policies and best practices for environmental protection and agriculture in Kosovo through Jean Monnet Module

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Abstract

Realization of the Jean Monnet Module on teaching and research in Kosovo, through the multidisciplinary educational process, stimulated young generation of Kosovo academics - professors and researchers and the region, to collect, elaborate analyses and disseminate European Union standards facts and knowledge particular in the field of environmental protection and agriculture. This approach provided conditions and resources for implementation of sustainable EU standards that can improve efficiency and reduce environmental impact, increase the agriculture production and economic growth where scholars, civil society, and policy makers could effectively design tools and actions aimed to move toward a healthy environment and sustainable economy.

The main outputs of the Jean Monnet Module was to increase of awareness of learners, group of researchers and practitioners in long-term in key aspects of EU environmental policies effectiveness and challenges, and to strengthen the collaboration between Kosovo higher education institutions and European academic institutions that will actively design a Multi-Level and Multidisciplinary Approach model and emphasize the issues of European Integration, application of EU standards on environment protection and agriculture in the region using EU best practice. This Jean Monnet Module is one of the very first European study courses in Kosovo that prepares future professionals in environmental protection and agriculture by bringing the best European practices into transforming economy of Kosovo. The results bring the application of the Multi-level and Multidisciplinary Approach as a new platform for practical and theoretical collaboration between scientists from natural and social sciences using EU best practice standards.

Key words: *Jean Monnet Module, Multi-level and Multidisciplinary Approach, environmental protection, agriculture production, EU best practice.*

1. Natural & Environmental Sciences



Geno- and cytotoxicity of the air samples assessed in primary rat hepatocytes

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³ In memory of Peter M. Eckl who for many years was accompanying our research and passed away unexpectedly and too early during our cooperative research presented here.

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Abstract

Environmental pollution is one of the most significant actual problems in Kosovo. Emissions from industrial facilities such as those from coal-fired power stations in Kastriot/Obiliq, Industrial Complex located in Mitrovica as well as from the iron and nickel smeltery in Drenas/Gllogovc, continuously influence the quality of the air in Kosovo. Moreover, traffic-related pollution in cities and agricultural pollutants, further contribute to additional emissions. In order to assess the risk arising from air pollution, air samples for this study were taken from the vicinity of the Power Plants in Kastriot/Obiliq, as well as from the vicinity of the iron and nickel smeltery in Drenas/Gllogovc. Air samples from Prizren were taken as control. Air samples were collected four times during the period 2016 -2019 (summer 2016; autumn 2017; spring 2018 and summer 2019). Gaseous fraction of the samples (representing a final concentration of 20 L air/mL) was applied on primary cultures of rat hepatocytes and (i) cytotoxic (necrosis, apoptosis, and mitotic index) and (ii) genotoxic effects (assessed by Comet assay and micronucleus assay) were evaluated.

The obtained data showed no increase of the percentage of the necrotic and apoptotic cells (compared to control), whereas an inhibition of the mitotic index was observed in the autumn 2017 samples from Drenas/Gllogovc and Kastriot/Obiliq. Regarding genotoxicity, an increase of DNA damage was observed in the autumn 2017 samples collected in Drenas/Gllogovc compared to control (Prizren). On the other hand, the samples collected in autumn 2017 in Drenas/Gllogovc and Kastriot/Obiliq caused lower percentages of micronucleated cells compared to samples collected in Prizren.

Beside the clear indication for the genotoxic risk, observed seasonal variations, and insufficient information on the toxicants, indicate the need for continuation of the investigations.

(This study was supported by the project "Environmental Health Studies: A Programmatic Partnership between the University of Prishtina and the University of Salzburg" funded by Austrian Development Agency (ADA) with funds of Austrian Development Cooperation(ADC), and co-financed by the Ministry of Education Science and Technology of Kosovo (MEST)- financed by HERAS - provided support for this research).

Keywords: Air pollution, cytotoxicity, genotoxicity, rat hepatocytes

The impact of mining activities on the oxidative stress of the *Achillea millefolium* and *Hypericum perforatum* in the industrial area in Drenas and Mitrovica

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Abstract

Heavy metal pollution arising from industrial activities is prevalent in Kosovo, especially around industrial centres such as Drenas and Mitrovica. Thus, the current study aims to assess environmental pollution in the industrial areas (Drenas and Mitrovica) using the plant species *Achillea millefolium* and *Hypericum perforatum* as bioindicators. Plant species collected in Peja (a remote area from industrial centres) will be used as a reference point. Malondialdehyde (MDA), a lipid peroxidation product, has been used as a biomarker to evaluate oxidative stress in both plant species. The spectrophotometric method was used to determine the MDA level, and the results were compared using the ANOVA Tukey test. MDA level in both plant species was higher in Drenas than those originating from the Peja locality ($p < 0.01$). *Achillea millefolium* collected in Mitrovica and Peja had a similar level of MDA, while the MDA level in *Hypericum perforatum* from Mitrovica was significantly higher than in the plant material collected in Peja ($p < 0.01$). Based on the findings, we conclude that the oxidative stress (MDA values) were higher in Drenas and Mitrovica compared to plants originating from Peja. This might be due to pollution which is coming from mining activity in these areas.

Key words: *Industrial pollution, oxidative stress, MDA, Achillea millefolium, Hypericum perforatum*

Mapping vegetation vulnerability using geospatial technology: application to Prishtina, Kosovo

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Abstract

The influence of factors of different levels on the reduction and loss of vegetation is known as the vulnerability of vegetation. We have used roads, land use, slope, and settlements as variables first to determine the vulnerability of vegetation and then to analyze it. In Kosovo in general, and Prishtina in particular, extraordinary pressure has been exerted on natural vegetation. Given the negative effects of vegetation changes, to minimize or, at best, stop it altogether, we tried to investigate the degree of vulnerability of vegetation and its causes in the Municipality of Prishtina. Considering the influence each factor has regarding the effect they have on the vegetation, this paper classifies these factors based on their impact. We have done this based on the rankings previously made by different experts and on the importance of each factor—the weight of the impact using GIS and Remote Sensing. Their calculation was done using the pairwise comparison method, and, for each factor, their cartographic presentation was done using a weighted overlay. From all this, in the end, the map of the risk of vegetation vulnerability was compiled. The results showed that the areas most at risk of degradation lie close to the roads in which human activities stand out; areas where the slope of the terrain is gentle—suitable for human activities; and areas in which land use has been done in an unplanned manner. Whereas, in contrast, in all those areas in which preliminary planning for land use has been made—positive administration; in areas where the slope is high—unsuitable for human activities; and, in areas far from roads, are less vulnerable to vegetation degradation. Furthermore, to avoid the worst, which is the degradation of the natural environment, every action must have proper planning—there should be (positive) planning for land use and positive practices for natural resource management.

Key words: *Vegetation vulnerability, GIS, Remote Sensing, factors weighting.*

The potential of the nettle plant *Urtica dioica*.L in phytoremediation of soils polluted by heavy metals

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Abstract

In this research project, we measured the potential of plant (*Urtica dioica*, L) in phytoremediation of soil polluted by heavy metals (Pb, Zn, Ni) from activity of mining Trepça Complex in Mitrovica.

Climatic factors such as winds, rains, and temperatures are believed to be major contributors to the spread over time and space of heavy metals in the environment. Large quantities of these metals come from natural and anthropogenic sources including mining activity, agriculture, pesticide use, industrialization. These inorganic pollutants are deposited in the soil, water, and atmosphere in various forms of complexes and are thus transmitted from plants, animals to humans.

Soil samples, nettle plant (*Urtica dioica*, L), were collected from the selected pollution source of mine Trepça complex at distances of 1km, 2km, and 5km in the radius circles divided into four geographical areas. Also the control samples are collected in unpolluted site Opoja- Dragash municipality. The samples were digested in microwave at 200⁰C for 45 min and have been read in two types of absorbers Thermo and Contra AAA.

Higher concentrations of Pb, Zn, and Ni were recorded in the southern parts of the country compared to that control with significant differences (p<0.01). Bioaccumulation and biomagnification levels of these heavy metals have also been recorded in the roots, stalks, and leaves of the stinging nettle plant (*Urtica dioica*, L).

The results show that the stinging nettle plant has translocated larger amounts of these heavy metals especially Pb along with the vegetative organs wherefrom these they are carried in the snail shell, which is fed on the stinging nettle plant.

Also, results shown that the nettle plant *Urtica dioica* can be used in phytoremediation process of soil pollution from heavy metals.

Keywords: soil, bioaccumulation, mine complex, metals, stinging nettle.

Parasite fauna of Prespa barbel (*Barbus prespensis* Karaman, 1924) from Prespa Lake (Macedonia)

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Abstract

Eight out of the eleven indigenous fish species of Prespa Lake are endemic. One of these endemic fish species is the Prespa barbel (*Barbus prespensis*).

Fish material from 42 specimens of Prespa barbel sampled from the Macedonian part of the Prespa Lake, were subjected to routine identification, dissection, and observation, as well as, examined for parasitological investigations. Cleaned parasites were separated, put in appropriate fixatives, and prepared for determination using techniques of staining and clearing. The parasite specimens were identified using the reference keys of parasite determination. Common statistical analyses by calculation of mean prevalence and abundance of parasite species were used.

The parasitological examination showed that 36 out of 42 examined specimens (85,71%) are infected with parasites. Nine parasite species were identified: 2 monogeneans (*Dactylogyrus dyki* and *Paradiplozoon zeller*), one trematode (*Parasymphylodora markewitschi*), two nematodes (*Raphidascaris acus* and larvae of *Contracaecum microcephalum*), two acanthocephalan (*Metechinorhynchus truttae* and *Pomphorhynchus bosniacus*) and two crustaceans (*Ergasilus sieboldi* and *Argulus foliaceus*).

The most prevalent parasite species was *Paradiplozoon zeller* (84,70%), while the highest intensity of infestation was recorded with *Dactylogyrus dyki* and *Ergasilus sieboldi* (8,50).

Key words: Parasite fauna, Prespa barbel, Prespa Lake

Taxonomic – status of the *Centaurea melanocephala* Pančić and *C. albertii* Rexhepi (sect. *Acrocentron*, fam. *Asteraceae*)

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Abstract

Kosovo has several endemic plant species which belong to the genus *Centaurea*, including *C. melanocephala* Pančić and *C. albertii* Rexhepi. *C. melanocephala* (syn. *Centaurea candelabrum* Hayek & Košanin) shares many similar morphological characteristics with *C. albertii*. Due to that, applying traditional methods based on morphological characteristics for their identification is challenging, and these species have sometimes been treated as synonyms and are often erroneously identified. Novel approaches based on chemical and molecular DNA markers are needed for their proper identification and classification. Plant materials were collected from four wild populations (*C. melanocephala*: Bajgorë and *C. albertii*: Devë, QafëPrush and Golesh) in Kosovo (Jun-September 2021). Volatile compounds and DNA markers (ITS, trnL-trnF, rbcL, psbA-trnH and rps) are employed to evaluate their taxonomic status. Volatile compounds were extracted using hydro-distillation and then analyzed with gas chromatography coupled with mass spectrometer (GC–MS) and flame ionization detector (GC–FID). Plant DNA was extracted using the DNeasy Plant Mini Kit, amplified using PCR and then sequenced by a capillary DNA analyzer. The main volatile components were (E)-Caryophyllene, Germacrene D, Caryophyllene oxide, Germacrene-4 (15), 5, 10 (14)-trien-1- α -ol, Hexadecanoic acid, (Z, Z)-9, 12-Octadecadienoic acid, (Z, Z, Z)-9, 12, 15-Octadecatrienoic acid, n-Tricosane, n-Tetracosane, n-Pentacosane and Heptacosane. The analyses based on volatile chemical constituents and DNA markers did not show significant differences between the analyzed species, indicating that *C. albertii* and *C. melanocephala* should not be treated as distinct species. This work shows that volatile chemical constituents and genetic data can be used as markers to determine these species' taxonomic status. Further analyses with more *Centaurea* species will be necessary to better understand the natural variability within these taxa. Understanding their taxonomic status is crucial in determining the strategies for their conservation.

Keywords: *Centaurea albertii*, *C. melanocephala*, phylogenetics, phytochemicals, genetic markers.

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Assessment of persistent organic pollutants in water samples from the River Sitnica, Kosova

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Abstract

This study presented data about concentrations of some organic pollutants in Sitnica river in Kosova. Twenty stations were analyzed in this study. Sampling of water was realized in January/February 2023. In this study were analyzed organochlorine pesticides (OCPs), their degradation products, polychlorinated biphenyls (PCBs), BTEX (benzene, toluene, ethylbenzene and o-, m-, p-xylenes) and polyaromatic hydrocarbons (PAH). For extraction of OCPs and PCBs by water samples were used liquid-liquid (LLE) extraction and n-Hexane as extracting solvent. After clean-up and concentration procedures for all samples were performed gas chromatographic analyzes using Rtx-5 capillary column (30 m x 0.33 mm x 0.25 μ m) and electron capture detector (GC/ECD). Headspace solid phase micro extraction (HS-SPME) technique was used to trace BTEX in water samples. For isolation of PAH, LLE extraction assisted with dichloromethane as extraction solvent were used. The analysis of BTEX and PAH in water samples was performed by gas chromatography technique using flame ionization detector (GC/FID). Injections of BTEX were done directly by using Head-Space mode of Poly dimethyl Siloxane fiber. VF-1ms capillary column (30 m x 0.33 mm x 0.25 μ m) was used for separation of BTEX and PAH compounds. The high concentrations of organochlorine pesticides and PCBs were found in the Sitnica river because of their previous use, in the agricultural areas near the basin of this river. The higher concentrations were for volatile PCBs because of their atmospheric deposition in Kosova territory. Relatively high concentrations of BTEX and more volatile PAH compounds were detected also in the Sitnica river. The presence of volatile organic pollutants could be mostly of automobilist transport near the stations, discharging of wastes from some gas stations or some mechanical industries near the river.

Key words: Sitnica River; OCP; PCB; BTEX; PAH; LLE; HS-SPME; GC/ECD; GC/FID.

Classification of radionuclide's Through Gamma Spectrometry

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Abstract

Before starting any type of radioactive waste action is necessary to determine the content of their activity, the type of radioisotope, physical and chemical form and the risks associated with their management. This is achieved through a combination of quality assurance processes such as inventory radioisotope balance of activities present in the residue, the composition of the waste material and by direct measurements. The investigation was performed entirely in the ground and was undertaken because of source certification lacks or any other indication for their classification and activity. In the context of radioactive waste classification for determining the activity of different sources that were located in different institutions, was used bond that exists between the activity of a radioactive source and power that creates the equivalent dose radioactive source at a certain distance from the detector. Classification is essential in the case of waste composition and origin unknown. This is a complex process that is the foundation of gamma radiation spectrometry.

Key words: *radioactive waste, radionuclide's, classification*

Phytochemistry and biological activities of the plants traditionally used as food and medicine in Kosovo

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Abstract

Kosovo is an European biodiversity hotspot, characterized by a high diversity of vascular plants too. Moreover, it is also a hotspot of cultural, linguistic, and religious diversities, making the region a unique area for ethnobotanical research. Although Kosovo is rich in Traditional Ecological Knowledge (TEK), only one research was conducted last century. Recently, like in other Western Balkans countries, the interest in ethnobotanical studies rapidly increased in Kosovo too. This is due to the increasing interest of EU countries in finding a market for medicinal and aromatic plants and increased research interest to document TEK in areas which are trying to build their future on sustainable uses of natural resources and eco-tourism. Ethnobotanical studies in Kosovo are conducted in different geographical regions, such as the Gallaku region, Albanian Alps, Sharri Mountains, Shala e Bajgore, Drenica and Anamorava region. Some of the research was focused on documenting TEK on only one ethnic group, while others were focused on comparing the TEK among different ethnic communities living in Kosovo. Moreover, other research focused on a specific domain, such as using plants for fermentation, teas, etc. The phytochemical screening was carried out for some of the most used plant species, such as *Hypericum perforatum*, *Juniperus communis* and *J. oxycedrus*, *Pinus sp*, *Satureja montana*, *Malus sylvestris*, *Tilia platyphyllos*, *Humulus lupulus*, etc. Furthermore, the volatile chemical compound responsible for flavours and fragrances of the plants used traditionally as tea was analyzed. Except for the chemical composition, the plant traditionally used as food and medicine in Kosovo were also analyzed for their biological activities. Thus, the antioxidant activity of *Satureja montana*, *Malus sylvestris* and *Pinus sp*, the antimicrobial activity of *H. perforatum*, *Pistacia terebinthus* and *Pinus spp*, anti-inflammatory, anti-carcinogenic and cytotoxic effects of *Pinus sp* were evaluated. Moreover, the genotoxicity and anti-genotoxicity of *H. perforatum* were assessed too. The information on traditional uses of plant species and the data regarding their chemistry and biological activities are crucial for developing strategies for conserving plant resources and their sustainable uses and developing local foods and medicine based upon local bio-cultural heritage.

Key words: Kosovo, ethnobotany, phytochemistry, biological activities

Levels of volatile organic compounds in water samples of Vlora Bay

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Abstract

In this paper are presented the concentrations of some volatile organic compounds (VOC) in water samples of Vlora Bay. This area could be affected by VOC because of intense ship transport inside the bay, industrial activity in the area of Vlora area and urban wastewaters from the city of Vlora as well as from the new arrivals from Vjosa River. Vlora Bay is a natural bay in which there are located several ports such as the port of Vlora, Petrolifera, the fishing port, etc. The volatile organic pollutants that were analyzed in this study were chlorobenzenes and BTEX (Benzene, Toluene, Ethylbenzene, ortho-, meta and para-Xylenes). The water samples were taken in July 2022, at 12 different stations of the Vlora Bay starting from Petrolifera to Radhima station. The head space solid phase micro-extraction (HS/SPME) method was used for the extraction and quantitative analysis of VOC followed by gas chromatography (GC) techniques. This method presents advantages for the analysis of volatile pollutants because it excludes the use of organic solvents and sample treatment steps. The sensitivity and reproducibility of HS is favorable for VOC in water samples. Adsorption of organic pollutants was performed on a polydimethyl siloxane (PS) fiber while the desorption process was realized in the gas chromatograph injector at high temperature. The qualitative and quantitative analysis of chlorobenzenes was carried out in the GC/ECD apparatus, while the analysis of BTEX was carried out in the GC/FID apparatus. Volatile organic pollutants were present in almost all the samples analyzed. BTEX were detected at higher levels. Their presence is related to the high intensity of transport within the Vlora Bay area. Benzene was the compound that was most frequently identified in the highest amount for all samples. Chlorobenzenes were also detected for all analyzed samples. 1,2,4-Trichlorobenzene was identified at the highest level. The presence of chlorobenzenes may be a consequence of urban spills, cleaning/sanitization solvents, as degradation products of other compounds (pesticides, PCBs, etc.), farming, etc. The presence of BTEX and chlorobenzenes in the water samples of Vlora Bay indicates that the monitoring of this area should be continuous.

Key words: Vlora Bay; BTEX; Chlorobenzenes; HS/SPME; GC/FID/ECD.

Survey of T-2/HT-2 toxins in Kosovo wheat grain

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Abstract

This study aims to provide data on the occurrence of T-2/HT-2 toxin in wheat grain samples grown on Kosovo fields. To investigate into the T-2 and HT-2 toxin occurrence, 30 samples of unprocessed wheat cereals were sampled from *Fusha e Kosovës* located in Kosovo, during January/February 2023. In all samples, sum concentrations of T-2/HT-2 toxin were determined using the ELISA method, while the LC-MS/MS was used as a confirmatory method for both mycotoxins in positive samples (>LOD). The levels of T-2/HT-2 toxins found in this study in the analyzed samples of wheat grains in Kosovo were quite worrying. Yet, further studies are needed in order to identify measures to be taken during cultivation and storage to prevent T-2/HT-2 contamination of cereals. Given the explicit toxicity of T-2 and HT-2 toxin, their synergistic effects and high incidence in cereals, it is necessary to systematically monitor these mycotoxins in all stages of food and feed production, as well as to stipulate their maximum permitted amounts in different types of foodstuffs and feedstuffs.

Key words: *Fusarium mycotoxins; T-2 toxin; HT-2 toxin; Occurrence; LC-MS/MS.*

The usage of technical oxygen for fuel combustion and how it affects the rotary kiln's performance

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Abstract

Typically, atmospheric air is used in industrial rotary kilns to facilitate the combustion of fuels. All rotary kilns' combustion processes can be used with technical oxygen for fuel combustion. The horizontal rotary kiln is used as a research case for the production of sintered MgO at "MIM GOLESHI".

The study demonstrated that the combustion of fuel only with technical oxygen as a result of an increase in an adiabatic flame temperature of fuel by 830 °C indicates on: increasing the efficiency of fuel combustion, reducing the number of gas emissions, increasing the temperature of the fuel flame and improving the stability of the fuel flame temperature, better heat transmission inside the furnace, and increasing the furnace's productivity.

As a result of technological process improvements, calculations show that sinter magnesite (SM) production increased by 897 kg SM/h or 12.55%, fuel consumption decreased by 11.834 Nm³ / T SM or 84.58 Nm³ / h or 12.55%, carbon dioxide gas emissions decreased by 39.044 Nm³ CO₂ / T SM or 279.05 Nm³ CO₂ / h, and nitrogen gas emissions were eliminated.

Key words: rotary kiln, sintered magnesite, technical oxygen, adiabatic flame temperature.

Invasive alien plant species (IAPS) in the eastern region of Kosovo: a preliminary list

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Abstract

This paper presents a preliminary checklist of invasive alien plant species (IAPS) in the eastern region of Kosovo. This list was compiled based on a literature review and numerous field surveys. The list includes 20 plant taxa with information on taxonomic affiliation (Family), life form, native range and type of habitat(s) they invaded. Most species belong to Asteraceae family, followed by Fabaceae and Balsaminaceae. Therophytes are the predominant life form. There are two genera, each with two species: *Erigeron* L. (*Erigeron annuus* (L.) Desf., *Erigeron canadensis* L.) and *Impatiens* Riv. ex L. (*Impatiens balfourii* Hook.f. and *Impatiens glandulifera* Royle), while others are represented by only one species. The majority of IAPS in the eastern region of Kosovo are from America (65%), followed by Asia (30%) and with only one species from Africa (5%). The habitats most heavily colonized by IAPS are the areas along roads, waste places, riverbanks and cultivated areas.

Key words: *alien flora, biological invasions, plant invasions, biodiversity, Balkans*

DNA damage in oral mucosa cells of patients treated with chemotherapy

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Abstract

Chemotherapy is very important in cancer treatment, while side effects continue to be a concern for patients and clinicians. Currently, a number of tests are applied and obtained data are important for risk assessment due to exposure to different agents.

Comet assay and the micronucleus test have been widely used for evaluating the damage of genetic material, while buccal cells are shown to be a suitable source of biological material for genotoxicity studies.

The purpose of this study was to give an overview of the effect of chemotherapy on the genetic material of oral mucosal cells in patients diagnosed with cancer which are being treated at the University Clinical Center of Kosovo and comparing data with those from untreated individuals. The extent of DNA damage and the frequency of micronuclei was assessed in oral mucosa cells of a group of patients of similar age and the level of the damage was correlated to the treatment duration, age, gender and specific disease. The study involved 40 patients of the Oncology ward at University Clinical Center of Kosovo and 40 randomly selected control individuals. The study was approved by the HUCSK (Hospital and University Clinical Service of Kosovo) Ethical Committee. Participation in this study was voluntary.

The results of this study show elevated levels of DNA damage in the buccal cells of patients with different types of cancer who have been treated with chemotherapy (compared with the control group - random sample of individuals). As a result of treatment with chemotherapy, they were found to be statistically significant increased percentage levels of Micronuclei in buccal cells of patients (compared with the control group).

The data obtained indicate that there is no significant correlation between genetic damage and age within the patient group, which be explained by the fact that they already have significantly elevated levels of damage due to chemotherapy treatment.

Key words: DNA damage; oral cells; chemotherapy, micronuclei

Improved photocatalytic activity of TiO₂@rGO nanocomposite for removal of organic pollutant from water

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Abstract

The presence of an increasing number of organic pollutants in the water poses serious issues to human health and the environment. Many of these organic pollutants are persistent and non-biodegradable. The pollutants of fresh water by harmful pollutants require researchers to develop innovative, efficient, sustainable, and cost-effective materials for water treatment. Advanced oxidation processes have the potential to efficiently degrade organic pollutants from water. The photocatalytic process uses catalyst and light to produce radicals. Radicals possess a high redox potential, e.g., hydroxyl radicals $E^\circ = 2.72$ V that react with the molecular structure of various pollutants and degrade pollutants into harmless products. Thus, photocatalysis is recognized as a favorable approach to tackling pollutant removal and saving energy. However, semiconductor photocatalysts have limitations such as photo-generated charge carrier recombination, wide band gap energy, and slow surface reaction kinetics. Disadvantages can be remedied by appropriate modifications of physico-chemical, and optical properties of TiO₂. Overcoming the limitations present in TiO₂-based photocatalysis, as well as the search for potentially efficient materials, is extremely important, and the modification of TiO₂ with carbon-based materials like graphene is promising due to its unique properties. Therefore, graphene and its derivatives have been widely used as supports for semiconductor materials and photocatalysts due to their distinctive physio-chemical, optical, and electrical features.

In this research, an attempt has been made to utilize the excellent properties of graphene by coupling it with TiO₂ nanoparticles. Synthesis of nanocomposites of TiO₂ with reduced graphene oxide has been done by hydrothermal/solvothermal synthesis followed by calcination at 300 °C. Prepared nanomaterials were characterised using scanning electron microscopy, X-ray diffraction, Raman spectroscopy, and transmission electron microscopy. Photocatalytic degradation was performed using methylene blue as a model pollutant under simulated solar light (300W Osram Ultra Vitalux bulb) as a source of irradiation.

The obtained results of performed photocatalytic tests show the improved removal rate of methylene blue dye from an aqueous solution using prepared TiO₂@rGO nanocomposite in comparison with bare TiO₂ nanoparticles.

Key words: *titanium dioxide, reduced graphene oxide, nanocomposite, photocatalysis*

Chemical analysis of waste engine oil and its recycling possibilities

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Abstract

Waste engine oil contain hazardous components such as sulphide, heavy metals and PAH. The degradation processes of engine oils during operated under higher temperature were subject of analysis after clean up procedure by column chromatography and identification by infrared (IR) spectroscopy. In order to carry out the qualitative analysis of the waste engine oil sample, the components of the used oil were first separated through column chromatography. To separate the oil into fractions, the following solvents were used: cyclohexane, benzene and methanol. An evaluation of the Fourier transform infrared spectroscopy (FTIR) spectrum of an engine oil sample was presented. The infrared spectra of both fresh and used oils were recorded with the Irtaffinity-1 Shimadzu model. For the used engine oil differentiation process, FTIR spectra were analyzed in the region of 1000-4000 cm⁻¹. Comparing the spectra of the pure solvents with the spectra of the fractions separated with the corresponding solvent shows the presence of functional groups which could be part of the compounds that may be harmful to the environment. In the spectrum of the fraction separated with cyclohexane at the peak 1496 cm⁻¹, the absorption of organic compounds containing nitrogen is observed. In the third fraction separated from the mixture of polar and non-polar solvent (methanol-benzene in the ratio 1:1), in the region 1300-1370 cm⁻¹ there are peaks that characterize sulphur-containing compounds, as and the peak 1200 cm⁻¹ for the C=S=O bond. Based on the chemical analysis of waste engine oil, methods have been developed for its treatment such as: re-refining into base oil for reuse, trading as fuel and distillation into marine diesel fuel oil. The recovery of used motor oil by the method of distillation in vacuum-treatment with clay, as well as the extraction with solvents are more environmentally friendly method compared to the method of treatment with acids that creates acidic sludge. The results may explore chemical compounds present after degradation of chemical constituents of engine oils.

Keywords: Fourier transform infrared spectroscopy (FTIR); column chromatography, waste engine oil, recycling

The effects of acute ingestion of graphene oxide (GO) on the blood parameters in mice (*Mus musculus-swiss albino*)

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Abstract

Objective: The aim of the study was to determine the effects of graphene oxide on the blood and urine parameters in mice *Mus musculus*, after ingestion through intragastric tube.

Materials and methods: For this study we used ten mice (male, average weight 30-32.5 gr, 9-month-old) divided in two groups. The first group served as a control group; the second group was treated with a single dose (20µl/100 ppm) of two-dimensional graphene oxide. Treatment was done by intragastric gavage. Five days after administration of graphene oxide, the blood samples were collected from the facial vein. The animals were in a cage and had access to taping water and food.

Results: Our results showed that the single dose graphene oxide intoxication has had an impact on cellular level of blood. We have registered significantly lower values of leukocytes and thrombocytes in the graphene oxide group compared to the control group. Erythrocytes, hematocrit, and hemoglobin values were also decreased (non-significantly) in the graphene oxide group compared to the control group.

Conclusion: Graphene oxide administered in a single dose has significant effects on cellular count of blood parameters.

Key words: *Graphene oxide, hemogram, hematocrit*

The effect of excessive usage of caffeine ($C_8H_{10}N_4O_2$) on the blood parameters of *Mus musculus* – swiss albino.

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Abstract

Objective: The aim of this study was to determine how Caffeine affects the blood and urine parameters of *Mus musculus*- swiss albino. Caffeine is one of the main ingredients of energetic drinks and coffee.

Materials and methods: For this study we used two groups of mice each containing five male individuals that weigh 30-35gr. The first group served as a control group that was fed with normal water, the second group was fed with water that contained 0.32gr $C_8H_{10}N_4O_2$ per 1L water for seven days. This dosage corresponds to the dose of caffeine in energetic drinks. We used Sysmex XN-L330 blood analyzer to measure 22 blood parameters, known as hemogram parameters.

Results: Results show that as a mean value most of the parameters analyzed in groups treated with caffeine have lower values. Leukocyte concentration was significantly lower in the caffeine treated group compared with the control group. Erythrocytes, hematocrit, and hemoglobin values were lower in the caffeine treated group compared with the control group. Thrombocyte values in the opposite with other parameters were slightly increased in the caffeine treated group compared with control.

Conclusion: Excessive usage of stimulants and energetic drinks have an impact even in cellular counts in blood, thereby should be studied the interaction with the hematopoiesis.

Key words: *energetic, hemogram, hematocrit*

The effect of Taurine ($C_2H_7NO_3S$) on the blood parameters of *Mus musculus*- swiss albino

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Abstract

Objective: The aim of this study was to determine how taurine affects the blood parameters of *Mus musculus*- swiss albino. Taurine is one of the main ingredients of energetic drinks. Excessive usage of taurine can lead to many health problems.

Materials and methods: For this study we used two groups of mice each containing five male individuals that weighted 30-35g. The first group served as a control group that was fed with normal water, the second group was fed with water that contained 4g of $C_2H_7NO_3S$ per 1l of water for seven days. This dosage corresponds to the dose of taurine in energetic drinks. We used Sysmex blood analyzer to measure 22 blood parameters, known as hemogram parameters.

Results: Results have shown that leukocyte and thrombocyte values in the taurine treated group were significantly ($p < 0.05$) lower compared to the control group. Erythrocyte, hematocrit, hemoglobin values did not show significant differences between the control and the treated group. There were no significant differences in values of different types of leukocytes.

Conclusion: Excessive usage of taurine can affect cellular level of blood. These changes can be seen even after a week of excessive usage of doses of taurine that are found in energetic drinks.

Key words: taurine, energetic, hemogram, hematocrit.

Effect of abamectin acute ingestion on hemogram parameters in the *Mus musculus* mice

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Abstract

Objective: The study aimed to determine the effects of Abamectin in blood parameters in *Mus musculus*-Swiss Albino mice.

Materials and methods: For this study, we have ten male mice divided into two groups. The first group (N=5) which served as a control group, and the second group (N=5) was treated with a dose of Abamectin in concentration 1/20 LD50 which was given as 10µL solution. The treatment was done by intragastric gavage. Mice were fed a normal diet and water. Blood samples were collected 7 days after administration of the treatment.

Results: Our results have shown that even a single dose of 1/20 LD50 of Abamectin have significant effects on blood parameters. Leucocytes, hemoglobin and hematocrit values were significantly lower in Abamectin treated group compared to control group. Thrombocyte values were increased in Abamectin group compared to control group. Erythrocyte values were lower (non-significantly) in Abamectin treated group.

Conclusion: Abamectin as a pesticide have shown to affect blood parameters even in small doses as 1/20 LD50. The registration of blood parameters after 7 days shows the long-term effects of pesticide toxication.

Key words: pesticide, hemogram, hematocrit, abamectin.

Chemical profile of *Hypericum Perforatum L.* population from kosova by using gas chromatography technique

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Abstract

Kosovo, as part of the Balkan area, has suitable conditions for the growth of more than 3000 different species, of which more than 250 are medicinal and aromatic plants. These plants have been used since ancient times in traditional medicine, culinary preparations, and cosmetics. This study aims to provide data on chemical analysis for the essential oil of *Hypericum perforatum* plants from the Gjilani area, located in south Kosovo.

Hypericum perforatum plants were selected at five different stations in Anamorava mountain in the Gjilani area. The plants were sampled in July 2022. The air-dried plant samples were grinded, and after that, they were subjected to the European Pharmacopoeia apparatus (Clevenger type) for 4 hours to obtain *Hypericum perforatum* essential oil. The chemical composition of the essential oils was analyzed using GC/FID technique. *Hypericum perforatum* oil samples were injected in a Varian 450 GC. VF-1ms capillary column (30 m x 0.33 mm x 0.25 μ m) was used for the separation of compounds.

Gas chromatographic analyzes of the essential oil of *Hypericum perforatum* showed that their chromatograms contained 30-45 compounds. The interpretation considered 21 main compounds that were from 92.1 to 95.4%. The largest group of terpenes were monoterpenes, with around 65%. Bicyclic monoterpenes were found in high percentages in all samples. The main compounds identified in all samples were: alpha + beta-Pinene, beta-Ocimene, beta-Cariophyllene and Germacene D. The profiles and percentages presented in this paper were comparable with recent publications for the Balkan and Mediterranean areas.

Key words: *Hypericum perforatum*, Essential oil, Hydro-distillation, alpha + beta-Pinene, GC/FID.

The application of GIS in designation of the relief value as a natural resource on Drenica area (Kosovo)

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Abstract

Relying on current achievements in science, in particular the application of GIS, RS (Remote Sensing) and construction of the digital relief model (DEM), an analysis of the relief features of the Drenica Area and prospects for utilizing its current and future natural resources has been conducted. Through these techniques and their applications, we have calculated and analysed the analytical, quantitative and qualitative parameters of the relief of the area for a shorter time compared to classic methods.

Analysis of analytical parameters of the relief, according to the degree of horizontal and vertical fragmentation or relief energy, with a preferential purpose for the categorization of forms, comparing and presenting them as a possibility for socio-economic exploitation. The application of GIS, ArcGis software is important to calculate the parameters of relief structures through GIS environment using data from Landsat 8 OLI (Operational Land Imager) and TIRS (Thermal Infrared Sensor) DEM with a spatial resolution of 30m. To calculate this parameter, a grid with 1x1 km cells with interpolation points in each cell was constructed. IDW was chosen as the most suitable method for the interpolation of points. Those tools helped us to achieve those results: the maximum value of relief's energy for Drenica area reaches 360m/km², where 73.4% of the surface belong to very low and low values of relief's energy and 26.6% belong to average and high value of relief's energy. Based on the methodology we have values of slope terrain, where 33.59% percent of area belong to low slope 0-15° and the other part 66.41% belong to high slope from 5° to over 15°.

Extracting these data through GIS techniques is of particular importance in identifying all forms of relief in the Drenica area and their use for mineral extraction, construction of settlements, dams, road and railway network, surface of agricultural land etc. Hence, we think that the contribution of this paper is of great importance to students, teachers and researchers.

Key words: *Morphometric parameters, GIS, DEM, Resources, Drenica area*

DNA damage in buccal mucosa cells of the patients with otorhinolaryngologic diseases

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Abstract

Available data show that various chemicals cause damage to genetic material, therefore the early detection of genetic damage is needed to prevent or reduce exposure to harmful agents of the genetic material, as well as to reduce the risk of certain diseases.

The micronucleus assay and comet assay are among the methods frequently used when assessing the damage of the genetic material. It is also shown that the combination of these methods increases the capacity to detect the effects on the genetic material.

The purpose of this study was to obtain an overview of the damage to genetic material in the oral mucosa cells of patients with various otorhinolaryngological (ORL) diseases, comparing the data with those of the control group individuals.

The study included 40 patients of the ORL ward at Peja Regional Hospital and 40 randomly selected control individuals. The study was approved by the HUCSK (Hospital and University Clinical Service of Kosovo) Ethics Committee. All individuals / patients received the study information and, in case of acceptance of participation, expressed their consent to the by signing the relevant form.

The results of this study show differences (increases) in the level of DNA damage in the buccal cells of patients with different types of otorhinolaryngological diseases (compared with randomized control sample of individuals), as well as an increase in the frequency of micronuclei in patients compared to the frequency observed in control group.

Despite the limited number of individuals included, and the issues related to the application of the comet method in buccal cells, the data from this research give a clear indication of the need for further research and more additional data from clinical aspects in order to obtain a clearer overview of the causes and mechanisms of genetic material damage.

Key words: *DNA damage; buccal cells; otorhinolaryngologic diseases; micronuclei*

Modification of Fly Ash for ecological application

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Abstract

Environmental pollution, especially water pollution, has become a serious issue worldwide and a challenge for sustainable development policies. Also the waste generated in the process of its combustion (Fly ash) is a serious problem. The aim of this research work was to create and to characterize the Fly ash/Chitosan composites aimed for heavy metal adsorption in polluted waters.

Six sample of Fly ash waste particles were used, from the ferronickel industry EURONICKEL and from the thermal power plant OSLOMEJ, North Macedonia, which are collected in November. Types of waste materials which was used are: FA-OS Start, FA-OS NaOH, FA-EN Start, FA-EN NaOH, EAFS-EN Start and EAFS-EN NaOH. The surface of the Fly ash (FA) particles was modified by treated with nitric acid (HNO₃), then samples mixed with EDTA 0.1M and dried on 100°C. The biopolymer Chitosan was added to 10wt%oxalic acid solution formed a viscous mixture. Then acid treated Fly ash was added in the viscous mixture. The samples washed with distilled water and dried on 55°C. The characterization of the Fly ash/Chitosan composites was performed by elemental composition X-ray fluorescence analysis (XRF) crystallographic structure X-ray diffraction analysis (XRD), thermogravimetric analysis (TGA), morphology and internal structure (Scanning electron microscopy SEM, Fourier Transform Infrared Spectroscopy FTIR analysis.

The waste materials are composed mostly of silicates in their mineralogical form of olivine, forsterite and plagioclase, and moderate content of iron oxides.

As a results it was found that the structure, morphology, and some other characteristics of Fly ash particles have been changed significantly after modification and their mixing with Chitosan polymer matrix. The highest thermal stability was exhibited by EAFS-EN because has high content of oxides as: silicate (SiO₂) with participation 53%, that is stable at high temperatures. FA-EN NaOH + Chitosan is the most stable material at higher temperatures. Based on the results of the characterization of the samples with the aforementioned analyses, chitosan is expected to improve the capacity of fly ash particles for the absorption of heavy metal ions. In terms of high thermal stability, natural and abundant availability and low cost, Fly ash/Chitosan composites are suitable as adsorbents for the removal heavy metal ions.

Key words: *adsorption, heavy metals ions, Fly ash, Chitosan*

Effects of various nuclei isolation protocols on the performance of the Comet assay on *Allium cepa* L. root tip cells

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Abstract

Comet assay is widely used method for measuring deoxyribonucleic acid (DNA) strand damage in prokaryotic and eukaryotic cells. However, the application of this test in plants still needs further improvement towards ensuring a sufficient number of nuclei and low DNA damage caused by the experimental procedure. The aim of this research was to analyze the different approaches and techniques of nuclei isolation while applying Comet assay in root tip cells in *Allium cepa* L. in order to increase the yield (number of the nucleoids/comets) and to keep low background levels of DNA damage while applying this assay. For this purpose, it was investigated the effect of each of the following factors: the technique and number of cuts on root tips, prior treatment of the root tips by low temperatures as well as the material (plastic and glass) in which the isolation of the nuclei is performed. The obtained results show that the isolation of nuclei from unfrozen root tips is more suitable (compare to frozen ones) because it gives lower levels of DNA damage. Regarding the yield, it is shown that ten cuts per root (from three roots) gives sufficient number of comets. When the isolation of nuclei was performed in glass Petri dishes, the yield was higher than in plastic Petri dishes showing that glass is more suitable material for isolating nuclei (compare to plastic Petri dishes). The use of PBS and TRIS was not accompanied by any significant difference either in comets yield or in the percentage of DNA damage. Based on the obtained data, the isolation of the nuclei by ten cuts/root on three root tips of onion sets (which have been previously cooled) by keeping them in PBS in glass dishes, presents the most optimal procedure for the higher comet yields and lower levels of DNA damage.

Key words: Comet assay, *Allium cepa*, nucleus isolation

Genotoxicity assessment in blood cells of fish (*Rutilus rutilus*) from Llapi river

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Abstract

Pollution of water resources is one of the major problems in Kosovo. Most of the rivers in Kosovo are found to be highly polluted, thus further reducing the possibility of using this water for the basic needs of Kosovo's citizens.

The Llapi River is also exposed to pollution and therefore, this study aimed to assess the genotoxic effects of the pollution of Llapi River due to various discharges along the river course before the water of this river is discharged into one of the most polluted rivers in Kosovo-Sitnica River.

The test organism in this research was fish *Rutilus rutilus*, whereas the Comet Assay and Micronucleus Test have been used as methods for assessing genotoxicity. These assays are known for their use in assessing the level of the damage caused to the genetic material in cells of living organisms. The study was conducted during the period August-September 2018 and included analysis of genetic material damage (DNA damage and micronucleus frequency) in fish caught in two localities on the Llapi River (Barilevë and Babimoc) and at one sampling point at Batllava Lake (for comparison).

The results of this research work showed differences between localities (in some cases) in the levels of damage to genetic material as well as when comparing August with September (within the same locality). It is worth noting that individuals caught in Batllava Lake incurred greater damage (as shown by Comet assay) than those from the investigated Llapi River localities, while the frequency of micronuclei showed smaller differences between localities.

The results of this research indicate the need for further research (including longer periods) in the Llapi River as well as in Batllava Lake. It is particularly important that future research be accompanied by chemical analysis in order to elucidate the effects found in individuals caught in Batllava Lake.

Key words: *Genotoxicity; Comet assay; Micronucleus test; Rutilus rutilus; Llapi river*

Novel 1,2,3-triazole based benzenesulfonamide derivatives as isoform selective carbonic anhydrase I, II, IX, and XII inhibitors

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Abstract

A novel series of 1,2,3-triazole benzenesulfonamide substituted oxime ether (**6a-n**) inhibitors of human α -carbonic anhydrase (*hCA*) was designed using a tail approach. The design method relies on the hybridization of a benzenesulfonamide moiety with a tail of oxime and a zinc-binding group on a 1,2,3-triazole scaffold. Among the synthesized analogues, the naphthyl (**6m**, K_I of 68.64 nM, S_I of 10.27), and methyl (**6a**, K_I of 56.32 nM, S_I of 11.72) derivatives (over *hCA* IX) and propyl (**6c**, K_I of 95.57 nM, S_I of 2.71), and pentyl (**6d**, K_I of 51.09 nM, S_I of 6.60) derivatives (over *hCA* XII) displayed a noticeable selectivity for cytosolic isoforms *hCA* I and II, respectively. Meanwhile, analogue **6e** displayed potent inhibitory effect versus the cytosolic isoform *hCA* I (K_I of 47.77 nM) and tumor-associated isoforms *hCA* IX and XII (K_{IS} of 195.90 and 116.90 nM, respectively) compared with the reference drug acetazolamide (AAZ, K_{IS} of 451.80, 437.20, and 338.90 nM, respectively). Derivative **6b** showed higher potency (K_I of 33.19 nM) than AAZ (K_I of 327.30 nM) towards another cytosolic isoform *hCA* II. Nevertheless, substituting the lipophilic large naphthyl tail to the 1,2,3-triazole linked benzenesulfonamides (**6a-n**) raised inhibitory effect versus *hCA* I and XII and selectivity towards *hCA* I and II isoforms over *hCA* IX. In the molecular docking study, the sulfonamide moiety interacted with the zinc-ion and neatly fit into the *hCAs* active sites. The tail extension also engaged in various hydrophilic and hydrophobic interactions with the nearby amino acids, which impacted the analogues' potency and selectivity.

Key words: 1,2,3-triazole, benzenesulfonamide, carbonic anhydrase, *in silico* study, oxime

The Relationship Between Work Ethics and Work Performance (Case Study: Workers of MFMC-Prishtina)

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Abstract

This study aimed to assess the relationship between work ethic and job performance. The work ethic is essentially the belief that work is morally good. Ethics also refers to a set of values that are defined and characterized by diligence and hard work. Work ethic can be defined as the inherent ability to work to strengthen character. On the other hand, performance is a behavior exhibited or something done by the employee. Studies in determining individual performance at work show that it relates to work behaviors towards organizational goals. The purpose of this study is to show the relationship between ethics and work performance among health workers in the MFMC. 100 health workers of the MFMC in Pristina participated in this study. The quantitative method was used in the methodology of this study. In this study, two instruments were used, the one that measures work ethics and the instrument that measures performance at work. The findings of this study have shown that there is a significant relationship between work ethics and work performance, also from the results we can see that work ethics have a significant impact on work performance.

Finally, the findings of this study and the practical relevance of these findings to health workers are discussed.

Keywords: *ethics, performance, health worker, relationship*

Total Phenolic, Total Flavonoid and Antioxidant Activity of *Humulus lupulus* L. from wild populations in Kosovo

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Abstract

Hop (*Humulus lupulus* L., fam. Cannabaceae) is an economically important plant species used in traditional and modern medicine and in food industry. It has diverse secondary plant metabolites, including phenolic and flavonoid compounds, demonstrating different biological activities. To assess the natural variation of the total flavonoids, total phenolics and antioxidant activity among wild populations, the female flowers were collected from 21 wild populations in Kosovo. Plant material was dried, and then 150 mg of the grounded female flowers were extracted with 25 ml of 50% MeOH for 30 min. in an ultrasonic bath. Total phenolics, flavonoids, and antioxidant activities (DPPH and FRAP) were determined using spectrophotometric methods.

The total phenolic (\bar{X} and SD) ranged from 31.40 ± 7.04 to 54.15 ± 9.76 mg CAE/100g. The lowest content was recorded in the Deçan locality, while the highest was in Suhareka. Total flavonoid content ranged from 3.10 ± 0.86 (Deçan) to 6.49 ± 1.47 mg CE/100g (Kamenica). According to the FRAP assay, the lowest antioxidant activity was recorded in Deçan (7.36 ± 1.45 mg TE/100g), while the highest was in Kamenica (13.05 ± 3.28). The lowest antioxidant activity was recorded in Deçan (25.13 ± 5.98 mg TE/100g) according to the DPPH assay test, too, while the highest activity was in Lipjan (55.25 ± 14.15). One-way analysis of variance (ANOVA) shows no significant differences in total phenolics, total flavonoids and antioxidant activities (DPPH and FRAP) among the wild population. The Pearson correlation coefficient between total phenolic and total flavonoids and both antioxidant tests shows a significantly positive correlation ($p < 0.01$).

Further investigations based on molecular analysis are needed to assess the natural variability among wild populations of this species in Kosovo. Moreover, profiling and screening of the phenolic and flavonoid compounds are required to evaluate the correlation between specific chemical constituents with their antioxidant activity.

Key words: Hop, antioxidants activity, phenolic, flavonoids.

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Concentration of PM₁₀, PM_{2.5}, NO₂, O₃, SO₂, CO, in the Air of Gjilan

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Abstract

The area where we are researching is not known as an area with established industry, but the main pollution problems are present in the urban area, which is highly contaminated.

Through an analysis based on standard monitoring data, this study attempts to examine the level of pollution in an area that does not have much developed industry. The parameters measured throughout the year 2022 are: SO₂, CO, NO₂, O₃, PM₁₀ and PM_{2.5}, with the unit µg/m³ and for CO mg/m³ and always referring to the directive 2008/50/EC on ambient air quality and cleaner air for Europe and the Law. No. 08/L-025 for Air Protection from Pollution. All the results showed an increase in PM₁₀ and PM_{2.5}, compared to the other pollutants, especially in the winter season, while in the summer season we have an increase in O₃.

Key words: air, pollution, contamination, industry, measurement.

Comparative analysis of tourism policies between the Republic of Macedonia and the Republic of Kosovo

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Abstract

Tourism today is among the largest industries in the world, creating more jobs than most other sectors. Countries that are in the early stages of tourism development, such as Macedonia and Kosovo, have opportunities to benefit from tourism, especially in increasing economic development. For tourism to flourish sustainably, public institutions must provide an institutional framework that is favorable for the development of the private sector, as well as guarantee quality assurance for tourists. This includes appropriate infrastructure, promotion of tourism potential, good transport, visa facilitation and appropriate policies to stimulate demand growth, or in other words the design and implementation of tourism policies and strategies. This paper aims to provide information about policymaking in Tourism. In this study, an analysis is made of the extent to which these tourism policies are in Macedonia and Kosovo, as well as their comparison. Through the comparative method, we have compared the results of the tourism policy of one country to be applied in another country and vice versa, so in our case the results of the tourism policy of Kosovo and Macedonia have been compared. From the results, we understood that both countries have a similar tourism policy. The evolution of policies in tourism is more pronounced in Kosovo than in Macedonia, the policy process has advanced more in Macedonia than in Kosovo. Both countries have tourism development policies in the dimensions of cooperation between actors in tourism, cluster, innovation, human resources or even sustainable development, knowledge and training for strategy and its content in tourism, etc.

Keywords: *tourism policy, Macedonia, Kosovo, tourism, economic development*

Polarographic investigation of Pb(II) complexation with NTA and EDTA in salicylate solutions

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Abstract

Modern electrochemical research promotes much environmental water chemistry. Sensitive voltammetric techniques are very useful for the presence of metals in natural waters, dominated by complexation with organic compounds. The determination of stability constants of metal ion complexes with different ionic species present in natural waters is still the interest of many environmental electrochemists. This paper aims to investigate the Pb(II) metal complex with the organic ligand. We have investigated the complexation of lead ion Pb(II) with ethylenediaminetetraacetic acid (EDTA) and nitrilotriacetic acid (NTA) using differential pulse polarography.

During experimental work, we observed that ionic Pb(II) with complexing agents in salicylate solutions presents well-defined waves. Based on the results presented in this paper, we can conclude that labile Pb(II) salicylate complexes have a very large influence on the formation of Pb(II)NTA complexes. In contrast, this influence is much smaller in the Pb(II) EDTA complexes. Also, the concentration of salicylates and the pH value have a great influence on the degree of complexation of ionic Pb(II).

Key Words: Lead, complexation, salicylate, NTA, EDTA

Thermophysical properties of isobutanol + cyclohexane, isobutanol + benzene, and cyclohexane + benzene mixtures

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Abstract

Experimental densities, sound speeds and refractive indices at 298.15 K are reported for the binary liquid mixtures isobutanol + cyclohexane, isobutanol + benzene and cyclohexane + benzene over the entire range of compositions and under atmospheric pressure. From these experimental data, the excess molar volumes V^E , excess isentropic compressibilities $\Delta\kappa_S$ and deviations in molar refractivity ΔR were derived and fitted by the Redlich-Kister polynomial to determine the adjustable fitting parameters and the standard deviations. The ternary data were compared with the prediction values using the Toop, Tsao-Smith, Rastogi and Kohler binary contribution models. The variation of V^E , $\Delta\kappa_S$ and ΔR with composition has been interpreted in terms of molecular interaction between the components of the mixture and structural effects.

Key words: Aromatic compounds, Alkanols, Density, Sound Speed, Refractive indices.

The Ecological Risk of Contamination with Toxic Metals, in the Soils around the "Trepça" Complex, the "Kosovo" Thermal Power Plants and the New Ferronickel Complex.

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Abstract

Samples of toxic waste, soil and river water, were collected in the landfill (solid environmental hot-spots) near the "Trepça" Complex, "New Ferronickel" and Kosovo "Thermal Power Plants", and analyzed by the ICP-OES method, (Inductively Coupled Plasma-Optical Emission Spectroscopy) to measure the concentration of 11 toxic metals (Pb, Cd, Cr, Ni, Zn, Cu, Hg, As, Co, Mn, and Fe). The pollutant with the highest mean concentration was Fe (36400.00mg/kg), followed by the Mn (8683.00 mg/kg), Cr (6575.00 mg/kg), As (4739.00 mg/kg), Pb (3364.00 mg/kg), Zn (2394.00 mg/kg), Ni (922.60 mg/kg), Cu (297.60 mg/kg), and Co (46.60 mg/kg). To analyze the level of heavy metal pollution in an area, more than one pollution index analysis is needed, so in this study 4 pollution indices were used, namely the geoaccumulation index (Igeo), contamination factor (CFi) the degree of modified contamination (mCd) and the Pollution Load Index (PLI). CF values indicate that all values for Fe, Mn, Cr, As, Pb, Zn, Ni, Cu, and Co in all samplers, indicate a high degree of contamination. In all soil samples, the values PLI indicate the presence of soil pollution. In according average values for Igeo for all toxic metals are > 5, it can be concluded that the soil belongs to the class "extremely polluted". In accordance with the obtained results, it is necessary to prioritize the work on sustainable solutions to mitigate the current risks.

Key words: Trepça, Ferronickel, Thermal Power Plant, toxic metals, ecology risk.

Impact of PM_{2.5} and PM₁₀ on air quality in the Municipality of Obiliq

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Abstract

The purpose of this study was to determine the PM_{2.5} and PM₁₀ dust particles in the air quality in the Municipality of Obiliq. As an industrial area, the municipality of Obiliq is the municipality with the most polluted air in Kosovo, due to the two power plants located there and the low-quality coal used as fuel by the two power plants "Kosova A" and "Kosova B". In addition to thermal power plants, coal is also used in household for heating. PM consists of a multicomponent matrix originating from various anthropogenic sources (energy production, household, traffic, etc.) and natural sources (biomass burning, dust, etc.) which are subjected to several atmospheric processes.

Chronic exposure to particulate matter (PM) contributes to serious health effects, such as: accelerated aging, loss of capacity and decreased lung function, development of diseases such as asthma, emphysema, bronchitis, lung cancer, as well as heart diseases and strokes as the main causes of death.

Measurements of PM_{2.5} and PM₁₀ dust particles for this study were made in real time for twelve months of 2020, based on directive 2008/50 for clean air in Europe.

The device used to measure PM_{2.5} and PM₁₀ dust particles is Gravimetric optical Measures (GRIMM M180), which works according to the standard method: EN 12341:1999 and EN 14907:2005

Based on the data obtained from this research, the highest concentration of PM₁₀ was 107 µg/m³, while the maximum value allowed according to directive 2008/50 is 50 µg/m³. While the maximum value of average per hour e PM_{2.5} has reached up to 187 µg/m³, while the maximum value allowed according to directive 2008/50 for clean air in Europe is 25 µg/m³.

From this research we come to the conclusion that the air pollution in that area is the result of two outdated power plants operating in that area for the production of electricity, as well as the use of low quality coal that is used as a fuel.

Key words: *air pollution, power plants, coal, Municipality of Obiliq, exceeds.*

Assessing the implication of the Global Mega Trends in the Kosovo Integrated Water Management

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Abstract

Kosovo adopted a wide environmental legal framework where the primary legislation has been complemented and, in some cases, repealed by new environmental laws that continue to envisage incorporation of the EU environmental *acquis*. However, the weak implementation is considered to be at the root of weak practices that are openly carried on in most of the territory of Kosovo such as the **poor implementation of water resources management**, functions, etc. In this regard, Kosovo is still suffering from a lack of enforcement and compliance with the laws.

This paper aims to address the science-policy interface and bring together evidence that develops systemic co-created knowledge and at the same time support policymaking and decision-making at the Kosovo level to solve the environmental tackling issues. At this time, it's essential to have an adaptable, sustainable application solution that for example global megatrends bring to support the change and future of our society. In this regard, the EEA/ETC method toolkit has been used to define the capacity and expertise in foresight as a streamlined process needed to help Kosovo to consider the implications of global megatrends (GMTs) and prepare outlook information related to water management. For the case of Kosovo, two global megatrends have been chosen for assessment: GMT 7: Intensified global competition for resources and GMT 9: Increasingly severe consequences of climate change. Both proposed methods are participatory in focus and use a systematic approach that needs evidence to prioritize potential impacts on natural resources and climate change in Kosovo. Further, the GMTs implications and relevance showed the need for strengthening policy measures in accordance with national priorities and circumstances.

Key words: *global megatrends, environmental foresight, integrated water management.*

Assessing environmental sustainability in Kosovo using Multilevel Perspective (MLP) approach

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Abstract

Environmental quality and sustainability of natural resources, global ecosystems, biospheres as well as the human living environment have become a central concern for society and politics in recent years. Most environmental problems have their roots in human behavior, whereas the present generation bears the burden of past actions and current responsibilities towards the environment. In assessing environmental sustainability a **Multilevel Perspective** (MLP) approach has been used as a fruitful middle-range framework for addressing environmental innovation and sustainability transition through interactions between policy/education/citizens in the field of technology, economics, and business aspects of the demand side. The paper through in-depth analysis and a multidisciplinary collaborative approach will provide a reasoned mapping and broad understanding of socio- and geopolitical factors influencing citizen engagement on climate action on the path of the green and digital transition of society.

The analyses confirmed that the application of MLP presents the niche-regime-landscape interactions sustainability transitions and determines their scope and impacts. A mixed methodology approach was adopted for the study, with quantitative and qualitative techniques utilized to collect primary and secondary data. The results show that the MLP elements are required in order to provide an understanding of environmental problems and foster green transitions. Therefore, the applicability of MLPs in Kosovo seems more appropriate to analyze technical innovation based- on environmental systems.

Keywords: *Multilevel Perspective, environmental, sustainability.*

2. Agriculture and Food production



Assessment of implementation of biosecurity measures in livestock farms in three regions of Kosovo

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Abstract

Biosecurity is a multicomponent procedure that encompasses risk analysis and management strategies relevant to human, animal and plant life, as well as risk assessment related to the environment.

The aim of this research was to assess verified data related to biosecurity measures that are implemented by farmers in cattle, sheep and goat farms in Kosovo. Knowledge of a farm's biosecurity level is required to evaluate if and where improvement is needed, and it is useful for future animal disease risk assessments. The level of implementation of biosecurity measures in livestock farms directly affects food safety and quality.

A total of 36 farms from three regions of Kosovo, Pristina, Ferizaj and Peja were included in this research. A questionnaire consisting of one open-ended question and 37 closed questions was administered directly to farmers, and the current on-farm situation was observed by the investigators. Based on the collected results, 86% of farms were multi-species livestock farms, 8% were sheep farms, and 6% were goat farms. Among all the farms visited, 67% of them operated with a combined system, 28% with a closed system and only 5% operated with an open system. The vast majority of participants (81%) declared that they did not have sufficient knowledge about the term biosecurity, whereas 11% of them were moderately familiar with the term biosecurity and only 8% of them were quite familiar with the term. Out of all respondents, 83% reported that their animals go through a veterinary health check only when necessary. Other biosecurity measures which were applied less frequently included: showering before entering the farm, specific clothing and shoes for visitors, animal quarantine, and systematic plan for insect and rodent control. Farmers admitted that there is room for improving the level of biosecurity on their farms, but indicated the need for practical information and financial support from local institutions. We conclude that routine integration of biosecurity measures is not demonstrated by most local farmers in their management practices and that the level of biosecurity in Kosovo has a tremendous opportunity to be improved.

Key words: *on-farm biosecurity, food safety and public health.*

Legume germplasm exploration and collection in Korça region

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Abstract

Legumes and pulses have played a prominent role in human and animal diets, sustainable crop production and in fostering biodiversity-based agriculture, but their wide biodiversity was not sufficiently valorised. Their genetic diversity is needed to sustain the human food supply and security. Korça region is rich in legume genetic resources, however, as well as in other areas of Albania, there are still areas where only cursory collecting or no collecting has been carried out of their traditional varieties. Many legume local varieties are still cultivated in Korça region, as farmers due to agronomic, culinary, or quality preferences as well as locally important cultural values prefer these crops, but an unknown number of landraces have irremediably lost over the past 30 years. This paper focuses on the outputs of collecting expeditions of local legume germplasm for their conservation to avoid extinction due to genetic erosion and because of climate change. Survey and collection of legume germplasms was executed during 2021-2022. Significant diversity in the species' local germplasm was revealed. In all, 56 seed samples of accessions in ten legume crops were collected. The legume collection includes accessions of common bean, runner bean, green common bean, pea, cowpea, chickpea, pea, grass pea and fenugreek. Local legume crop accessions collected may help to conserve diversified legume accessions and protect them from genetic erosion. Such germplasm would be useful to study resistant cultivars to adverse climatic conditions to cope with the changing climate.

Key words: *legumes, local varieties, genetic resources, common bean, blue fenugreek.*

Pectin depolymerization by UV/TiO₂ under different conditions

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Abstract

Pectin oligosaccharides (POS) are suggested as novel candidates of prebiotics. This work deals with depolymerization of pectin using UV light/TiO₂ under different temperatures and pH. Furthermore, the individual contribution of TiO₂ and UV light on the overall pectin depolymerization is evaluated. The solution of pectin is prepared by mixing lemon peel powder pectin with distilled water in magnetic stirrer. Subsequently, samples were characterized for the content of mono-, oligosaccharides and uronic acids by HPAEC-PAD. The highest content of galacturonic acid turned out to be at 50°C in alkaline media. GalA can be further applied as a strong prebiotic agent instead of commercial prebiotics such as fructooligosaccharides, galactooligosaccharides.

Key words: *UV light, TiO₂, pectin, temperature, pH.*

The Influence of the Packaging Colour on the Consumer Cheese Choice in Kosovo

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Abstract

When it comes to food, the colour of the packaging often influences the choice of the same product, regardless of the price. Thus, the objectives of the current study were to see how much knowledge consumers in Kosovo have about cheese as a product, but most importantly, to see how the consumers are influenced by the packaging colour. An online questionnaire survey that contained 17 questions in total was shared through social media from December 20, 2022, to January 23, 2023, and people from the age of 12 had the right to respond. One of the questions had the same price but different colours of packaging (red, orange, yellow, and green), and the other question had different prices and also different colours of packaging (red, orange, yellow, and green). Consumers preferred red colour packaging when cheeses had the same price (73% of cheese consumers) followed by green and orange colours (10.4% respectively 10.2%). Regarding products price the red packaged cheese was the most expensive 2.60 € and was preferred by 67.1% of the cheese consumers followed by the green colour packaging which was the cheapest 2.45€ (14.3%). According to the results of 804 respondents (95.4% of whom were cheese consumers) from the two questions, it is clear that consumers like purchasing red packaging and yellow packaging was the colour of packaging that was least frequently selected in both questions. In conclusion, consumers are more influenced by the packaging colour more than the price and quality of the product.

Key words: *cheese, packaging colour, red, Kosovo*

Influence of Packaging Material on Bread Texture during Storage

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Abstract

Every meal includes bread in our country due to its widespread consumption. Wheat-based bread is most frequently consumed by the populace. Bread from bakery is usually bought in plastic or paper bags. This aim of this work was to evaluate the influence of packaging material in bread by analyzing their textural properties at 25°C during storage. The study was done in the University of Mitrovica "Isa Boletini", in May 2022. For measurement of texture was used compression test. In this study, two loaves of wheat-based bread (500g each) were bought from the bakery, the same production line, cut into thin slices evenly and packed in paper and plastic bags. The results showed that packaging material affects bread textural properties during 4-day-long storage. The bread packed in paper and plastic bags showed similar textural characteristics after 24h of storage. Plastic packed bread showed better results during 4-day-long storage for the properties evaluated through the compression test (hardness, chewiness, resilience, adhesiveness, springiness). The force required to compress the plastic packed bread was lower resulting in softer crumb. In conclusion, according to the obtained results, the packaging of bread in plastic bags preserves the structure of the bread and therefore its quality better than bread packed in paper bags.

Key words: *Texture parameters, bread, paper bag, plastic bag.*

Multi-crops germplasm exploration and collection from Korça region

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Abstract

The Korça region is one of the richest areas of Albania for diversity of staple crops. It has historically been rich in agrobiodiversity, including crop landraces valued for their agronomic, nutritional and culinary qualities, as well as locally important cultural values. The genetic erosion of crop landraces has increased over time, particularly past the 1990s, due to the push towards new high yielding modern varieties, the change in agricultural techniques, the lack of policies to protect landraces from competing commercial varieties, drifting away of the younger generation from agriculture and other factors. At the same time, the conservation of crop landraces has not been a priority for local authorities and actors, and initiatives to conserve local genetic resources have been limited. Nevertheless, landraces continue to be cultivated by farmers in Korça region for their unique values and societal functions and services. This study was undertaken to explore and collect crop landraces to initiate an ex situ conservation programme in community seed bank. Exploration for collection of multi-crop germplasm diversity was carried out during 2021-2022. A total of 79 landrace accessions belonging to 12 species of crops were collected during exploration missions. Greater diversity was found in maize, followed by pumpkin, tomato, melon, onion and cucumber. This study highlights information on the germplasm explored and collected and threats leading to genetic erosion in the studied area.

Key words: *Conservation, exploration, landrace, multi-crops germplasm.*

Acaricide treatment against *Varroa destructor* mites: a comparative study

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Abstract

Nowadays, high invasion by *V. destructor* is one of the main factors for occasional bee colony losses in some regions of Europe and the world. The aim of this study was to compare the effectiveness of treatment methods against the Varroa mites with Acaricide and organic formic acid. The research was conducted in the period 2021-2022 on an individual conventional apiary stationed in the mountainous area of the city of Bitola, Northern R. Macedonia. The bee colonies are an indigenous population of honey bees in the region, *Apis mellifera macedonica*. Bee families treatment with Acaricides (spring and autumn treatment) was carried out in two groups (2 groups x 7 bee hives were treated with Amitraz and Formic acid, respectively and 1 group of 7 hives was a control group without treatment). A performance test was conducted for the assessment of traits such as colony strength, honey yield, expression of defense and swarming behavior. Treatment with formic acid, if carried out according to the prescribed measures, has proven to be an effective organic method in the Varroa reducing population. This results confirm a significant contribution of Varroa control, which will determine the application of the field study with a strong emphasis on the use of organic acids.

Key words: *Varroa destructor*, Organic acids, Amitraz, Acaricide, Treatment

FTIR spectroscopy structural analysis of the interaction between Milk Lipids and metal ions

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Abstract

FTIR spectroscopy was used to structurally characterize the interaction of triglycerides present in milk with metal ions (Zn^{+2} , Fe^{2+} and stainless steel Cr/Ni). The milk composition was determined by Lactoscan SL60 for monitoring milk composition including the percentage of fat, protein, solids non-fat, lactose, ash and density (g/cm^3) which all of them are changed in the samples with metal ion presence. The infrared spectra indicate that the metal/lipid interaction occurs mainly through the carbonyl groups of the ester and the olefin double bonds which indicate occurring of the lipids peroxidation especially initiated from metal as a pro-oxidant.

FTIR vibrational bands such as ratio of intensity peaks 3473/2854, 1745/2854 and 3010/2854 as important biomarkers for monitoring of the trend the lipid peroxidation in milk fat. However other possibility for better understand the interaction of ion metals with lipids in pure fat milk was monitored and by first and second derivative vibrational Spectroscopy.

As a result, it is revealed that heated milk with different ion metals has significant chemical transformations and decompose of lactose, fat and protein compare with pure heated milk with minor changes which is in correlation with lipid peroxidation in same samples. Lipid peroxidation occur in interaction between lipids an metal ion as pro-oxidant it is crucial initiate reaction for next changes which occur in milk composition.

Key words: ratio intensity, milk fat, FTIR Spectroscopy, lipid peroxidation.

Distribution of canine leishmaniosis in Kosovo dogs based on region, gender, age, and breed

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Abstract

Canine leishmaniosis is a zoonotic disease caused by a parasite of the genus *Leishmania* that is transmitted by Phlebotomine sand flies. *Leishmania infantum* is the species responsible for a zoonotic form of the disease where dogs are reservoir hosts. This study was conducted in 2021 and 2022 in all seven regions of Kosovo to determine the distribution of canine leishmaniosis and to assess the role of different variables such as region, gender, age, and breed in its spread. The sera collected from stray dogs, farm dogs, and private household dogs were serologically examined by enzyme-linked immunosorbent assay (ELISA) and confirmed by an indirect fluorescent antibody test (IFAT). All variables were measured and compared. Based on the distribution by region, the Prishtina region had the highest rate of seropositive dogs at 8.0% (4 out of 50), followed by the Prizreni region at 5% (2 out of 40), Ferizaj region at 5% (2 out of 40), Gjakova region at 5.0% (2 out of 40), Peja region at 2.86% (1 out of 35), Gjilani region at 2.5% (1 out of 40). All samples from the Mitrovica region tested negative (0 out of 40). Of 141 males and 144 females included in the study, only 8 males and 4 females were positive. The age variable was significant as all 105 dogs under 3 years of age were negative, whereas the dogs between 3-4 years of age were 3.33% seropositive, 4-6 years of age were 8.96% seropositive, and the dogs older than 6 years were 7.55% seropositive. The breed variable did not have any significant impact. Only 4 pure breed dogs out of 109 were seropositive (3.67%), whereas, from 176 mixed breed dogs, only 8 were seropositive (4.55%). The present study confirmed that canine leishmaniosis remains endemic in Kosovo, and poses a public health risk. These results emphasize the need for stronger surveillance and control of this zoonotic disease.

Key words: *Leishmania infantum*, dogs, distribution, Kosovo.

3. Medical/Health Science



Polyunsaturated Fatty Acid and Sphingolipid Vasodilatory Effects in the Inferior Abdominal Vena Cava

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Abstract

Omega-3 fatty acids, specifically EPA have been reported to have cardioprotective effects and modulation of various vascular beds, including human veins, and also lower risk for venous thromboembolism, positive impact on chronic venous leg ulcers. Sphingolipids have an important role in cardiovascular diseases and modulation of vascular tone through sphingosine-1-phosphate receptors (S1P). However, little is known about the effect of the direct effect of EPA and FTY-720 on the venous tone, specifically the abdominal Inferior Vena Cava (IVC). We aimed to investigate the direct effect of EPA and FTY-720 on the rat isolated Abdominal Inferior Vena Cava (IVC).

Abdominal IVC was isolated in small segments from Wistar rats at 350-400 g and prepared for the tissue organ bath apparatus. The direct vasodilation effect of EPA (100 μ M) was tested in venous tissues precontracted with Thromboxane A2 agonist (TxA2), u46619 100 nM in the absence or the presence of the non-selective inhibitor for K⁺ channels, tetraethylammonium chloride (TEA) at concentrations of 10mM. Endothelin-1, 1nM was used as an additional constrictor. The vasodilation effect of FTY720 (1-30 μ M) was investigated after precontraction with endothelin-1 at 1 nM in the presence or absence of eNOS and cGMP inhibitors: L-NAME (100 μ M) and OQD (10 μ M).

EPA has given relaxing activity in abdominal IVC with ($E_{max}=89.73\pm6.65$) with $n=5$. The relaxing capacity were reduced significantly in the presence of the TEA 10 mM ($E_{max}=47.50\pm4.01$, $p<0.001$). Moreover, EPA has shown vasodilation activity in the veins precontracted with ET-1 as well but with a lower magnitude. FTY720 has shown vasodilation in the inferior abdominal cava vein tissue with $E_{max} 63.95\pm5.42$ with $n=6$ and such effects were diminished after inhibition of NO-dependent pathways.

EPA has shown vasodilation action in isolated abdominal IVC in both thromboxane A2 agonist and Endothelin-1. This effect is likely to involve the K⁺ channels. FTY720 has shown dose-dependent vasodilatation responses on the inferior abdominal vena cava and such responses were mainly NO-dependent suggesting its impact on the venous tone activity and possible impact on systemic cardiovascular actions or protective effects in inferior vena cava syndrome.

Key words: EPA, FTY-720, cardiovascular system, inferior abdominal vena cava, vasodilation.

Breastfeeding is against childhood asthma: literature review

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Abstract

The aim of this research is to investigate the relationship between exclusive breastfeeding and the development of asthma in early childhood.

A systematic review was conducted with PubMed and Cochrane library source databases using the PICO model (PICO process). Retrospective/prospective cohorts in children aged <6 years with exclusive breastfeeding exposure reported were included. A primary outcome was presentation of asthma before the age of 6 years old. A secondary outcome was the effect of breastfeeding combined with formula or children who were not breastfed.

25 studies met inclusion criteria. 21 studies reported that children who were not exclusively breastfed or not breastfed at all had a higher risk of asthma. 4 studies reported that breastfeeding was not protective to asthma. Most of the studies showed that there is a limit of 4 months of exclusive breastfeeding for it to be protective.

The findings suggest that children who are exclusively breastfed for at least 4 months of their neonatal life, are associated with a lower risk of early childhood asthma (<6 years old).

Key words: *Breastfeeding, Childhood asthma*

The Relationship between Big Five Personality Traits, Coping Strategies, and Emotional Problems through the COVID-19

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Abstract

Considering the impact of pandemic condition on mental health and functioning in daily life, the main purpose of this study was to investigate the relationship between personality traits, coping strategies and emotional problems such as symptoms of depression and anxiety during the COVID-19 pandemic period. Specifically, the purpose of this study is to create a model of the impact of coping strategies as mediating factors in the relationship between personality traits and emotional problems. For the purposes of this study, a sample of 200 Kosovar respondents was used, where the age of the participants varies from 18-54 years. As a result of the pandemic situation created, the method of data collection for this study was done in the form of self-reporting, divided into physical questionnaires and online ones. The BFI Personality Inventory is used to classify personality traits, the Coping Control Checklist (WCCL) to classify coping strategies, and the Adult Self-Reporting Questionnaire (ASR) used to identify various symptoms of emotional problems. The design of this study is correlative, as it tends to understand the interrelationship between variables. The analysis of the results in this study was done by means of the statistical package of SPSS and program R. After the analysis, it is seen that there is a significant correlation between personality traits (extraversion and neuroticism) and coping strategies (seeking social support and avoidance), as well as there is a correlation between personality traits (compliance and neuroticism) and emotional problems (symptoms of anxiety and depression). An association was also found between coping strategies (avoidance) and emotional problems (anxiety symptoms). As for gender differences in experiencing anxiety symptoms and using desired thoughts as coping strategies, it was found that women are more predisposed to experience anxiety symptoms and use desired thoughts, than men. This study suggests that social and psychological welfare institutions can develop targeted action plans to support individuals with different personality traits in managing the emotional impact of crises such as the COVID-19 pandemic. By tailoring interventions to individuals' personality traits, institutions can help individuals build resilience and develop effective coping strategies, promoting greater emotional well-being during times of crisis.

Keywords: *personality, coping strategies, emotional problems, COVID-19, BFI.*

Necessity for an organic toothpaste in Kosovo

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Abstract

There are so many different kinds of toothpaste available that choosing the best one for your dental health requirements can seem difficult. Most of the products contain chemicals like fluoride. There is a tendency in producing toothpastes using natural compounds like herbal plants. Organic toothpaste's capacity to eliminate bacteria and improve breath without the use of chemicals makes it desirable to people, particularly to parents. The objective of this study was to understand the need for an organic paste in the Kosovo market and reasonable price for this toothpaste. Data collection was done using a questionnaire which was shared online to respondents, who were chosen at random and were of various ages, as the technique of data collecting. In total 822 responses were gathered for this study. The main question was would you buy organic toothpaste if it was at a higher price than other toothpastes? To understand the price target, question was how much do you think would be a reasonable price for an organic toothpaste? Based on the data 68.2% are willing to buy organic toothpaste at higher price, 21.4% don't know and 10.3% won't buy. The reasonable price for an organic, healthy and suitable for all ages toothpaste was variable as 34.3% were willing to pay 2 € but 25.8% only 1.5 € compared to a non-organic toothpaste costing under 1 €. We have concluded from our research that there is a sizable market need for an organic paste that can be produced at a competitive price.

Keywords: *Toothpaste, Consumer behavior, Organic, Kosovo.*

Prevalence and determinants of anxiety and depression in parents of children with hemato-oncological diseases in UCCK - Prishtina

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Abstract

Anxiety and depression in parents of children with hemato-oncological diseases often go undetected by doctors. Early attention to the symptoms of anxiety and depression can help prevent the clinical progress of anxiety and depression disorder in parents, which would negatively affect the emotional state of the child, making hemato-oncological treatment difficult.

The aim was to evaluate the prevalence and identify the determinants of anxiety and depression among the parents of children with hemato-oncological diseases, in UCCK - Pediatric Clinic - Department of Hemato-oncology

This cross-sectional study was carried out in a sample of 40 parents, 20 parents of children in the acute phase and 20 parents of children in the remission. Parents of children aged 1/2-18 years of both gender were included, where comparisons were made between the two groups in terms of the prevalence, anxiety and depression intensity, in two different stages of the disease treatment. The sociodemographic data variables were collected, BDQ and the BURNS AQ were administered.

The largest percentage of parents were female in 72.5% of cases, age group 36-45 in 42.5% of cases, 67.5% lived in urban residence and 80% in average socio-economic status, while 40% were with primary education.

The most frequent diagnosis was acute lymphoblastic leukemia in 62.5% of cases. The largest number of parents 45% have shown severe anxiety, while 40% have shown moderate depression.

No significant differences were found in terms of the level of symptoms at the beginning and the end of the treatment, the symptoms were continuously present in both groups. Significant differences were found regarding gender, where the female gender showed a higher level of anxiety and depression, as well as younger parents in terms of age. No differences were found regarding other sociodemographic factors.

The identification of the presence of anxiety and depression in parents of children with hemato-oncological diseases will influence healthcare professionals to pay more attention to the psychological aspects of the experiences of family members of children with hemato-oncological diseases, providing psychological and psychiatric support, to enable further psychotherapeutic approaches.

Key words: *anxiety, depression, hemato-oncological disease*

The Relationship between Personality Traits, Resilience and Somatic Symptoms through the Covid-19 Pandemic

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Abstract

The Covid-19 pandemic has significantly affected the emotional, mental and behavioral sphere endangering the psychological well-being of individuals. The aim of this study, therefore, is to examine the relationship between personality traits according to the Big Five model with resilience and somatic symptoms, with a focus on the local context during the COVID-19 pandemic period. Specifically, the aim of the study is to create a model in which the relationship and influence of personality traits on somatic symptoms is described, mediated by resilience. For the purposes of this study, a total sample of 200 respondents from the Kosovar population, aged 18-59 years, was used. The method used in this research is the survey method, through self-report questionnaires. Due to the pandemic conditions in Kosovo, data collection was carried out in two methods, in physical form and in online form through google forms. Personality Inventory (BFI), used to classify personality traits, Short Residence Inventory (BRS), used to measure respondents' level of resilience, the World Health Organization (WHO) Welfare Index (WHO-5) is used to measure the general psychological well-being of the respondents, while the Adult Self-Reporting Questionnaire (ASR) was used to identify the somatic symptoms of the respondents. This research is quantitative with correlational design. The results of this study were analyzed through the Statistical Package for Social Sciences (SPSS) and the statistical program R. The study presents a significant correlation between personality traits such as extraversion and neuroticism with resilience and somatic symptoms. At the same time, this research presents a significant correlation between the construct of resilience and somatic symptoms. The study also provides data on gender differences in the level of resilience, with men reporting a higher level of resilience than women. The findings of gender differences in the level of resilience during the pandemic period could be useful in developing targeted interventions for men and women to enhance their resilience. For example, interventions aimed at enhancing resilience in women may need to be designed differently from those aimed at men. Personality traits, such as extraversion and neuroticism, play a role in the level of resilience and somatic symptoms experienced during the pandemic period. This suggests that interventions aimed at enhancing resilience and reducing somatic symptoms could be tailored to individuals' personality traits. The significant correlation between resilience and the general level of psychological well-being suggests that enhancing resilience could be an effective strategy for promoting psychological well-being during the pandemic period. Overall, these practical implications suggest that interventions aimed at enhancing resilience could be an effective strategy for promoting psychological well-being and reducing somatic symptoms during the pandemic period. Tailoring these interventions to individuals' personality traits and considering gender differences could potentially increase their effectiveness.

Keywords: *Personality, Resilience, Somatic Symptoms, BFI, Covid-19.*

The study of lifestyle of students of the University of Prishtina “Hasan Prishtina” (Kosovo)

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Abstract

A healthy lifestyle is a way of living that lowers the risk of serious illness. Students have a big risk of choosing an unhealthy lifestyle that leads toward illness and death.

Research goalsof this study was to evaluate student’s lifestyle of University of Prishtina “Hasan Prishtina”, and to define if there is a significant difference depending on gender and faculty; (3) to analyze the presence of negative habits among students (smoking, alcohol and drugs).

In this cross-sectional study, 320 students from 5 different Faculties of University of Prishtina “Hasan Prishtina” participated: Faculty of Medicine, Faculty of Electrical and Computer Engineering, Faculty of Natural Sciences and Mathematics, Faculty of Economics and Faculty of Education. Data were collected by self-administrated questionnaire in Albanian language, with 26 questions about eating and drinking habits, smoking, drugs, physical activity, ways they spend time, stress and depression. Microsoft Excel 2010 and SPSS v.23 were used for data analysis.

Participant’s mean age is 20.9 years (SD \pm 2.1). Only 2.07% of students are obese (BMI \approx 22.45 kg/m² (SD \pm 3.07)). About 33% of students consume sweets several times per day. Prevalence of smoking is 7.9%, alcohol use 7.9%, while drug use 1.03%. Results show that 39.3% of students are inactive and don’t do any physical activity. The mean value of stress is 5.95 (SD \pm 2.17) and the main reason for stress are exams 88.62%. The average time of sleep among participant students is 7.01 hours/day, while 35.99% of students declared that they learn 4-5 hours/day. Students of the Faculty of Medicine have a more sedentary life compared to students of other faculties.

Student’s lifestyle from University of Prishtina “Hasan Prishtina” is relatively healthy. There is a significant difference depending on gender and faculty in some cases. Students from University of Prishtina “Hasan Prishtina” have lower levels of negative habits compared with other European and world countries in general.

Key words: Lifestyle, students, nutrition, physical activity, smoking.

Cardiovascular biomarkers in post-COVID syndrome: literature review

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Abstract

Post-Covid syndrome (PCS) is a new chronic condition, where COVID-19 symptoms persist for weeks to years after diagnosis, despite negative PCR tests. It is characterized by fatigue, coughing, memory loss, breathing difficulties among many, and as any chronic disease, it reduces the patient's quality of life. Since there is no clear information on PCS's pathophysiology, management of the condition is difficult both for the doctor and the patient. In order to make PCS management easier, proper biomarkers are needed. Biomarkers are objective signs that can be measured; they are a scientific indication of the patient's health, and therefore are crucial for the research, diagnosis, monitoring and treatment of the disease. With this literature review we aim to evaluate potential cardiovascular (CV) biomarkers associated with post-COVID syndrome, which will hopefully make PCS management simpler.

This systematic literature review study was conducted based on the methodology of PRISMA reporting guide using the PICO model. We have included studies from PubMed and Cochrane Database of Systematic Reviews – all except for abstracts, editorial letters and case reports. From 211 papers identified, we narrowed down to 10 papers which gave us two major cardiovascular biomarker groups – imaging and molecular biomarkers.

The results show that important imaging CV biomarkers for long-Covid seem to be electrocardiography (EKG), echocardiography (ECHO) and cardiac magnetic resonance (CMR), while important molecular CV biomarkers appear to be, among others, biomarkers of endothelial cell activation and hypercoagulability, high sensitivity troponin, N-terminal pro brain natriuretic peptide (NT-proBNP) and interleukin-8. Of special importance are angiotensin-1 (ANG-1) and P-selectin (P-SEL).

Although current data seems relevant for clinical use, in many cases it fails to demonstrate the responsible pathophysiological mechanisms. Therefore, there is a need for the design of basic studies to understand in more detail the pathophysiology responsible for the appearance of long-Covid symptoms, as well as a need for more research that would bring to light new CV biomarkers and concrete recommendations for their usage in objective examination of PCS patients.

Key words: long-Covid, post-Covid syndrome, biomarkers

Quercetin Prevents Hyperoxia-Induced Lung Inflammation

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Abstract

Prolonged oxygen exposure and positive pressure ventilation of preterm neonates result in the development of bronchopulmonary dysplasia (BPD), a chronic lung disease characterized by lung inflammation, remodelling, and airway reactivity. Unfortunately, the therapeutic options still today are limited. Quercetin is known to have anti-inflammatory and antioxidant properties in different diseases, however, it is not clear about its effects on BPD. In this study, we investigated the effects of quercetin in a rat pup model of BPD. We hypothesize that the supplementation of rat pups with quercetin prevents the lung inflammation induced by hyperoxia. At P4 rat pups were assigned either to ambient air (AA) (21% O₂)- or hyperoxic ($\geq 95\%$ O₂) groups and exposed for seven days. During this time, animals were supplemented daily with quercetin (15 mg/kg of body weight; i.p.) or saline as vehicle. After exposure time animals were euthanized and lungs were harvested, and processed for biochemical and immunohistochemistry studies. Pro-inflammatory cytokines levels (IL-1 β and TNF- α) were measured in whole lung homogenate using the ELISA method. Immunostaining for T-lymphocyte marker (CD3), B-lymphocyte marker (CD20), and CD45 was performed on 5 μ m lung sections.

In the lung tissue of the hyperoxic group of animals, the levels of IL-1 β and TNF- α were increased significantly ($p < 0.01$) compared to AA group. Supplementation of hyperoxic animals with quercetin prevented this increase of IL-1 β and TNF- α , while did not change in AA animals. In lungs of hyperoxic animals, there was an abundance of CD3, CD20, and CD45 stained cells compared to the lungs of ambient air-exposed pups. Supplementation of hyperoxic animals with quercetin reduced the number of CD3, CD20, and CD45 stained cells.

We conclude that quercetin prevents lung inflammation induced by neonatal hyperoxia and we speculate that quercetin might be an effective therapy to prevent the development of BPD.

Key words: BPD, quercetin, hyperoxia, lungs, inflammation.

Femoral artery pseudoaneurysms after transfemoral cardiac catheterisation

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Abstract

The femoral artery pseudoaneurysm is a troublesome groin complication related to the femoral arterial access site used for invasive cardiovascular procedures. Pseudoaneurysm occur when an arterial puncture site does not adequately seal. Pulsatile blood tracks into the perivascular space and is contained by the perivascular structures, which then take on the appearance of a sac. It occurs in 0.1% to 0.2% of diagnostic angiograms and 0.8% to 2.2% following interventional procedures.

The aim of the study was to report our clinical experience with the surgical treatment of iatrogenic pseudoaneurysms of the femoral artery after coronary angiography and percutaneous coronary intervention.

Methods: The study included 14 patients enrolled in Clinic of Vascular Surgery, in University Clinical Center (UCC) of Kosova, between July 2019 and February 2023 on whom coronary angiography and percutaneous coronary intervention via the right femoral artery were performed. All data, including clinical characteristics and complications, were obtained retrospectively from patient chart records. On physical examination, a pulsatile mass was noted in the right groin. End points included pseudoaneurysm and groin hematoma. All patients gave written informed consent for the procedure of cardiac catheterisation and surgical procedure after iatrogenic vascular access lesion.

Results: Complications of pseudoaneurysms included: large hematoma, local pain, neuropathy and local skin ischemia. Average age of patients was 64.4 years old. The surgical treatment consisted in hematoma evacuation, direct closure of artery with polypropylene sutures, drainage. Complications after surgical intervention, such as bleeding and wound infection appeared in three patients. All patients were discharged home in good local and general condition.

Conclusion: With the increasing trend toward minimally invasive procedures, vascular surgeons, as well as interventionalists will be performing more cannulation procedures; hence we will be more involved in the management of this complication more frequently. Several therapeutic strategies have been developed to treat this complication. They include ultrasound-guided compression repair, surgical repair, and minimally invasive percutaneous treatments (thrombin injection, coil embolization and insertion of covered stents). For small, stable pseudoaneurysms (<2 cm), observation with weekly duplex ultrasound until thrombosis occurs is appropriate. Anticoagulation should be held; patients should avoid lifting or bending.

Key words: *femoral artery, coronary angiography, percutaneous coronary intervention, pseudoaneurysm*

ACL Rupture and Femoral Morphology: A Prospective Study Examining the Relationship Between Alpha Angle and Mechanism of Injury

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Abstract

The anterior cruciate ligament (ACL) is a crucial ligament in the knee that provides stability and prevents excessive forward movement of the tibia relative to the femur. ACL injuries are common in sports and can lead to chronic knee instability and degeneration if not treated properly. Risk factors that predispose to this injury are gender, sports activity and recently has been reported that femur morphology plays an important role to this pathology. Femur morphology is described as the thickness of the femoral cortex (the outer layer of the bone) and the shape of the femoral condyles (the rounded ends of the femur that form the joint with the tibia). Our study aims to give more insight to the relationship between ACL and femur anatomy.

This is a prospective study which includes 100 patients who presented with ACL rupture. For each patient we have used Lachmeter to determine ligament laxity pre- and post-operatively. Data was collected on medical history, mechanism of injury, MRI scans and profession. We have measured post-operatively the muscular mass, range of motion and confirmed ligament integration with Lachmeter. All the data was analyzed using SPSS v.23.

Through this study we have measured the alpha angle on a Dunn View X-ray for all of our patients. We have come to conclusion that proximal femur morphology plays a role in ACL rupture. Using Lachmeter we can predict the diagnosis at the first clinical presentation. Compared to other studies which report a female predisposition, our study has found that male gender is more affected, with football and skiing being the most common reason to result in an ACL rupture.

Key words: *ACL, femur, anatomy, morphology*

The role of insulin resistance in hypertension- the pathophysiologic mechanisms

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Abstract

Considering that insulin resistance has been identified as a potential cause of hypertension while hypertension continues to be the primary cause of cardiologic disease, with this study we aim to summarize the pathophysiologic mechanisms that link insulin resistance and hypertension.

The literature search was done in the electronic database “PubMed”, studies of the last 15 years were identified, primary selection was made according to abstract contents whereas final selection was made after reading the full text.

It has been found that insulin resistance does contribute to hypertension through numerous mechanisms. Many studies have linked compensatory hyperinsulinemia of insulin resistance with factors that contribute to hypertension such as the activation of the sympathetic nervous system and abnormal activation of the Renin-Angiotensin-Aldosterone system leading to sodium retention.

Furthermore, it was found that insulin resistance impedes the normal vasodilatory effect of insulin by blocking its signal to release nitric oxide, a potent vasodilator and in addition to this, hypertensive patients were found to have higher levels of asymmetric dimethylarginine, a nitric oxide inhibitor therefore leading to hypertension.

Early stages of insulin resistance were also associated with higher affinity and capacity of Endothelin-1 receptors in conjunction with increased secretion of Endothelin-1, a potent vasoconstrictor therefore contributing to the development of hypertension.

Obesity, endothelial dysfunction, insulin resistance in cardiomyocytes and activation of mineralocorticoid receptors were also linked to both insulin resistance and hypertension.

Available evidence suggests that insulin resistance plays an important role in the pathophysiology of hypertension and its contribution to the development and progression of hypertension has to be taken into account. More studies are needed in order to distill the molecular and cellular mechanisms and develop an effective strategy for the prevention and treatment of hypertension for insulin resistant patients.

Key words: *insulin resistance, hypertension, pathophysiologic mechanisms.*

Resveratrol Supplementation Protects Against Hyperoxia-Induced Lung Injury in Neonatal Rats

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Abstract

Bronchopulmonary dysplasia (BPD) is a substantial clinical problem in the preterm survivors of neonatal intensive care, which is characterized by lung inflammation, airway hyperreactivity and remodeling, and has a multifactorial etiology. Prolonged exposure of premature lungs to hyperoxia contributes to lung injury. There is no effective therapy against adverse effects of hyperoxia. It was shown that resveratrol has anti-inflammatory and antioxidant properties in different medical conditions, however there are no data in relation to its protective effect against hyperoxia-induced lung injury. Therefore, we hypothesized that resveratrol will protect against the adverse effects of hyperoxia in lungs of neonatal rats.

Wistar rat pups (P4) were randomly assigned either to ambient air (AA, 21% O₂)- or hyperoxic ($\geq 95\%$ O₂) groups and exposed for seven days. In subsets of these groups, the animals were supplemented daily with resveratrol (30 mg/kg of body weight; i.p) or saline (vehicle). After the exposure time animals were euthanized and lungs were harvested, and processed for immunohistochemical staining and biochemical analysis. The levels of pro-inflammatory cytokines (IL-1 β and TNF- α) in whole lung homogenate were determined using the ELISA method. Lung sections (5 μ m) were used for immunostaining to determine the macrophage and fibroblast marker (CD68), T-lymphocyte marker (CD3), B-lymphocyte marker (CD20), and CD45 cells.

Hyperoxic exposure significantly increased ($p < 0.01$) the expression of IL-1 β and TNF- α compared to AA exposure, while supplementation of animals with resveratrol prevented this increase of IL-1 β and TNF- α . In lungs of hyperoxic animals the stained cells of CD68, CD3, CD20, CD45 were abundant compared to ambient air exposed lungs. Resveratrol reduced the number of CD68, CD3, CD20, CD45 stained cells.

The results of this study confirm that resveratrol prevents the hyperoxia-induced lung injury, and we speculate that use of resveratrol might be an effective therapeutic approach to prevent the adverse effects of hyperoxia.

Key words: BPD, resveratrol, hyperoxia, lungs, injury.

Association between Hypodontia of the Permanent Lateral Incisors and other Dental Anomalies in School Children Aged 12-16 Years in Kosovo

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Abstract

Objective: to determine the association of Hypodontia of Permanent Lateral Incisors(LI) with other dental anomalies by comparing the two groups: Group 1, with Hypodontia of the Maxillary LI and Group 2, with Hypodontia of the Mandibular LI, in secondary school students in Kosovo.

A total of 3306 secondary school students aged 12-16 years, regardless of gender, were included in this prospective study. The abnormalities investigated were recorded by RTG-panoramic and dental charts. The teeth were recorded as a congenital absence when the mineralization of the crown, identified by panoramic tomography, was absent.

In a sample of 3306 subjects, 2.3% subjects were diagnosed with hypodontia. Hypodontia was found in the upper left LI in 20.4% of cases, in the upper right LI in 18.4% of cases, in the lower left LI was 0.7% and 2.0% on the right side. Just one missing tooth or 0,7% was found in teeth 13, 32, and 46. Group 1 included 92.3%, and Group 2 included 7.6%. In Group 1, 58.3% of cases were bilateral and 41.7% unilateral; in Group 2, 66.7% cases were unilateral and 33.3% cases bilateral. Among dental anomalies, the occurrence of rotation was found in 48.7% of all cases, 47.2% cases in Group 1 and 66.7% cases in Group 2, dental inclination was found in 30.77% of all cases, 27.8% of cases in Group 1 and 66.7% of cases in Group 2, the ectopy was found in 17.9% of cases, 16.7% of cases in Group 1 and 33.3% of cases in Group 2, crown anomalies were evident in 17.9% of patients, all of which were in Group 1. Microdontia was present in two patients in Group 1. transposition, bodily movement, and superposition were present in one patient in Group 1; while in Group 2, one patient had transposition. The frequency of dental transposition was significantly higher in Group 2 than in Group 1 ($P=0.0209$). There were no significant differences in the other dental anomalies between the two groups.

The consequences of hypodontia in dental arches are obvious. Knowing the prevalence of hypodontia and its association with other dental anomalies helps classify the need for further treatment for the patients, whether orthodontic, prosthetic, or surgical.

Key Words: *hypodontia, lateral incisors, dental anomalies*

Vasoactive Intestinal Peptide Attenuates Hyperoxia-Induced Airway Hyperreactivity in Neonatal Rats

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Abstract

Neonatal hyperoxia increases contraction and decreases the relaxation of airway smooth muscle (ASM), and the balance between these processes in airways is critical for normal flow of air. Thus, it is important to search for an effective treatment that targets this balance to prevent the airway hyperreactivity. The non-adrenergic-noncholinergic inhibitory system mediators such as vasoactive intestinal peptide (VIP) play an important role in ASM tone. Therefore, we tested the hypothesis that exogenous VIP will attenuate the contraction and promote relaxation of tracheal smooth muscle exposed to neonatal hyperoxia. Tracheal cylinders were obtained from Wistar rat pups (P10) exposed to hyperoxia ($\geq 95\% \text{ O}_2$) or room air for seven days. These cylinders were used to study contractile responses evoked by carbachol ($10^{-8} - 10^{-4} \text{ M}$) and relaxant responses of ASM evoked by electrical field relaxation (EFS) in precontracted tissue (carbachol, $10\mu\text{M}$) in absence or presence of a single dose of VIP (50 nM). In addition, the dose-response relaxant effect of VIP ($1\text{nM} - 1\mu\text{M}$) was tested in absence or presence of a VPAC receptor antagonist; a protein kinase A (PKA) inhibitor (Rp-8-CPT-cAMPS); a phosphodiesterase 4 (PDE4) inhibitor (rolipram); or a large-conductance calcium-activated potassium channel blocker (charybdotoxin). The relaxation is expressed as a percentage of pre-constricted state, and the data are presented as mean/s.e.m. Hyperoxic exposure significantly decreased the relaxant responses of ASM towards EFS, as compared to those obtained from control animals exposed to room air, and these reduced relaxant responses in hyperoxic tissues were significantly reversed in presence of VIP ($p < 0.01$). VIP induced dose-dependent relaxation and the relaxant responses were overcompensated in hyperoxic animals. VPAC antagonist; PKA or PDE4 inhibition significantly reduced VIP-induced relaxation ($p < 0.05$), while blockade of calcium-activated potassium channel did not have a significant effect.

The results of this study revealed that VIP attenuates airway hyperreactivity and reverses the impaired relaxation of airway smooth muscle induced by hyperoxic exposure via cAMP/PKA signaling pathway. We speculate that the use of VIP might be an effective therapeutic approach to prevent the airway hyperreactivity induced by hyperoxia.

Key words: hyperoxia, VIP, airway, contraction, relaxation.

Assessment of in vitro airway smooth muscles relaxant activity of *Rhus coriaria* fruit ethanolic extract and its possible mechanisms

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Abstract

Rhus coriaria L. (Anacardiaceae), also known as Sumac is commonly used for spice, flavoring agent and traditional medicinal herbal, especially in the Middle Eastern and Mediterranean countries. The main active components are flavonoids, polyphenols, and tannins. The accumulating evidence supports its cardioprotective effects, antidiabetic, neuroprotective, anticancer, neuroprotective, gastroprotective, antibacterial, anti-inflammatory, anti-viral, antioxidant and recently respiratory diseases such as COVID-19. However, there are no previous studies that have shown effects and mechanism in the airway smooth muscles tone, therefore our aim of study was to investigate the in-vitro pharmacological action of *R. coriaria* extract (RCE) on the rat isolated tracheal and bronchial preparations by exploring its relaxant activity and mechanism of action. The direct relaxant effect of RCE (0.1-0.7 mg /mL) was tested in the rat bronchi and trachea rings precontracted by CCh. In addition, the pretreatment with RCE (1 mg/mL) was tested on the bronchial and tracheal reactivity induced by CCh, KCl or CaCl₂. Additionally, Inhibitors of the cyclooxygenase inhibitor indomethacin and, nitric oxide synthase inhibitor Nx-nitro-L-arginine methyl ester (L-NAME), respectively, were used for exploring the mechanisms of RCE induced relaxation and reduction of reactivity. These results suggest that RCE has a relaxation effects on the isolated bronchial and tracheal smooth muscles, and the mechanism may be related to the prostaglandin, nitric oxide and partial involvement of inhibition of calcium channels. Taken together, these findings support also the previous findings and may set the stage for further investigation the effects of RCE in the prevention and treatment of respiratory diseases.

Keywords: *Rhus coriaria* Extract, Bronchial and Tracheal Smooth Muscles, Prostaglandins, Nitric Oxide, Calcium Channel

4. Education Sciences



Adaptive Experiments for Enhancing Digital Education: Benefits and Statistical Challenges

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Abstract

Adaptive digital field experiments are continually increasing in their breadth of use in fields like mobile health and digital education. Using *adaptive* experimentation in education can help not only to explore and eventually compare various arms but also to direct more students to more helpful options. For example, they might explore whether one explanation type (e.g., critiquing an existing explanation or revising one's own explanation) would lead students to gain a better understanding of a scientific concept and assign it more often. In such an experiment, data is rapidly and automatically analyzed to increase the proportion of future participants in the study allocated to better arms.

One way of implementing adaptivity is through algorithms designed to solve multi-armed bandit (MAB) problems, such as Thompson Sampling (TS). The MAB problem is to effectively choose among K available options or arms, in order to maximize the expected outcome of interest (or reward).

In this work, we present real-world case studies of applying TS in education. Specifically, we explore its use for motivating students, through different email reminders, to finalize their online homework. To evaluate the potential of MAB in education, we leverage the power of simulations to further explore the behavior of TS both when there is no difference between arms and when some difference exists. We empirically show that, while adaptive experiments can result in an increased benefit for students, by assigning more people to better arms, they can also cause problems for statistical analysis. Notably, this assignment strategy suggests an alert in drawing statistical conclusions, resulting in an inflated Type I error and a decreased power (failure to conclude there is a difference in arms when there truly is one). We explain why this happens and propose some strategies to mitigate these issues, in the hope to provide building blocks for future research to better balance the competing goals of reward maximization and statistical inference.

Key words: *digital education, adaptive experiments, multi-armed bandits, Thompson sampling.*

Effect of preschool education in preparing children for the first grade in terms of psycholinguistic development

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Abstract

Every child deserves access to quality early childhood education. Quality pre-primary education is the foundation of a child's journey every stage of education that follows relies on its success.

The purpose of this study is to investigate the preschool educational experience for the preparation of children for the first grade in terms of psycholinguistic development. This review is made in the function of the main hypothesis: Preschool education is the first and important stage for a better education and a continuous development for a child referring to education in aspect of linguistics, being more social and with a good mental health.

We chose a group of 200 children in Albania, from which 100 children who do did not attend preschool education and 100 of them who attended preschool education.

The interviews of these children will be analysed linguistically and psycholinguistically.

The entire study will present the characteristic of the development of children of each category and giving suggestions to a better way to achieve the highest quality development of preschool education in the country and beyond.

Key-words: *Preschool education, children, psycholinguistic development, stage.*

Beliefs of pre-service and in-service teachers about teaching and learning science subjects in Kosovo

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Abstract

Teachers' beliefs affect what they do in the classroom, their attitudes, teaching methods, teaching approaches, student development and decision making. The aim of this study was to explore the beliefs of pre-service and in-service teachers in the fields of science teaching (mathematics, biology, chemistry, and physics) in relation to teaching and learning science subjects, which teaching styles they use and how the beliefs of in-service and pre-service teachers change depending on the chosen discipline of study. A sample of 82 pre-service and in-service science teachers in Kosovo was used. In this quantitative research data were collected through the DASTT-C (Draw a science teacher test-Checklist). The participants had to draw themselves as science teachers and answer two open-ended questions. For the data analysis, two instruments were used: The independent analysis of the researchers based on characteristics of teaching styles (explicit, conceptual and exploratory) derived from Thomas' list of 13 attributes and, the data analysis through Thomas' list of 13 attributes divided in three fields (teacher, students and environment). Through this study we discovered that more than half of the pre-service and in-service teachers have traditional beliefs about teaching and learning of science where 50% have explicit style of teaching and learning science, 43% have a conceptual style and only 7% have more of an exploratory style. Also, pre-service and in-service chemistry and physics teachers had similar beliefs in teaching which was explicit and teacher-centered while the pre-service and in-service teachers of mathematics and biology had a conceptual teaching style which is still teacher-centered but directed toward learning science concepts and relating them to real life. Based on Thomas's Attributes, we noticed that there are great similarities between the fields, especially in the first and third fields (the teacher and the environment). Based on this study we were able to conclude that pre-service and in-service teachers in Kosovo still hold traditional beliefs for teaching and learning science.

Key words: *Conceptual style, explicit style, exploratory style, teacher's beliefs.*

Relations between morphological parameters and coordination on ski learning in 13-year-old pupils

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Abstract

The aim of the research was to verify the relationships between anthropometric parameters and motor coordination on ski learning in pupils of the age of 13.41 years with standard deviation ± 0.45 . In the sample of 241 pupils (118 boys and 123 girls), attendants of the skiing course in the project "Drejt Malit" (Through Mountain), anthropometric parameters were tested, body mass and height by calculating the Body Mass Index (BMI), motor coordination through the hexagonal test and the level of skiing after the implementation of the basic skiing curriculum. From the results of descriptive parameters, it is noticed that the sample has normal morphological development. Based on the normative data of the hexagonal test, heterogeneity is observed in the group of girls, respectively below-average coordination in the group of girls and poor in the group of boys. Correlation analysis projected a statistically significant correlation between motor coordination with the level of skiing learning, this more pronounced in boys (-.373 **) than girls (-0.216 *). Through the analysis of differences (T test for independent samples) between groups by gender, a statistically significant difference between the BMI variable (0.01) was confirmed, while through regression analysis, a significant impact of the hexagonal test on ski learning was confirmed only in boys with a level of statistical significance (0.00).

Key words: *pupils, relations, anthropometric characteristics, coordination, skiing.*

Causes of bullying in schools: Case study in Kosovo

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Abstract

Educational institutions are places where students go to acquire knowledge and develop various skills and competencies. These institutions have an important role in the development of an educated and informed society, therefore it is important that they provide a calm and safe educational environment that encourages and facilitates teaching and learning. The appearance of bullying in educational institutions is a disturbing but also harmful phenomenon for all those involved in this process, including students, teachers and parents.

Considering the appearance of bullying in Kosovo schools as a disturbing phenomenon, the study aimed to identify the causes that are leading to the appearance of bullying in educational institutions. The study has a quantitative character and descriptive, correlative and regression methods were used.

175 respondents (N=175) students (grade 6-9) were included in this study. The questionnaire used is by Dan Olweus. The results of the study show that about 31% of students have been victims of bullying in the last six months, 17% of students have caused bullying to other students and 11% of students have indicated that they were victims-aggressors. The main causes of bullying among students are: the desire to be first, aggressiveness, revenge, jealousy and physical weakness.

The inclusion of a larger number of respondents in the study would enable familiarity with the phenomenon of bullying on a wider scale in the country, and the drafting of institutional policies for the prevention of bullying in schools would affect the improvement of the situation.

Key words: *bullying, students, manifestation, teachers, parents.*

Internet safety and attitudes of students working on a computer for primary and secondary school students in the municipality of Pristina

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Abstract

The use of the Internet and its addiction for children has become as interesting as it is inevitable, therefore the interest in the protection of children and knowledge about safety is essential.

The purpose of this paper is to inform and raise children's awareness of Internet safety and the potential risks they may be exposed to while using the Internet; in the behavior and success of children at school, according to the perception of the students themselves and their parents, as well as their opinions regarding the frequency of Internet use they spend while working with the computer. The design of the study is to affirm the new generations that the innovative knowledge and skills strongly bind and accept them visually in their memory.

The population the age groups of students from grades 6-9 were selected, for the reason of incorporating these students in their learning abilities and that consists of children of upper secondary primary schools in the municipality of Pristina, because this age of children spends a lot of time on the computer and the Internet and spends unnecessary and harmful time for their age.

The instrument was realized through the physical questionnaire that was used to collect the data is the questionnaire for the students of this generation, the distribution of a guide on how they access the Internet, how to protect themselves from the Internet, staying in front of the computer and the time they should spend on the Internet. The Internet. The processed data was realized through quantitative and qualitative methodology.

The results are extremely important for the character of visual learning through advanced computer methods and as such it is recommended for these age groups of this research, which are children in general do not have sufficient knowledge about the security risks of the Internet and have underestimated the time they spend online. The vast majority of them think that sitting in front of the computer has no or little effect on their physical injuries.

Key words: *Internet, security, computer, children, school, etc.*

Building an Inclusive Mindset within mainstream classroom: Case Study in Educational Institutions of Kosovo

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Abstract

The inclusion of students with special needs and special educational needs in regular classes is beneficial first for students with special needs and special educational needs, but also for their peers and the whole community. The use of exclusionary strategies and approaches by teachers within the regular classroom directly affects the difficulties that students with special needs will experience during the transition process to regular educational institutions, which is a very complex and challenging process. Sometimes, even the presence of the assistant teacher causes additional attention to be paid to the child, which risks making inclusion and integration even more difficult.

This study aims to explore the different teaching strategies and approaches that can be used by teachers to develop an inclusive mindset within a regular classroom, with the main aim of enabling a smooth and inclusive transition process of students with special needs and special educational needs in regular classes, bearing in mind that this form of inclusion should not interfere with the development of other students, affecting their achievements and general well-being.

In order to achieve the aim of this research, the qualitative method of the case study was chosen, whereby three cases of students with different developmental abilities were studied, whose age ranged from 6 to 10 years and were at different educational levels at primary education. The focus is placed on the students' transition phase as well as their adaptation to the inclusive classroom. The focus is also placed on developing inclusive mindsets among each other. Semi-structured interviews with parents and teachers were also conducted. A total of 8 parents participated in the study, 5 of them were parents of students with typical development and 3 of them were parents of students with special needs and 3 teachers. The results of this study have enabled us to better understand the appropriate strategies to build an inclusive mindset that support the transition and inclusion of students in mainstream classes.

Key words: *teaching strategies, approach, inclusion, transition.*

Analysis of the correlation between success in basic subjects and scholarships among architecture students

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Abstract

In this paper are analyzed the results of the subjects 'Descriptive geometry' and 'Design of single-family housing facilities', which are taught in the first and second year of studies in Architecture and design faculty. The aim of this paper is to examine the possibility of a correlation of the positive exam results in these subjects with the fact that a number of students are recipients of scholarships. The data used in this paper is primary, it's collected from the exam results of the last two academic years, in the Faculty of Architecture and Design by SEEU, on two campuses, Skopje and Tetovo campus, as well as from the university's database for students' scholarships. The exam on the subject 'Design of single-family housing facilities' has three parts: written exam, project analysis and project design. The exam on the subject 'Descriptive geometry' is consisted of homework and final exam.

The paper uses the methods of: Difficulty index and Discrimination index of the tests, calculating the following parameters: Average grade, Total points collected during the semester and Success rate. The aim of this paper is to find out if the obtaining of a scholarship from students is an indicator for the proclivity of students to succeed and excel in their studies on basic subjects in their studies in the field of architecture and design.

The results of this study show that the good grades of the students are not a result of the low difficulty of the tests, instead they are correlated to the fact that the students have scholarships and achieve good results to keep them, which can be a good stimulator for the University to attract high achieving students.

Key words: *exam result analysis, difficulty index, discrimination index, Architecture and design.*

Impact of post-Covid pandemic in the learning process to Albanian schools

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Abstract

This paper aims to identify the challenges faced by students and teachers in Albania schools during and after the Covid-19 pandemic period and provide suggestions for addressing them. Then some suggestions will be given regarding the importance of completing the teaching elements received partially or missing by the students in order to reduce as much as possible the gap that was created in a part of the students during the pandemic period. These issues have emerged from questionnaires organized with students of pre-university education classes from 5th to 12th grade (293 students in total), parents (54 in total) and teachers (31 in total) of schools in the area of Tirana and Kruja. The questionnaires were conducted in November 2021 in three different schools of 5th to 9th grades and in four different schools of 10th to 12th grades.

Albanian institutions, as in many other countries of the world, during the Covid-19 pandemic took measures to develop distance learning for a period that coincides with approximately four semesters (March 2020 - June 2021). This new way of distance learning was quickly embraced by the teacher and most of the students but nevertheless brought negative consequences during the learning process. Some of the consequences that are related to the technical side of this process, passed on to children who come from poor families, leaving these children with significant shortcomings in the learning process. Problems such as the tendency to be isolated from their friends, problems in adaptation with others, loss of concentration, aggression and in some cases even bullying and violence were some of the most negative consequences that the pandemic brought to education. Identifying these problems was the first step to eliminate the consequences left by the pandemic period in education and to establish sustainable education for our children.

Key words: Covid-19 pandemic, on-line learning, teaching and the pandemic, sustainable teaching/learning

The underrepresentation of women in education management in Kosovo: reflections from school principals

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Abstract

While women dominate the teaching profession in pre-university education in Kosovo, men occupy most of the school management positions. As is the case in many other parts of the world, the reasons why women in Kosovo face obstacles when it comes to accessing education leadership and management positions are not yet fully understood. The purpose of this study is to identify the factors that contribute to the ongoing underrepresentation of women in management positions in primary and secondary schools in Kosovo. The study is explored through exploratory case study and semi-structured interviews are employed with 12 principals, six women, and six men, from primary and secondary schools in Kosovo. The findings of the study suggest that women face cultural factors such as gender bias regarding management and socialization that limit their aspirations to take on leadership positions, as well as structural and institutional factors that make it difficult for them to access these positions.

Key words: *education management, underrepresentation, school principals*

The application of contemporary methods according to the curriculum for the subject of the Albanian language in primary education

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Abstract

The curriculum field "Languages and communication" for primary education enables students to develop simple skills, such as: the difference between literary and non-literary texts, the recognition of the basic forms of the language system (phonetics, morphology, syntax), the development of expression skills through different linguistic means.

This curricular area in primary education, based on the Curricular Framework, contains the following subjects: mother tongue, first foreign language (English language, German language). Also, this field prepares students for functional, clear and meaningful communication.

Through the Albanian language course, students are enabled to develop the main skills: listening, speaking, writing, reading, with the aim of developing curricular competences, which they must also master in everyday life.

The success of the implementation of the curriculum in the subject of the Albanian language finds its concrete expression in the application of contemporary teaching methods, which serve us as a basis for building the concept of activities and their organization in the learning process. Based on the importance of the use of contemporary teaching methods, we intend to treat this research paper from the perspective of the application of contemporary methods in the subject of the Albanian language, which we consider to be necessary for the identification of activities that influence the implementation of the curriculum in the subject of the Albanian language.

In order to carry out the research, we will use the qualitative and quantitative method, preparing a questionnaire for the teachers of the Albanian language at the level of primary and lower secondary education, more precisely of grades VI-IX, in the municipality of Gjilan, Vitia, Kamenica, Ferizaj. Also, we will do a partial review during the lessons within the Albanian Language subject.

Key words: *curriculum, Albanian language, contemporary methods, teaching, implementation.*

The impact of environmental education in early childhood on sustainable development, case of Kosovo

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Abstract

Humanity is currently facing a deep energy crisis and great environmental pollution. To make saving energy and protecting the environment a good habit from childhood, this paper presents an analysis carried out for the rural part of a municipality in Kosovo, where the group under consideration consists of the full number of all students. The analysis has to do with habits in energy consumption for daily activities and the role that information can play in the possibility of changing these habits to protect the environment. The study results show that the activities that can be done with minimal energy consumption are currently done with very large consumption. Also, since the interest group consists of students of different ages (11–15), there is a lack of basic information in terms of environmental protection and energy consumption, as well as their role in the community. The methodology used in this case is a statistical one based on the collection of data according to the forms completed by the students themselves. The selection of data and the formation of graphs depend on their return information. The number of students included in the study is 55. In this study sample, about 60% are girls. The study highlights the importance of awareness and the use of campaigns, whether on television or even on school premises, for environmental protection. Most of the activities have consumption rates that are more than double the spending rates for those activities. The activity of brushing teeth in female students is associated with 53% higher energy consumption, in males, this activity is associated with 78% higher consumption in male students. Cleaning the face, and cleaning the body has a higher consumption, therefore, on average, it is about 50% higher consumption. Education begins at an early age, and the drafting of awareness-raising policies for this issue will play a role in the country's sustainable development.

Key words: *energy, environment protection, students, rural community, energy savings.*

The role of sociocultural Diversity in students' behavior

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Abstract

As a rights-based approach that incorporates all aspects of education and their contribution to the full development of the child, diversity in education helps to lay the foundation for shared understanding and the building of a cohesive society. Students should feel motivated, respected, valued, and more involved in developing a learning atmosphere where communication between all is open, honest, continuous, and trusting.

This study shows at the impact of socio-cultural diversity in society, particularly in education and issues of interest to contemporary education and the development of our society. Acceptance of diversity in our country is a very controversial topic that was not considered as such in the past, but today the need to accept it is revealed to us all around, in school, in society, in workplace and in life.

This research is quantitative. The respondents of this study were 100 primary and secondary school teachers from Gjilan, Kamenica and Vitia, with whom we have filled in a Likert scale questionnaire and 50 students of grades 5, 6, 7, 8 and 9, with whom we have conducted a semi-structured interview.

The purpose of this research was to see the role of socio-cultural diversity in the behaviors of students in today's era of globalization. The research questions were: 1. How much influence does socio-cultural diversity have on students' behavior? 2. Which are behaviors that are manifested by children influenced by socio-cultural diversity and how much do these behaviors affect in the results of students?

Hypotheses of this study were: We assumed that socio-cultural diversity has an impact on students' behaviors; and We assumed that children manifest different behaviors as a result of the influence of socio-cultural diversity;

The data has been analyzed using the Statistical Package of Social Sciences - SPSS 21 and regression analyses were been carried out.

From the outcomes we collected, we understood that socio-cultural diversity has a great impact on students' behavior. The two of hypothesis are proven to be affirmed.

We are a multicultural country, based on this fact, of course, the trends of globalization also affect the new generation of students at school as well, this is the reason why we have seen it reasonable to seek closely on these issues that are present in our society.

Key words: Education, diversity, communication, behavior, society.

The role of demonstrations in the teaching and learning of physics in primary schools

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Abstract

This study aims to analyze the role of demonstrations in the teaching and learning of physics in elementary schools. Focusing on a constructivist approach to teaching theory, this study aims to show how well-prepared demonstrations can help increase students' interest in physics, improve their understanding of difficult physical concepts, and enhance their problem-solving skills.

The methodology of this study is based on a quantitative and qualitative analysis of a small sample of students in elementary schools, through short surveys and interviews conducted by physics teachers and students. The results of the study showed that students who had completed physics demonstrations had more interest and motivation to learn, better understood difficult concepts, and were better prepared for laboratory exercises.

In conclusion, this study suggests that the use of demonstrations in teaching physics in elementary schools can be a powerful tool for improving the teaching and learning of this subject. Furthermore, this approach can be applied to other scientific disciplines and can help enhance students' ability to understand and solve complex problems in natural sciences.

Key words: *Teaching, learning, demonstrations, physics.*

5. Economics, Finance, Management and Marketing

The role of institutions in energy transition and economic growth in West Balkan Countries

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Abstract

This paper aims to investigate effects of the quality of institutions in accelerating the energy transition. Countries of the Western Balkan (Albania, Bosnia and Hercegovina, Kosova, Montenegro, North Macedonia and Serbia), continue to be considered as countries in transition, which ends with the integration into the EU. Their path to the EU forces them, among other things, to embrace the EU's objectives for energy transition towards CO₂ reduction. Although it has been known since 2009, what individual WB states have done during this period in this regard, is not significant. This may be true due to problems with institutional factors such as: rule of law, corruption, political stability, good governance, etc. These factors, affect the overall energy consumption and the energy transition, measured by the level of renewable energy consumption and the reduction of CO₂ pollution. The study brings forward the relationship between institutions, energy transition and economic growth of WB, for the period 2005-2020, using data from World Development Indicator and International Energy Agency, for the period 2005-2020.

The research uses four econometric models, which employs regression techniques, based on fixed and random effects. The results, found positive and statistically significant relationship between GDPpc, CO₂ and final consumption expenditures and the governance effectiveness (GE) in total energy consumption (TEC). While control of corruption (CC) has a negative effect on TEC. CC has a greater and statistically significant impact on renewables (RE) growth. The findings also reveal that the increase in TEC negatively affects the growth of GDPpc at significant levels of 1%. While the GE and the rule of law, positively influence the growth of GDPpc. Final consumption and net export, have a positive and statistically significant effect on the dependent variables in all four-study models, TEC, RE, GDP and GDPpc. The article concludes that the region is energy dependent, and the energy consumption increases with economic growth. Therefore, the energy transition will affect the GDP. However, the increase in institutional qualities will help countries accelerate the energy transition, affecting efficiency in the use of energy, reducing pollution through the increase in renewable energy consumption, as well as, reducing dependence on imports.

Key words: *Economic Growth, Institutions, Energy Transition, Renewable energy, CO₂*

The qualitative methodological approach in strategic management studies

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Abstract

Qualitative research is a form of research that enables the understanding of social sciences and humanities. Although it is not intended to obtain data that can be generalized to the entire population, it is particularly suitable when the observation of a social phenomenon is difficult to measure. The goal, of course, is to fill gaps in knowledge by examining people's beliefs, attitudes, behaviors, relationships, attitudes, and experiences. The methodological rigor imposed by the qualitative approach guarantees the quality of the obtained results, which provides in-depth information that serves the study of sociocultural factors of individuals or communities. This approach includes several research methods and strategies, such as observations, narrative research, grounded theory, oral history, feminist research, ethnography, autoethnography, case studies, action research, interviews, etc. Despite the widespread use and belief in the superior quality of quantitative research, there are many requirements for practice-based research that it may or may not fulfill. Therefore, the purpose of this article is to examine in detail the notion of a qualitative approach and to explain the need for qualitative methods and their importance in the literature on management research. In this way, this article examines and evaluates the idea that qualitative methods provide opportunities for finding answers and generating research that quantitative methods cannot. The article also analytically discusses the value of viewing qualitative methods as a complementary approach to quantitative methods, rather than a binary approach that favors one method or approach. This is to draw attention to the appreciation of the quality of qualitative research and show how qualitative research can sometimes be considered a better method than quantitative research. In other words, qualitative research has the potential to provide rich detailed information and contextual explanations for many of the challenges currently facing strategic management researchers. However, the results of our study confirm that qualitative methods are still underrepresented in management research. One of the key challenges of qualitative research is the lack of scientific knowledge in building the theory and practice of strategic management, as nicely as awareness of the variety of qualitative methods available, especially how to apply them correctly and effectively. By providing some methodological suggestions and guidelines for the use of qualitative research, we believe that we will contribute to their practical application and thereby further enrich the quality of research in strategic management.

Keywords: *research methodology, qualitative approach, strategic management.*

The effect of financial development on income inequality

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Abstract

Reducing income inequality and increasing access to financial institutions play a vital role in achieving the objective of sustainable development. This research aims to examine the impact of independent variables (credit demand, GDP per capita, inflation, government consumption expenditure and education) on the Gini coefficient in the 27 member countries of the European Union in a period of 2008-2019. The study relied on secondary data, which was obtained from the international organization, the World Bank. The type of data that was used in the research belongs to the panel type, and it was realized with a total of 324 observations. Due to the use of panel data, several types of econometric models have been implemented in this research. The analysis begins with the use of the OLS model, but due to the work on unbalanced panels, the fixed effects model (FE) and the random effects model (RE) were also used. Also, due to the endogeneity of the variables, the GMM model was also used. According to the findings from the presentation of econometric models, credit demand and education positively affect income inequality, while GDP per capita, inflation and government consumption expenditures negatively affect income inequality. As for the importance of the variables, the findings show that the variable of credit demand, GDP per capita, inflation and government consumption expenditures have a significant impact on income inequality.

Keywords: *Gini coefficient, GDP per capita, Inflation, Government Consumption Expenditures, Education.*

Factors Influencing the Creation of a Favorable Business Environment for the Circulation of Goods and Services in the Western Balkan Countries

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Abstract

The purpose of this paper is to analyze the impact of inflation on the circulation and exchange of goods and services of the Western Balkan countries, as well as the importance of free trade agreements and the membership of these countries in international organizations. The research aims to study the relationships between the external balance of goods and services (EBGS), inflation and trade (INF and TRD), current account balance (CAB), real interest rate (RIR), foreign direct investments (FDI) and the growth of the gross domestic product (GDP) of these countries. The research approach is based on deduction and to achieve the research goals, the secondary data provided by the relevant and reliable database of international and local organizations will be used, as well as the mixed methods in scientific research will be applied. Likewise, the research will consider linear regression analysis, linear trend analysis and comparative analysis for these countries so that the findings are clear and concrete. The findings from this research are expected to make clear the relationship that exists between the variables included in the model, with special emphasis on the relationship between inflation and the external balance of goods and services. Also, the role and importance of free trade agreements and the impact of these agreements on trade openness will be understood. This paper will clarify the relationship between EBGS, INF, TRD, CAB, RIR, FDI and GDP, and its results will be valuable for the sectors of circulation of goods and services in the mentioned countries, and can be used by researchers as a comparative basis for their research related to this field of study. The study carried out represents the original work of the authors and all the results presented are based on the authors' own calculations. The data and information presented in the paper are obtained from relevant sources and are correctly cited and referenced.

Key words: *external balance, inflation, free trade agreements, goods, services.*

The integration of Environmental, Sustainability, and Governance (ESG) factors into corporate governance: Theoretical Perspectives

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Abstract

The integration of environmental, sustainability and governance factors into corporate governance has gained increasing attention in past years, as companies continue to promote sustainable business practices and enhance their reputation from the stakeholders perspective. Despite this growing interest, there is limited understanding of the theoretical frameworks that guide the integration of ESG factors into corporate governance. This paper aims to provide a comprehensive overview of existing theoretical approaches to the integration of ESG factors in corporate governance. Through a systematic literature review, we analyze the underlying principles, challenges and future directions of ESG integration in corporate governance. Our findings highlight the importance of considering a variety of theoretical perspectives, including stakeholder theory, agency theory, and institutional theory, to understand the complexities of ESG integration. This research provides a valuable resource for researchers and practitioners interested in advancing the integration of ESG factors into corporate governance and promoting sustainable business practices.

Key words: *ESG, Corporate Governance, Corporate performance;*

Towards Circular Economy, enhancing sustainability and social responsibility through Blockchain Technology

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Abstract

The transition from a linear economy model to a circular economy is a key challenge of the 21st century, as it can contribute to global sustainable development. Technological innovations are necessary to achieve responsible consumption and production, and blockchain technology has the potential to provide solutions such as security, transparency, and traceability that can facilitate this transition. This study reviews current literature and findings related to the circular economy, blockchain technology, and smart contracts. It also discusses the use of Proof of Stake as an alternative consensus mechanism that is more energy-efficient than Proof of Work. Key findings include the potential of blockchain technology to facilitate efficient cooperation, coordination, and other solutions that can have a significant impact on achieving the goals of the circular economy transition. Furthermore it presents startup companies that use a circular economy approach with blockchain technology, highlighting their potential impact on various business sectors. The study explore the intersection between blockchain technology and the circular economy, providing insight into the key aspects of both fields and identifying the potential for blockchain technology to enable and accelerate the transition to a circular economy. It lies in the growing need for sustainable solutions in the face of 21st-century environmental challenges, and the potential of blockchain technology to contribute to achieving the global sustainable development agenda. The findings of this study can provide valuable insights for policymakers, researchers, and entrepreneurs who seek to address the challenges of sustainability and circular economy through innovative technologies.

Key words: *Blockchain technology, Circular economy, Startup initiatives.*

Job Design and Employee Performance- Evidence from Kosovo

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Abstract

Job design is very important practice for the enterprise. If employees have a negative perception of their job design, they are likely to be absent, have stress-related illnesses, and their productivity and engagement tend to be low. Job design remains a valued issue among researchers for its importance and effectiveness. This paper attempts to analyze how an enterprise job design impacts the performance of employees. Enterprise which encourages good job design such as manageable workload, job description, job expectations non-discriminatory policies, opportunities for developing new skills, will increase employee's performance. Our research uses the quantitative technique, using structured questionnaires containing 25 questions. 319 managers of three economic sectors (production, trade, and services) of SMEs in Kosovo answered the questionnaires from May to July 2022. Linear regression empirical technique was used to explore the impact of job design on employee performance. Our findings suggest that an enterprise can increase its productivity through improving job design. Over 50% of employees agree that jobs are designed to optimize their skills and that most employees are qualified or are able to develop new skills for the job.

Key words: *job design, employee performance, job description, SME*

E-Tourism Developments: Technologies Adoption in the Albanian hospitality sector

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Abstract

Information and communication technologies (ICTs) have completely changed the travel industry. E-tourism illustrates the digitalization of all value chains and processes in the travel, tourism, hospitality, and catering industries. In particular, the tourism and hospitality industries have benefited from information and communications technologies (ICTs), reengineering the sector to increase customer satisfaction, while simultaneously bridging suppliers, intermediaries, and end consumers. This study examines the relationship between information and communication technology and e-tourism development in the Albanian hospitality sector. In Albania, the hospitality sector is growing and is a key driver of the country's tourism industry. The study specifically looks at the rate of ICT diffusion in hospitality businesses. The dataset for this study comes from a survey of hotels in Albania. The findings show that although the Albanian online hospitality market is still in its early stages of e-commerce deployment, it has a lot of potential for future e-tourism developments. Overall, the empirical findings show that the development of ICT and infrastructure has created enormous opportunities for expanding and bolstering Albanian hospitality sector. Utilizing technology has benefited hospitality businesses in a number of ways, including lower costs, increased revenues, simpler marketing research and database development, and customer retention. The importance of the study consists on the lack of any similar research that looks at e-tourism and technologies adoption in the Albanian hospitality sector. As a result, the findings of this study may serve as a starting point for other studies in the Albanian tourism sector.

Key words: *E-tourism, information communication technologies, Albanian hospitality sector, Tourism Industry.*

The impact of balance of payments on economic growth of Western Balkan countries

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Abstract

This study aims to analyze the impact of the balance of payments on growth prospects of six Western Balkans (WB-6, hereafter) countries. The main focus is to see how the balance of payments can have a positive or negative impact on the WB-6 countries, who share similar political agenda on the grounds of EU integration and see how they manage their balance of payments accounts. For the comprehension of this study we will use secondary data for a yearly time span: 2010-2020, that will be provided by relevant international institutions, like: World Bank, International Monetary Fund and European Central Bank. In this analysis, part of the literature review, will focused on outlining the main findings of relevant empirical papers that deal with the relationship between balance of payment and economic growth. The countries that will be included in the research are: Kosovo, Albania, North Macedonia, Serbia, Montenegro and Bosnia and Herzegovina. Based on the empirical results obtained from this study, we can conclude that the balance of payments has a positive impact on the economic growth of the Western Balkan countries for the analyzed period 2010-2020. Based on the results obtained from this study, we can say that these results can serve as a good evidence for future research that will be analyzed in the field of finance and economics, and can serve as a result of benefits for the countries of the Western Balkans that we have analyzed. This paper presents real and consistent results in relation to relevant conclusions. The analyzed period (2010-2020) is a convincing period for drawing competent conclusions and recommendations.

Key words: *Balance of payments, GDP, investments, remittances, inflation.*

The increase in prices, a consequence of inflation or disconnection of the supply chain

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Abstract

The increase in general demand, as a result of economic recovery, together with external inflationary pressures as a result of the increase in energy prices, and the prices of goods imported from partner countries, influenced Kosovo to report an increase in general prices in the country. The pandemic ignited the problem. The global supply chain is highly complex and interconnected, especially in times of turmoil. Much of the crisis began in the outbreak of Covid-19, which caused an economic slowdown, mass layoffs and production disruptions. The war in Ukraine is exacerbating rising energy prices and supply chain disruptions that have emerged during the pandemic. These two factors will weigh on the evolution of transport prices, and logistics costs in general. Industry analysts confirm that today's higher wholesale prices are a direct result of tight supplies due to labor shortages, higher input costs for things like raw materials, grains, electricity workers, fuels and strong consumer demand. The reasons why prices are rising are complex and numerous. But one of the most important is related to the dynamics of supply and demand. The methodology used focuses on the collection, analysis and processing of real data, published by the relevant state institutions, and other data collected through interviews - during the period January - February 2023, with business managers at the level of Kosovo. The main results of the research show that the increase in prices is the result of problems in the supply chain, the lack of labor and the increase in the cost of goods.

Key words: *inflation, crisis, supply chain, prices, economic.*

Gravity theory and international trade: Evidence from the Balkans

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Abstract

This paper explores the determinants of international trade between Western Balkan countries and the some of the most important partners through the gravity theory. The basic gravity model contains the economic sizes and the bilateral distance, which approximates trade costs. GDPs or GDPs per capita are the most common estimators of income levels. We formulate and estimate a gravity equation for trade flows, including basic and original explanators. We consider fifteen partners for each of the six Western Balkan countries, over the period from 2008 to 2019. We apply a typical estimation technique for panel data models, the random effects estimator. The statistical effect of the considered independent variables is generally confirmed and the resulting R-squared is relatively high. More specifically, bilateral trade is positively related to the corresponding populations, incomes per capita and free trade agreements. On the other hand, trade is negatively correlated with the distance between capital cities or economic centers.

Key words: *gravity theory, international trade, Balkans.*

Practical methods for incorporating Sustainable Development Goals into the university business curriculum

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Abstract

In 2015, The United Nations introduced 17 Sustainable Development Goals (SDGs) intended to solve the world's most pressing problems. Despite their adoption, global awareness of the SDGs is generally low. Universities have a unique ability to facilitate social change. Educators in various disciplines can create awareness for the SDGs in their curricula, and both students and graduates can apply their new knowledge in organizations and advocate for important change to address urgent global challenges.

At Salem State University's business school, we have consciously incorporated sustainability across the curriculum. This paper details several approaches we have employed across all three axes of the academic mission, provides concrete examples, discusses how universities might engage in educational bricolage to remix existing programs and activities to focus them on sustainability, and reports preliminary results.

Teaching: We created several new courses, including courses focused on sustainability, community engagement, and social business, and a course that incorporates sociolegal concepts and applies a strategic lens to sustainability issues. We incorporate sustainability-themed assignments throughout the remaining curriculum, such as an ESG research assignment using SASB navigator, and numerous case studies. We have supported several students doing high-impact practices such as internships in environmental nonprofits, or working directly with the community in tax preparation and consulting projects. And, we have developed course modules and teaching materials on sustainability, community-engaged teaching, and stakeholder relations, which are shared amongst the faculty.

Research: We reframed our faculty classification system to directly align research activities with the UNSDGs. We have also incentivized faculty research through competitive applications for research release time, such as the Dean's faculty fellow program, or support provided by the endowed chair in accounting. We also encourage faculty to work on transdisciplinary and community-engaged approaches, which count for faculty evaluation purposes.

Service: We encourage students to participate in a community-facing day of service. We support faculty engaged in high-impact service and systemic change work, such as the Fulbright specialist grant, and support community-engaged programs, such as the Volunteer Income Tax Assistance program.

Findings: These changes have impact. Remapping our faculty classification system to link existing activity to the SDGs demonstrates that research engagement is high. Qualitative data indicates that providing institutional support for community-engaged and SDG-focused pedagogies has impact as well.

Key words: Sustainability, ESG, University Education, Curriculum Design, Research Impact.

Correlation Between House Prices and Stock Prices

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Abstract

The purpose of this study is to provide an explanatory approach regarding the correlation between house prices and stock prices. The essence lies in clarifying the relationship between these two variables, namely the correlation between the house price and stock price in the international capital financial markets. The methodology applied in this paper is the qualitative approach through meta-analysis, critical analysis of various scientific studies and case studies related to the dynamic correlation between house prices and stock prices. Through the qualitative approach of meta-analysis, critical review and case studies, this research paper discusses the dynamic correlation and causality between house prices and stock prices in seven European countries, with special emphasis on the financial market of Sweden and Turkey. The relationship between house prices and stock prices is negative, but there may be cases where there is also a positive relationship between them. So, in different countries there are differences between the relationship of these two variables. The empirical findings of this study show that real estate prices and stock prices have declined during the financial crisis (2007-2009). Central banks must anticipate house price developments when planning interest rates to keep inflation low and stable. So, a means must be created for families to protect themselves from house price fluctuations, because this is important when a country faces a financial crisis. Policymakers dealing with the financial situation should pay attention to the development of the real estate market to prevent volatility in the stock market.

Key words: *house price, stock price, interest rates, mortgage loan, financial crisis.*

Financial Management transition gaps of Businesses in Kosovo

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Abstract

Business growth challenges and the transition cycle determine the business success, so the entrepreneurs' ability to adapt the transition core procedures of doing business is demanding, often facing unforeseen issues for Kosovar entrepreneurs or the successor of family businesses. The Kosovo business climate today is likely as the majority of businesses in the stages of their development yield growth, but the transition gap swallows them up and terminates their motivation to do business at all.

This paper analyzes the progress of businesses in Kosovo last five years, trying to find the rationality of why this transition can be obscure, but their financial management and control doubts limit them when they reach their highest operating cycles. It analyzes the lack of transition planning time, the experience of entrepreneurs related to the transition, the expectations and crucial transition instruments, and the ability to absorb funds and external capital in the business.

The methodology used in this paper clusters from the survey of 205 business entrepreneurs from the regions of Prishtina and Ferizaj collected during the year 2022, as well as valuable reports from local and international institutions on doing business environment and the investment climate in Kosovo with a notable emphasis on the analysis of the financial management of the businesses and the financial management decision of Kosovar entrepreneurs.

Keywords: *Transition in Business, Financial Management, Business Cycles, Financial Decision, Investment Effects in Business, Transition gaps.*

Relation between environmental impact and financial structure of the banking sector in Kosovo

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Abstract

The relationship between environmental impact and the financial structure of the banking sector in Kosovo is an important and complex topic that requires careful examination. The banking sector is a key player in the financial market and plays a vital role in the growth and development of an economy. In recent years, there has been an increased focus on the environmental impact of the banking sector, given the important role that the sector plays in driving economic growth. This study aims to explore the relationship between environmental impact and the financial structure of the banking sector in Kosovo, to understand how the sector can be made more sustainable and environmentally friendly.

To achieve this goal, the study employs a mixed-methods approach, including both qualitative and quantitative data analysis. The qualitative data is collected through interviews with key stakeholders in the banking sector, including bankers, regulators, and environmental experts. This data is analyzed using a qualitative content analysis approach, which involves coding and categorizing the data based on themes that emerge from the interviews. The quantitative data is collected through a survey of the banking sector in Kosovo, which is analyzed using descriptive and inferential statistics.

The results of the study suggest that there is a strong relationship between environmental impact and the financial structure of the banking sector in Kosovo. Specifically, the study finds that the banking sector's financial structure, including the sector's size and composition, as well as the types of financial products and services offered, has a significant impact on the sector's environmental impact. Furthermore, the study finds that the banking sector in Kosovo has a relatively low level of environmental awareness and needs to take adequate measures to minimize its environmental impact.

Based on the findings of this study, it is concluded that the banking sector in Kosovo has a significant role to play in reducing its environmental impact and contributing to a more sustainable and environmentally friendly future. To achieve this, the sector must increase its environmental awareness and implement sustainable and environmentally friendly practices. This can be done by incorporating environmental considerations into the financial structure of the sector, including the types of financial products and services offered, and by investing in renewable energy and other sustainable technologies.

Key words: *Environmental Impact, Financial Structure, Banking Sector, Kosovo.*

Reform of the European Union Reference Rate EURIBOR and EONIA

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Abstract

The affair with the manipulation of benchmarks in the European Union has affected the integrity of the interest rates used as benchmarks. EURIBOR and EONIA do not reflect the real cost of borrowing, which together with a serious fall in transactions make these benchmarks unreliable. Therefore, interest rate benchmark reforms have been initiated in both rates in accordance with the adopted European Union Benchmarks Regulation. EURIBOR will be reformed adopting a new hybrid methodology based on real transactions, unlike EONIA which will be replaced by the new overnight rate of ESTER. In the transition period, testing of both rates will be carried out on several occasions in order to remove shortcomings and deliver robust risk-free rates until the beginning of their implementation on 1.1.2020. In the transition period, all market participants must adapt their systems, contracts, and processes to be ready to operate on new reference rates.

Key words: *European Union, reference rate, EURIBOR, EONIA.*

6&7. Information technology and communication / Technology & Engineering

Exploring the Design and Implementation of a DLT-Based Central Securities Depository

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Abstract

This paper examines the potential application of distributed ledger technologies (DLT) in central securities depositories (CSD). The use of DLT in financial systems has gained significant attention in recent years due to its potential to increase efficiency and reduce costs. The study explores the current state of CSD systems in Albania and their limitations, and then investigates how DLT can be used to address these issues. The research includes a literature review of DLT and CSD, as well as a case study analysis of a specific DLT-based CSD prototype. The findings suggest that DLT has the potential to bring significant improvements to the functionality and security of CSD systems, and can enable new features such as real-time settlement and enhanced transparency. However, the implementation of DLT in CSDs also requires careful consideration of legal and regulatory requirements, as well as the management of operational risks. This paper concludes with recommendations for future research and implementation of DLT in CSDs.

Key words: *Distributed ledger technology, Computer Science, Central securities depositories, Technical requirements, Financial industry.*

Investigating the Impact of Occupant-related Characteristics on Thermal Comfort in Buildings using Machine Learning

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Abstract

Ensuring optimal thermal comfort is crucial for the well-being and productivity of building occupants considering that people spend around 90% of their time indoors. The perceived thermal comfort is influenced by various environmental factors such as indoor air temperature, relative humidity, air velocity, as well as personal factors such as metabolic rate, body mass index (BMI), age, and gender. In this research, the impact of occupant-related factors on the perceived thermal comfort of building occupants is analyzed using available data from the ASHRAE Global Thermal Comfort Database II. The analysis is performed by developing a predictive model using Random Forest machine learning technique, that can forecast thermal comfort levels based on environmental and personal factors. Furthermore, a sensitivity analysis is then conducted to determine the impact of personal factors such as metabolic rate, BMI, age, and gender on the model. The results of this study are important because the data-driven model using machine learning, allows for the prediction of thermal comfort in buildings with simple indoor measurement data. Additionally, the sensitivity analysis helps identify the personal factors that have a more substantial impact on the thermal comfort model. The findings from this research are useful for building managers and practitioners as it allows them to predict thermal comfort levels based on the expected type of building users.

Keywords: *Thermal Comfort Model, Machine learning, Random Forest, Sensitivity analysis, Building occupants.*

Chemical stability of yttria partially stabilized zirconia dental ceramics

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Abstract

In this study, the chemical stability of Y-TZP dental ceramic was determined by the modified standard method ISO 6872. The phase composition of Y-TZP dental ceramic was determined by X-ray diffraction (XRD) analysis, the microstructure was analyzed by Scanning Electron Microscopy (SEM). Chemical stability of investigated Y-TZP dental ceramic was determined by measuring eluted Al^{3+} , Na^+ , Ca^{2+} , K^+ , Si^{4+} , Fe^{3+} , Zn^{2+} , Mg^{2+} , Sr^{2+} , Ba^{2+} , Y^{3+} and Zr^{4+} ions by High Resolution Inductively Coupled Plasma Mass Spectrometry (HR-ICP-MS). According to the standard ISO 6872 chemical stability of dental ceramic is carried out in 4 wt. % CH_3COOH aqueous solution at 80 °C during 16 h. In this work, exposure time was extended up to 768 hours (32 days) in order to determine the corrosion rate constant. The parabolic reaction rate constant was $5.3 \times 10^{-5} \text{ } \mu\text{g}^2 \text{ cm}^{-4} \text{ h}^{-1}$. XRD analysis showed that the corrosion process course of partial tetragonal to monoclinic phase transformation of ZrO_2 .

Key words: Y-TZP dental ceramic, chemical stability, hardness.

Development and Codification of Earthquake Resistant Design for territory of Kosova.

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Abstract

For the depth analysis of our territorial seismic zone, is complicated heaving in consideration that the zones appear the several tectonics discs as well as the way the energy accumulated during the process of plastic deformation is released in most of it.

The first step as a temporary technical regulation for the loads on Buildings, is used based on the basic knowledge and approved in official document FNRJ 61/48. This regulation has been used from 1948 to the 1964. The technical regulation, recommends the designer to have into consideration the horizontal earthquake loads on structure, very non as a Pre-Code without protection to seismic action. From the 1964 to 1981, is consider as a time of Low-Code, were in force the temporary technical regulations for design, computation of Building and other construction in the seismic prone on the domain of seismic intensity of VII, VIII and IX Mercalli-Cancani-Sieberg MCS. From 1981 to 1999, Structures designed and constructed between 1981 to 1999 – are with inclusion of upgraded seismic design code, Ductility based. As the most countries in Europe also the Kosova use the European standard EN 1998 for Design of structures for earthquake resistance (Eurocode 8 or EC8), which consists of six parts.

An urban neighborhood of Prishtina, built in mid-sixties of last century, is selected to implement the developed procedure, assessing systematically the potential for physical, economic and social losses from expected seismic events, complying with nationally adopted levels of risk.

More than two decades, the constructed Buildings, Infrastructure, and other work arts are sustainable, they behave in proper way without any defections' heaving in consideration the years of Live Loads.

The paper consists detail analysis from the study cases made from the previous study for the different urbane zones in Pristina.

Key words: *Earthquake, standards for structural design, code*

Optimization of the cutting and slice parameters of the Rotor Excavator SRs 1300.26/5

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Abstract

The capacity of the machines engaged in transportation and stacking, as well as utilization capacity and mineral (ore) extraction costs, are all important factors in the complicated process of exploitation from the surface. Excavators with continuous work - with a rotor - are one of the mining equipment used in surface mining, which constitutes the most important link in the continuous exploitation system: ETS (Excavator + Transporter + Stacker). In surface resource utilization technology, it is frequently necessary to make a large number of different types of decisions. Mining practice has shown that investments in mining equipment for digging - transport require significant financial resources; thus, a detailed analysis is required for the evaluation and selection of the right digging equipment to justify the investments based on various criteria. This paper will use the methodology of optimizing the technological parameters of the work during the use of the excavator with a rotor in the digging process, relying on the poly-criteria method of evaluation and selection of optimal slice and cut parameters, to evaluate the available digging machinery as best as possible. To accomplish this goal, the mathematical model must be defined so that the optimal solution can be easily found. The goal of this paper is to define the decision-making model, which entails identifying and defining the problem, analyzing alternatives, and selecting the best alternative to the presented problem. The multicriteria decision-making problem is solved by defining the decision-making matrix that is related to the possible alternatives and the decision-making criteria that have been chosen.

Keywords: *Surface Utilization, Excavation Geometry, Rotor Excavators, Parameter Optimization, Polycriteria Decision Making*

The usage of technical oxygen for fuel combustion and how it affects the rotary kiln's performance

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Abstract

Typically, atmospheric air is used in industrial rotary kilns to facilitate the combustion of fuels. All rotary kilns' combustion processes can be used with technical oxygen for fuel combustion. The horizontal rotary kiln is used as a research case for the production of sintered MgO at "MIM GOLESHI".

The study demonstrated that the combustion of fuel only with technical oxygen as a result of an increase in an adiabatic flame temperature of fuel by 830 0 C indicates on: increasing the efficiency of fuel combustion, reducing the number of gas emissions, increasing the temperature of the fuel flame and improving the stability of the fuel flame temperature, better heat transmission inside the furnace, and increasing the furnace's productivity.

As a result of technological process improvements, calculations show that sinter magnesite (SM) production increased by 897 kg SM/h or 12.55%, fuel consumption decreased by 11.834 Nm³ / T SM or 84.58 Nm³ / h or 12.55%, carbon dioxide gas emissions decreased by 39.044 Nm³ CO₂ / T SM or 279.05 Nm³ CO₂ / h, and nitrogen gas emissions were eliminated.

Key words: rotary kiln, sintered magnesite, technical oxygen, adiabatic flame temperature, etc.

Key words: rotary kiln, sintered magnesite, technical oxygen, adiabatic flame temperature, etc.

Heat transfer in district heating networks based on a thermal insulation and pipe placement approach

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Abstract

Over the years, energy production (both electrical and thermal) has been generated using conventional fuels, in ways that are unsustainable given the economic implications and the ever-growing energy demand. District heating (DH) enables the distribution of thermal energy generated in a central location, to residential or commercial buildings, to fulfill their space heating or domestic hot water demand. To improve DH systems, today we have methods summed up in the so-called "Fourth Generation of District Heating (4GDH)". One of the focal points for improving the efficiency of DH systems according to 4GDH is the proper insulation of the thermal network. Since pipes are mainly placed underground, the soil type and the water content have a significant impact on their thermal behavior.

This study presents a method for assessing the potential of heat savings in district heating networks due to thermal insulation, pipe dimensions, and pipe placement (soil type). The thermal behavior of DH pipes for different study cases is demonstrated and analyzed with simulations using the SIMULINK software.

From the obtained results, we conclude that the thermal losses of the network will increase with greater pipe dimensions, so an effort should be made to avoid large dimensions in the distribution network. Moreover, insulating layers with larger conductivity coefficients increase heat losses in the network. Lastly, in case of soil layers with high moisture content, it has been concluded that it takes a long time to reach a steady state temperature in the soil layer.

Keywords: *Efficiency, 4GDH, thermal behavior, heat losses.*

An Ultra-Wideband CPW-Fed Microstrip Trapezoidal Monopole Antenna Design for Wi-Fi and Sub-6 5G Systems

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Abstract

The wireless systems include a wide range of technologies used in numerous applications, including mobile and satellite communications, radars, direct broadcast television, and navigation. Antennas have been one of the most studied parts of these systems in recent years since they can respond to numerous wireless applications across all operational frequency bands as the demand for smaller sizes of wireless devices rises. The aim of this study is to design and analyze an ultra-wideband antenna for use in Wi-Fi 4/5/6/6E/7 (802.11 n/ac/ax/be) and 5G sub-6 GHz applications. The conductive part of the proposed antenna consists of a planar monopole trapezoidal copper sheet fed by a 50-ohm coplanar waveguide (CPW). To provide the desired frequency range and impedance matching, the area between the feed line and the conductive patch is rounded outward, and the side edges of the antenna patch are rounded inward. This structure, in which the ground element and the radiation element are on the same layer thanks to the CPW feeding method, is placed on the upper surface of the Rogers RO 40003C substrate with a relative permittivity and loss tangent of 3.55 and 0.0027, respectively. According to the simulation results, the proposed antenna has an operating frequency between 2.3 GHz and 7 GHz with a return loss of less than -10 dB. It means that the bandwidth ratio (BR) is 3:1. The gain of the antenna radiating in linear polarization ranges from 2 to 3.2 dB throughout its operating frequency. The total area of the structure is $0.72\lambda \times 0.57\lambda$. The lambda value, symbolizing the wavelength, is calculated with respect to the center resonance frequency (4.65 GHz). The proposed ultrawideband antenna is designed, optimized, and analyzed using Computer Simulation Technology (CST) Studio Suite Electromagnetic Field Simulation Software. This CPW-fed microstrip trapezoidal monopole antenna (MTMA) can be used in applications of all Wi-fi generations, consisting of Wi-Fi 4 (2.4/5 GHz), Wi-Fi 5 (5 GHz), Wi-Fi 6 (2.4/5 GHz), Wi-Fi 6E (6 GHz), Wi-Fi 7 (2.4/5/6 GHz), and 5G mobile networks, including sub-6 GHz frequency bands (0.41 GHz–7.125 GHz).

Key words: *Ultra-Wideband Antenna, Wi-fi Applications, Sub-6 5G Systems.*

The impact of ERASMUS+ projects on Higher Education Institutions (HEIs) in Kosovo

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Abstract

This paper presents a holistic approach by analysing the main impacts of ERASMUS+ projects on Higher Education Institutions (HEIs) in Kosovo through the experience and theoretical expertise of involved students and staff. The paper has two integral parts: the first part will be covering findings on the type of ERASMUS+ projects implemented in Kosovo and their contribution towards advancing and modernizing higher education sector; while the second part of research paper will be dedicated to the impact and the importance of internalization at the institutional level in Kosovo HEIs. The second part of the paper will also present findings of the research conducted with the aim to analyse the impact of student and staff mobilities as a crucial component of internationalization process in Kosovo HEIs. The results from a holistic approach used in the paper include teachers' and students' own experiences, familiarity with the pedagogical model, and inputs from students and partners involved in implementing ERASMUS+ projects in Kosovo. This element prioritizes internationalization in Kosovo's education system as a process of transformation during which faculty leaders and teachers adapt the universities to be fully functional in an international context. ERASMUS+ projects play a crucial role in acquiring European Higher Education standards to all HEIs in Kosovo education sector. Such standards were mandatory prerequisite for accessing European Higher Education Area. This process began even before launching Erasmus+ programme and it was part of previous education program schemes by European Union, but most significantly under the framework of Tempus Programme. The Erasmus+ programmes have strong international dimension designed to enhance cooperation between partners' countries, primarily in the field of higher education through youth actions, mobilities and institutional partnerships. In the end, the paper shares the results of international project run at a few Kosovo universities through the cooperation with national, regional and EU stakeholders and with the engagement of teachers and students as partners with the best practices in implementing international relations.

Keywords: *International relations, higher education system, best practices, internationalisation, capacity building*

Toward increasing efficiency in wind farms, case study: Zatriq

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Abstract

Kosovo continues to face a major energy crisis that requires a quick response. All over the world, various energy technologies are being tested that enable green production and created by current technology. An overview of the coverage of energy needs in Kosovo shows that over 95% of energy is from coal. The rest is covered by a combination of hydropower, wind and solar power. On the other hand, the energy strategy of the Republic of Kosovo envisages about 700 MW of wind farms. In the wind energy sector, various wind farms have been developed throughout the country, but in each case there is a possibility to allow the layout of the turbines in such a way that the energy output increases. In the case under consideration, there is a wind farm in a mountainous country, in Zatriq, where the wind farm with a potential of 35MW is analyzed, in the context of finding the best possible configuration. This configuration is analyzed in the context of the output energy and capacity factor that is achieved. The model created here will serve as a reference model for other wind farms that will be built in Kosovo in the context of increasing energy output.

Key words: *energy, environment protection, students, rural community, energy savings.*

The study of the level of furniture dimensions compatibility with anthropometric measurements – Case study

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Abstract

Providing suitable environments for sitting in the chair and comfort during educational activities at the work desk is a prerequisite for educational institutions in general. In this aspect, special attention should be paid to children who attend pre-primary and pre-school education in the relevant institutions. This is because many researchers have concluded that a bad posture of the children can show health problems and stagnation in the education process.

The paper aims to determine the level of compatibility of furniture (chair and table) with the anthropometric dimensions of children aged 3-6 years in the municipality of Prizren.

For the realization of the work, measurements were made of 210 children in public and private pre-primary and pre-school institutions.

Field measurements include 13 body parts needed to determine furniture dimensions.

The findings of the study indicate a high level of non-compliance of furniture with anthropometric dimensions in all the institutions studied.

Key words: *furniture, children, mismatch, design.*

Biomaterials and sustainable buildings

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Abstract

Today, sustainable construction is taking large proportions in practice, as evidence of this, many world organizations stand out, which focus on achieving the objectives of Sustainability Development. Based on the fact that these objectives are the preservation of the planet earth for this generation and the preparation of this planet for future generations. This foresees that the design of buildings should be based on three parameters: social, ecological, and environmental. These parameters must be combined in the design of sustainable buildings, and in particular in respect of building materials, offering primacy to biomaterials.

These are also the goals and researches of this work, which will be done with a focus on bio materials and their application in construction buildings, in addition to respecting the dimensions of sustainability development. Bio materials, with particular emphasis on autochthonous materials, known and used since ancient times in the Balkan countries, which can be easily found, taken advantage of, transported, put into operation and then recycled for other uses, for example we have: wood, soil, coal, organic cotton, plant waste, stone and many others. The research methods used in this paper are: analytical, synthesis, statistical, generalization. The steps followed to carry out this research have started from field research for the current state of buildings in the territory of Prishtina, studying and analyzing the inclusion of bio materials in existing buildings, but also the disposition of architects and engineers in the design of buildings with bio materials, also taking into account the citizens' opinion about the importance of bio materials in buildings.

From this research it can be concluded that the importance of bio materials as sustainable materials was known even in ancient times, as evidence we have the old buildings built in the country with different bio materials and which still maintain their stability. Comfort and unity with nature and also tend to be revised and maintained. It can also be said that bio materials will continue to be used in construction in the near future, and with the help of the latest technological achievements it is possible to make some improvements in their physical-mechanical structure, as well as to make some combinations of bio materials among themselves, to offer a more elegant aesthetic to the object. Usually, the materials that can be combined with each other are materials that are taken directly from nature and that enable the creation of products with good thermal, acoustic, fire-resistant, and weather-resistant performance. In these combinations, some materials play the primary role and some others serve as additives to bind these elements to form the product.

Key words: *Sustainability, Development, Facade, Environment, Efficient Energy*

Enhancing Burp Suite with Machine Learning Extension for Vulnerability Assessment of Web Applications

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Abstract

Today's web represents the most extensive engineered system ever created by humankind. Web security is critical to web application providers and end-users. Burp Suite is established as a state-of-the-art and fully featured set of tools for web vulnerability scanners. This paper presents a novel approach using state of the art Machine Learning algorithms applied to the Burp Suite extension. These algorithms were used to scan for: SQL injection, Cross-Site Request Forgery, and XML External Entity vulnerabilities in university web applications. The results show that the best algorithm is Long Short-Term Memory and that the targeted website is safe to use.

Key words: Burp Suite; machine learning algorithms; extension; web vulnerability

Restoration and use of buildings with historical and heritage values with a focus on sustainable architecture and smart techniques

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Abstract

The success of interventions for the restoration and reuse of old buildings with special values depends on creative vision, architectural solutions, the interaction of the functional side with the aesthetic dimension, and the new proposal that is presented. This process is of a certain degree of difficulty and requires the strict observance of several principles, norms, and laws so that the proposed design does not affect the loss of the building's identity. Today, reuse is accepted as an important approach in sustainable urban development architecture or smart architecture.

The paper aims to implement professional interventions with a focus on smart techniques and ecological materials, as sustainable architecture development models. Data were collected through purposive sampling; non-probability sampling approach.

Data analysis and findings show that there are efficient methods that preserve the space, core, and identity of the building. They improve the functionality, of the aesthetic dimension and conform to the new architectural development trends.

Practically, they bring the revival of the interior environment; enrichment with new systems, digitalize and adapt it for new functions: in coherence with the latest developments, and new trends, but without losing its original identity.

Keywords: *buildings, identity, sustainable smart architecture.*

Using standardized environmental declarations of building products for a more sustainable construction and renovation of buildings

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Abstract

Circular economy is considered a prerequisite for achieving climate neutrality in European Union by 2050. The goal of focusing on circular economy is to reduce the consumption of natural resources, sustainable growth and create jobs. In 2020 the European Commission adopted a new Circular Economy Action Plan (CEAP), which forms the basis for sustainable growth agenda — the European Green Deal. The Action Plan envisages improving products throughout the life cycle, by developing circular economy products and processes, encouraging sustainable consumption, preventing waste generation, and retaining ingested resources within the EU economy for as long as possible. The strategy “Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives” was published by the Commission in 2020 to boost renovation in the EU. The European target is to double the rate of renovation of buildings over the next decade. Amendments on Energy Performance of Buildings Directive (2018/844/EU) of the European Parliament and Council were adopted in March 2023. The aim of the amendments to the Directive is to accelerate the efforts under the Renovation Wave. On average, construction and demolition waste (C&DW) accounts for more than 30% of waste at EU level. The so-called “Fit for 55” European legislative package refers to achieving a binding greenhouse gas emissions reduction target of at least 55% by 2030, compared to 1990 levels. Environmental Product Declarations (EPD) are transparent and objective reports on the environmental impacts across the entire life cycle of products (LCA, Life Cycle Analysis). Architects and construction engineers need verified EPDs to assess the sustainability level of new or renovated buildings. The presented research shows the application of ISO 21930:2007 standard “Sustainability in building construction — Environmental declaration of building products” for the development of EPDs for concrete pavements by using LCA software. The impact of different environmental categories was assessed. It was found that the fossils resource use has the highest environmental impact. It was concluded as well that the construction sector is currently lacking familiarity with the LCA terms and concepts, which will certainly be required very soon to be standard practice.

Key words: *life cycle analysis, environmental product declaration, construction, building, renovation.*

The Role of Cybersecurity Awareness in Cyber Resilience

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Abstract

Modern technology continues to change our lives in countless ways. While there are many advantages to incorporating technology into daily life, it also makes us more vulnerable to attacks and expands our attack surface. Therefore, the number and complexity of cyber-attacks are increasing every day. Although significant public and private sector investments are made to prevent cyber-attacks, some of the cyber-attacks cannot be prevented. When this situation in the field is closely analyzed, it is seen that the errors are caused by human beings. The human factor remains the "weakest link" in cybersecurity. To avoid this situation, technological solutions must be combined with appropriate human cyber security behaviors. In this study, we examine the effect of cybersecurity awareness on cybersecurity compliance behavior. A conceptual model was developed in the context of protection motivation theory and tested with a dataset containing survey results from employees. Regression analyses were conducted to evaluate the impact of employees' cyber security awareness on their cyber security compliance behavior. As a result of the analysis, it has been observed that the cyber security awareness of the employees positively affects their cyber security compliance behaviors. The literature has been expanded by examining the concept of cybersecurity awareness within the framework of protection motivation theory. With this new perspective, suggestions for practical applications have been developed. The study emphasizes the importance of cyber security awareness in fostering the cyber resilience of institutions against attacks and offers suggestions for theory and practice.

Key words: *Cybersecurity Awareness, Protection Motivation Theory, Cyber Resilience.*

8. Social Sciences and Human Rights

Exploratory Study of Posttraumatic Growth Among Parents of Children with Autism Spectrum Disorder in Kosovo: Contribution of Strengths

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Abstract

Recent research has highlighted that parents of children with autism spectrum disorder (ASD) often experience a significant burden and struggle with their mental health. However, a more nuanced understanding of the overall care experience of ASD caregivers has shown that caring for children with ASD can also have positive aspects, to varying degrees, for parents. Despite this, the majority of studies exploring the experiences of posttraumatic growth (PTG) among parents with ASD have been conducted in western and developed countries, leaving a gap in understanding of PTG in low and middle-income countries, like Kosovo. To address this gap, this study follows the resilience portfolio model and aims to explore the PTG among Kosovo parents and the contribution of strengths. The study used a cross-sectional research design and involved 69 parents with ASD. Participants completed the Posttraumatic Growth Inventory and resilience portfolio measures of strengths, including regulatory, meaning-making, and social support strengths.

Findings showed that PTG is positively associated with resilience. Moreover, specific strengths, such as coping, endurance, optimism, compassion, and support from intermediate family members, are positively associated with higher levels of PTG. These results suggest that PTG plays a protective role in the mental health of caregivers of ASD in Kosovo by enhancing compassion, optimism, and family support. Based on these findings, future research may consider strengthening interventions to enhance PTG in caregivers of children with ASD in Kosovo. Additionally, healthcare professionals that work with parents may focus their interventions on these aspects of strength to facilitate resilience.

Keywords: *Autism Spectrum Disorder, Resilience, Posttraumatic Growth, Kosovo, Parents*

COVID-19 Impact on Social Service Providers and Children and Family Beneficiaries: Psychosocial Focus

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Abstract

Addressing the psychosocial needs of beneficiaries of social services is an integral part of the everyday work of social workers in Kosovo. However, these are often overlooked, or service providers lack the knowledge and skills to address them. This study presents the mixed method results of a survey conducted with social service providers (n=101) and 20 focus groups with vulnerable children (n=45) and parents (n=80), beneficiaries of social services, intending to assess the psychosocial needs of beneficiaries and the capacities of providers in offering these services. Social service providers were Centers for Social Work and licensed non-governmental organizations for social services. Quantitative and qualitative data indicated: 1) COVID-19 pandemic significantly negatively impacted the well-being and functioning of vulnerable children and families who access the social assistance scheme. Specifically, children, adolescents, and parents interviewed reported significant financial and mental health strains, including high levels of anxiety, stress, and fear during the pandemic, as well as difficulties with online learning due to a lack of IT equipment, stable internet connections, and unclear instructions. The pandemic also negatively affected the well-being of social workers, many of whom felt overwhelmed and reported burnout by increased work responsibilities; 2) Social workers, in terms of prioritizing the training needs, identified the following areas as a priority: substance use and abuse, child protection, psychological first aid, suicide prevention, and child delinquency, and violence, including domestic violence. Findings also provided insight into the primary services delivered by social workers, challenges in everyday work, and the perspective of social workers on main mental health problems and strains experienced by service beneficiaries. The training needs of social workers were addressed by the development and implementation of training 4 modules (Work with users of psychoactive substances and cases of delinquency; Mental health and case management and referral; Developmental Psychology; and Psychosocial services and counseling skills) from which 210 social workers benefited. The study discusses the need for continuous education, training, and professional development of social welfare services providers in the provision of psychosocial services that extend beyond the COVID-19 period as an integral part of their services.

Keywords: COVID-19, Social Services, Psychosocial needs, Children/Families, Kosovo

Constitutional and legal aspects of the Kosovo Specialist Chambers

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Abstract

The Kosovo Specialist Chambers (SC) and the Specialist Prosecutor's Office (SPO) were established in the context of the necessity of fulfilling international obligations. Considering the legal specifics and the circumstances in which they were established, the SC and SPO represent a case of interest for study.

The establishment of the SC and the SPO was preceded by the amendment of the Constitution of the Republic of Kosovo and then the Law on The Specialist Chambers and the Specialist Prosecutor's Office was approved. This law emphasizes specific articles in the Constitution of Kosovo and states that the SC are an integral part of the court system in Kosovo. However, the SC and the SPO have their own specifics of functioning which are addressed / regulated under this law by presenting the relationship with other laws.

The comparative analysis of the SC and the SPO and other international tribunals shows some similarities but also specifics. Among the specific circumstances under which the SC were established is the fact that the developments which are considered as failure of UNMIK (United Nations Mission in Kosovo) and EULEX (European Union Rule of Law Mission in Kosovo) missions have influenced and preceded the establishment of SC.

Although the preparatory process for the establishment of the SC and SPO has considered the previous experience of the functioning of international courts aiming at a flexible institution and adapted to the context, the establishment of the SC and SPO has been accompanied and continues to be accompanied by intense debate. From the analysis of the available data and information, it can be concluded that the main concerns that dominate the debate as a whole (about SC and SPO) are those related to bias (targeting only one ethnic group) and the concentration of authority.

Key words: *Specialist Chambers, Specialist Prosecutor's Office. Legal aspects, Constitutional aspects, Kosovo*

Psychosocial Needs Assessment of Returned Migrants and Refugees in Kosovo: Current Practices and Suggestions for Improvement

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Abstract

Kosovo, in recent years, has experienced challenges in various levels of service provision with waves of returned migrants from EU and an increase in the number of refugees transiting the country. This paper focuses on the often neglected aspect of the psychosocial needs of these populations in Kosovo. The study analyzes the existing psychosocial and economic (re)integration system for assessing and profiling the psychosocial needs of returned migrants and refugees. Qualitative in-depth interviews were conducted with eleven key stakeholders from national and local institutions and NGOs to gain in-depth contextual information. Two focus group discussions and four individual consultations followed findings from interviews with key stakeholders. Data analysis of the transcripts applied a content analysis approach. Results are organized as following 1) a simple visualization of the "institutional/organizational journey" of the returned migrant in Kosovo; 2) an analysis of currently used forms and perspectives of officials on current form and proposal of new and revised forms; 3) an analysis of the training and capacity-building needs of service providers regarding psychosocial services for the populations in focus and proposing modalities to address identified needs; 4) specific policy recommendations for service providers. Building the capacity of specific service providers in Kosovo to assess and address the psychosocial needs of returned migrants, refugees, and asylum seekers are essential, particularly given the potential for unexpected population movements due to man-made and natural disasters.

Key words: *repatriated persons, refugees, psychosocial needs, assessment forms*

Growing up Between Two Cultures: An Ecological Model Approach of Ethnic Identity Development among Adolescent Immigrants

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Abstract

The purpose of this study was to review the factors that affect the ethnic identity development of immigrant adolescents. Research showed that ethnic identity has become a more salient issue for ethnic minority adolescents than for the members of the ethnic majority. The issue of ethnic identity was particularly prominent with adolescents whose parents were immigrants. Ethnic identity was defined as a “component of awareness, self-labeling, attitude and behavior that results in individual’s identification with a particular group as well as the emotional attachment to that group”. Ethnic identity and academic success in immigrant adolescents were positively associated with positive self-esteem of immigrant adolescents. Adolescents who came from immigrant families tended to have problems with adapting into the new culture while still keeping their old culture. Within the ecological framework of development, the roles of identity formation together with the individual’s beliefs, values and social behaviors were greatly influenced by individual’s personal, social and cultural contexts. This article provides a review of theoretical and empirical work on ethnic identity among immigrant adolescents, and, guided by the cultural ecological framework, an ecological framework.

Keywords: *adolescence, immigrations, ethnic identity, acculturation, adaptation*

The Influence of Internal Political Circumstances in Yugoslavia on the Advancement of the Economic Position in Kosovo between 1966-1974

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Abstract

The political circumstances in Kosovo after the Second World War were extremely unfavorable for the Albanian population in Kosovo. The oppressive politics of Yugoslavia also dictated the economic development of Kosovo for the period 1945-1966. This time is known in Yugoslavia and Kosovo for the brutality exercised towards the Albanian population, led by the Minister of Internal Affairs, Aleksander Ranković, who was in charge of the repressive body named: State Security (secret police). This service persecuted and tortured Albanians, especially the patriotic and intellectual class. In July 1966, at the 4th Plenum of the Communist League of Yugoslavia in Brioni, a long meeting was held where the crimes committed by Rankovic were condemned. After the removal of the latter, from all political functions, the circumstances became more favorable in all spheres of life in Kosovo. Yugoslavia started a new more inclusive and liberal policy towards Kosovo, helping it to develop first in economic terms. The study presents the influence of the Yugoslav politics on the difficult path for raising the economic capacities of Kosovo. The author has carefully used synthesizing, descriptive, comparative methods in analyzing this issue. The study represents a contribution as it has not been specifically addressed in detail in papers or monographs by different authors.

Key words: *Economy, Kosovo, Serbia, Yugoslavia, Liberalization.*

Employee Retention in the Wake of Migration Crisis: Rethinking Organizational Strategies and Policies

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Abstract

Migration opportunities are perceived as an incentive for many (un)satisfied employees to leave their workplace. The remaining job seekers enjoy more employment opportunities and greater bargaining power for better working conditions which may ultimately lead to employee satisfaction and greater work autonomy. The objective of this study is to investigate the role of work overload and autonomy on job satisfaction, organizational commitment, and turnover intent among employees in selected industrial sectors in the wake of migration. The Job Demands-Resource (JD-R) model is used to examine the relationship of work overload as job demand and autonomy as job resource with job satisfaction, turnover intent, and organizational commitment. The study uses a cross-sectional quantitative approach with one-hundred and fifty respondents from different industries in the Republic of Kosovo. The findings reveal (1) a negative effect of work overload and a positive impact of autonomy on job satisfaction; (2) job satisfaction negatively affects the turnover intent; and (3) job satisfaction has a positive effect on organizational commitment. In line with the theoretical framework (Doi, 2005; Halbesleben & Buckley, 2004) this empirical evidence shows that job demands, and job resources play a crucial role in determining employees' job satisfaction and their intentions to leave or remain in the organization. Considering the increasing level of migration which serves as an additional incentive to leave organizations, the study suggests that employers should consider multiple strategies centred on the increase of employees' job satisfaction, reduction of work overload and increment of autonomy.

Key words: *Migration, job satisfaction, Job Demands-Resource model, autonomy, organizational commitment.*

Factors influencing youth mental health and wellbeing in Kosovo

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Abstract

Youth mental health is an important part of their wellbeing. Mental health of young people is affected broadly by several factors, including contextual and individual factors, during different period of young people's life. The aim of this study was to examine the mental health and wellbeing of young people in Kosova in relation to information young people receive for mental health. In addition, youth resilience was observed as a facilitator of youth wellbeing and enhanced mental health. Gender differences were also observed in relation to forms of information, mental health, wellbeing and resilience. The study adapted a cross-sectional design, in a sample of 281 young participants aged between 12-24 years ($M=18.14$), with 70.8% coming from female participants.

Results show that young people who followed more often medias and the daily news in mental health related issues, they manifested less clinical symptoms of mental health problems and the results were significantly different, $p = .010$, $X = 13.301$. *Similar results were found* about the wellbeing of young people who followed more often medias and daily news, which resulted to their higher wellbeing, with $p = .016$ and $X = 12.166$. That information was confirmed also by Anova analysis. While we are talking about the resilient factors and relation to mental health and wellbeing, it is clearly stated that resilient factors such as family connection, school connection, community connection, participating at school and home, self-esteem, problem solving and goal aspiration are positively correlated with Well-being and negatively with mental health problems. In regard to gender differences it was not found any significant differences between male and female according to mental health and well-being. According to the results it seems that being informed from the media in mental health issues and maintaining higher results in the resilient factors it is a protective factor for mental health and well-being.

Key words: *Mental health, infodemics, resilience, wellbeing, youth*

The role of UNIDROIT Principles in the interpretation of the CISG: Recent developments of UNCITRAL and HCCH in harmonization of these instruments

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Abstract

The paper refers to two basic instruments of the international trade law and contractual relations in the international sale of goods. Their adoption was preceded by a long history and a strong commitment and a major goal on the part of the Member States to establish and unify the rules in the field of contract law. These two different legal documents share the same purpose and complement each other. Particularly, the paper examines the special role of the CISG as an "international code" in international sales of goods, including the importance of the CISG as an international convention. However, some of CISG provisions leave a lot of room for interpretation. Use of the UNIDROIT Principles as auxiliary tools to interpret and supplement the CISG provisions, is deemed necessary. In this regard, the paper aims to identify and analyse in detail some CISG gaps and provisions that require interpretation, as well as the role of UNIDROIT Principles in bridging and interpreting those gaps. The paper encompasses and analyses the recent outcomes of the Hague Conference on Private International Law, the United Nations Commission on International Trade Law and the International Institute for the Unification of Private Law of 2021. For several decades, the Hague Conference on Private International Law (HCCH), the United Nations Commission on International Trade Law (UNCITRAL) have been preparing uniform law texts that promote the progressive harmonization and modernization of commercial contract law. Their achievements are intended to clarify the relationship among the texts with a view to promoting their adoption, use and uniform interpretation and, ultimately, the establishment of a predictable and flexible legal environment for cross-border commercial transactions based on the principle of freedom of contract. In this case, and in addition to these, the paper goes further by elaborating each situation and the problems in their acceptance by the parties and national courts.

Keywords: *International sales, international contract, CISG, UNIDROIT Principles.*

The Body as a Social Construct: The Kosovan Context on ‘Beauty’ and ‘Look’ from the Perspective of Women and Girls in Kosovo

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Abstract

The inclusion of the study of the human ‘body’ in sociology ruined the view that ‘nature’ constitutes the absolute premise that explains human interactions and social phenomena. The sociological perspective offered a new project of conceptualising the body, which enabled its reshaping and modification. In the new context of understanding the body, “the life of the body” was transformed from a technical and reproductive mechanism into a way of living and identity. This paper “The body as a social construct: the Kosovan context on ‘beauty’ and ‘look’ from the perspective of women and girls in Kosovo” aims to address the main theoretical approaches to the study of the body, which at the same time reveal the context of the social realities that built the epistemology of the sociological and gender studies in the research of issues related to the body. The paper introduces the results of an empirical research carried out with women and girls in Kosovo regarding the understanding and appreciation of the body; their position about the body image that will help deconstruct the standard of the idolised body of women and girls in Kosovo. Therefore, this research carried out with women and girls in Kosovo aims to highlight their attention and sensitivity towards the ‘beauty’ predefined by the social, cultural, and economic context. The body image and its appreciation are ever-changing concepts and have a profound effect on everyday life and the way of living in general. The body issues, the discipline and control of the body, reconstruction of the body through modification, and portrayal of the bodies in the mass communication culture compose the four central aspects that will be addressed to find out the views of the Kosovan women and girls regarding the understanding of the body and of the social construct of the ‘ideal body’.

Keywords: *body, sexuality, patriarchy, beauty, moral.*

Analysis of Historical Texts in the Schools of the Republic of Kosovo

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Abstract

The aim of this research is to know up to what level history textbooks present the real, factual situation, discriminatory language, and even the last war in Kosovo. To realize this research, have been used several methods and techniques. The methods that are used in this research are as follow types such as theoretical and empirical in nature. Also used methods, are deduction method, analysis method, comparative method that have been used. In the methodology, two techniques have been applied: the standardized questionnaire through the Liker scale, as well as interviews of two open questions with history teachers, and their answers are included in the results. So, the methods were combined, quantitative (questionnaire) and qualitative (interviews). The questionnaire is compile up with six questions and the students answer about them with statements or attitudes, depending on the degree of maximum agreement ("I completely agree", "I agree"), the moderate degree of agreement and disagreement ("Yes and no"), as well as the degree of opposition ("I do not agree at all", "I do not agree"). With the help of teachers, 30 students from different schools were selected to complete the questionnaire. The search was made directly in the history texts. As a sample in this analysis, the old and new history textbooks, which include grades 6-12, upper secondary and elementary school levels, were taken. With this research, we conclude that the authors of history textbooks in republishing should not use excessive historical dates, but use only those years that are necessary, not show ethnic and racial hatred, but cultivate more harmony and human tolerance. This is achieved when MASHT organizes a Focus Group, in which local and foreign experts, history teachers, civil society, historians, media are invited to participate in order for these texts to show the historical truth, based on documents.

Keywords: *analysis, history texts, Republic of Kosovo.*

The effect of Intrinsic motivation on Extra-role performance

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Abstract

Intrinsic motivation is defined as a spontaneous activity performed for intrinsic gratification rather than extrinsic factors or separate rewards. A person is said to be intrinsically motivated if they engage in a task for intrinsic gratification.

Nowadays, the concept of intrinsic motivation of employees at work is extremely important, so special attention is being paid in the fields of business, psychology, and employee performance.

Intrinsic motivation is especially important because it is one of the primary determinants of employee performance at work.

Extra-role performance refers to behaviors and voluntary actions that an employee undertakes to perform work and tasks that go beyond his job description. These activities are known as organizational citizenship behaviors (OCB) and include activities such as helping colleagues as well as the willingness to perform tasks and tasks that are not within their job description.

The main purpose of this study is to determine the effect of intrinsic motivation on extra-role performance. Participants in this study are from public companies in Kosovo that operate in the postal and telecommunications sectors. To test the hypotheses of the study, the SPSS program was used, Correlation and hierarchical regression analyzes were used to investigate the relationship between study variables. The data for this study were gathered from 394 employees of the public enterprises Posta and Telecom of Kosovo who work in various managerial positions as well as in various municipalities throughout Kosovo.

The findings showed that all three sub dimensions of Intrinsic motivation (autonomy, relatedness, and competence) have positive effect and increase Extra-role performance.

Keywords: *Intrinsic motivation, Job performance, Kosovo*

Parenting Styles and Teacher Interaction on Self-regulated Learning and Academic Performance

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Abstract

Numerous studies have identified the importance of parenting styles on self-regulated learning and academic performance. Interaction with teachers is also an important factor in academic success. In this regard, the present study aimed to identify the correlation of parenting styles and interaction with teachers with self-regulated learning in students and whether self-regulated learning predicts academic performance. The research was conducted with 420 students (7 and 8 grades) from five primary schools in the municipality of Drenas, Kosovo. Students were selected with a random cluster sampling method. Data collection was carried out through a survey with a self-administered battery of questionnaires. The results of the study show that the authoritative parenting style and cooperative behaviors of teachers was positively correlated with the self-regulatory strategies in learning. There was a negative correlation between the authoritarian and tolerant parenting style as well as the dominating behaviors of teachers with self-regulated learning strategies. Self-regulated learning was positively correlated with academic success.

Key words: *self-regulated learning, teacher interaction, parenting styles, academic performance.*

Spatial protection of ethnic/national minorities: the contested concept of “nationally mixed areas” in Slovenia

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Abstract

In its constitution, the Republic of Slovenia explicitly recognizes three national or ethnic minorities. While Hungarians and Italians are recognized as the “autochthonous” national minorities with special rights, the Roma population is recognized as the “Romany community”. This clearly ambiguous approach partly stems from the time of making the constitution for newly independent Slovenia in 1991, though this particular differentiation is older. Other national or ethnic groups are not explicitly constitutionally recognized although some of them bear the potential to be equivalently addressed. The article discusses the origins of the specific arrangements for protection of ethnic or national minorities in Slovenia, especially its spatial or territorial approach to this protection. Through the comparison of the contemporary setting of spatial protection for the Hungarian and Italian minorities, in contrast with that of the Romany population, the article analyzes the possibilities for applying such an approach to other ethnic minorities in Slovenia. It furthermore addresses the conceptualization of the so-called nationally mixed areas (NMA) and its long-term suitability for evermore migratory populations. Moreover, applying the concept of autochthony, the minority area is further reduced to the point beyond the constitutional sense of minority protection. For example, within the “nationally mixed area” in the Slovenian Istria resides only about a third of the “autochthonous” Italian community members of Slovenia. On the other hand, some half of the “autochthonous” Hungarian community members reside in the “nationally mixed area” of Prekmurje in NE Slovenia. Making use of various census data dealing with ethnicity, religion and language, the concept of “nationally mixed areas” is applied for Croats, Serbs and Germans in Slovenia. The results show that it is not possible to define such an area for Germans. On the contrary, the contiguous areas are definable in a smaller extent for Serbs and in a larger extent for the Croat national community in Slovenia.

Key words: *ethnic minorities in Slovenia, nationally mixed areas, Slovene-Croatian border area, human rights*

Phenomenology of deviant behaviors in elementary schools in Kosovo - case study of the municipalities of the Dukagjini region

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Abstract

The phenomenology of deviating behaviors is not new this to us, it is present in every culture and every society, including Kosovo society. In recent years, such behaviors, but also delinquency, are present in school environments more than before. While education is considered one of the main agents or factors of socialization, deviant behaviors in school environments have turned into routine phenomena, a real problem, which is having effect in reducing students' performance, causing psychological confusion, as well as endangering the school environment, making people feel unsafe. School officials, parent councils, professionals from the field of social sciences, central and local governmental institutions, security organisations and others, are in close cooperation and coordination to find effective forms, methods and solutions to help minimize this issue. This paperwork aims to research and analyse the phenomenon of deviant behaviours in low-cycle (elementary and junior high schools) schools in Kosovo with the focus of municipalities in the Dukagjini region. The work also discusses causes and consequences, as well as gives suggestions on ideas and forms of exit from such situation, creating a safest social environment for students. The working methodology applied during this work was focused on literature review, desk research, content analysis, statistical analysis, and the development of an empirical research in the municipalities of the Dukagjini region. Research has been conducted with students of elementary and junior high schools with both genders, age range from 10 to 16 years old and a sample of 500 respondents. Overall research results show that about 11% of respondents were victims of attacks in the schools, in other questions we have seen that about 38.8% were victims of physical attacks and 47.4% of them were victims of psychological attack, then most of them or 25% claimed to have been harassed by friends and another 25% claimed to have been attacked by others outside school. In general, school as an institution should also be a safe environment, a safe refuge for students, so them to feel same in psychological, social and cultural aspects, to encourage them to achieve higher performances at school, create better and healthy interpersonal relations and well to prepare them for life.

Key words: *Deviant behavior, education, school, causes, Kosova.*

Quality in education as a measure for the development of the state

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Abstract

Education is one of the areas that is discussed in every society and this discussion happens all the time. This is because the development of societies happens precisely on the basis of a good and quality of education. The higher is the quality of this education, the faster is the development and even the transformation of societies, even our society. However, in practice it happens that a discussion on education does not mean that governments, starting from the central to the local level governments have as priority the education and on the basis of this priority to decide adequate measures for the development of a quality education on their institutions. This paper will try to explain how important it is to approach that the priorities for a higher quality education become such with support plans, especially in financial terms. This paper will present a paradigm in the case of Kosovo, where all Kosovo governments without distinction since the declaration of independence of Kosovo have given priority to education, while on the other hand the allocation of the budget for education has been ridiculous. Therefore, this paper will rightly bring to the reader how important it is for the state not only to prioritize education, but also to support it with strategic plans, and above all in financial terms, because prioritizing the education only in strategic documents with no further actions means a big failure towards the quality in education. And if this does not happen, then surely quality of education will be lacking, and with it will lack the results, especially the international results, as is the case with the PISA results.

Keywords: *Education, quality, transformation, societies, financial, priority.*

Analysis of the democratic theories: Where do the Nordic Countries fit?

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Abstract

This paper includes an analysis of the Nordic political systems, more specifically on how the Nordic countries have created a government system, with foundation-based democratic values while including different social and economic policies that are distinct from other Western democracies, such as the United States. Democratic theory is not a theory that can be adapted to every society in the same way. It is deeply influenced by the environment it exists in. As such, the Nordic Model is an interesting model to analyse when the topic of democratic political systems is brought forward. This paper includes a literature review of democratic theories that were present historically and in the modern world, such as classic democracy, liberal democracy, post-liberal democracy, and modernized democracy. The paper also analyzes and compares these democratic theories to the Nordic political models, while also comparing it to the United States democratic model. Key findings of the paper include the main differences between “social democracies” and liberal democracies, mainly focusing on social policies while keeping the main philosophical liberal views as a core structure of the whole political system.

Keywords: *democracy, Nordic countries, political systems, Western democracy.*

The Protection of Jews in Albania before and during WWII: Social and Economic Status of the Rescuers

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Abstract

The Holocaust or the Shoah was the systematic persecution and killing of more than six million European Jews by the Nazi German state and its collaborators. The Holocaust era began in 1933, when Adolf Hitler came to power and ended in May 1945, when the Allied Powers defeated Nazi Germany in World War II (WWII). Only one in three Jews living in countries under the occupation or influence of Nazi Germany survived WWII. Albania was one of the most devastated countries after the war: nearly 30.000 Albanians were killed, hundreds of villages and towns were destroyed, and tens of thousands of people were left homeless. On the other hand, Albania was the only German occupied country with more Jews after WWII than before it. This research is focused on the socioeconomic status and other particular characteristics of Albanian rescuers. The study is based on the digital files of the Righteous Among the Nations Database at Yad Vashem, archival documents of AQSH (Albanian Central State Archive) and on other numerous secondary sources. Albanians saved almost all the native Jewish community, and assisted thousands of Jewish refugees from other European countries. Jews were helped by ordinary Albanians, regardless of their religion, profession, economic situation or place of residence. The main motivation of the rescuers was Besa, a pagan tradition which originates from Illyrian tribal laws.

Key words: *Holocaust, Albania, rescuers, economic status.*

Let's get numeric: Explaining Political Science student preferences for a quantitative orientation of their studies

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Abstract

The global push to orient Political Science university studies toward a data science approach lacks the necessary research to scholarly explain its predictive factors and normatively support such new orientation. Much of the academic and pedagogical debate related to a numerical turn of Political Science studies focuses more on proposing ways to alleviate student math and statistics anxiety during research methods courses rather than a conscious effort toward training students to operate with big data and computational applications to collect and analyze them. Also, even that existing debate has been overwhelmingly driven by instructors, relying on their experiences and perceptions rather than student preferences. By taking our research in Southeastern Europe, we try to predict Political Science students' preferences for empirical, statistical, mathematical and computational orientation of their university studies with three batches of variables: digital literacy; preferences for a practical, research, and historical orientation of Political Science university studies; and their perception for career usefulness of research design, statistics, and mathematics. We found that strong preferences for practice- and research-oriented PS studies predict preferences for ESMC orientation of such studies, but that association grows weaker with students progressing over semesters in their studies.

Keywords: *empirical Political Science, mathematically-oriented Political Science, Political Science statistics, computational Political Science, history-oriented Political Science studies*

Digitalization of notarial system as a precondition for rule of law and human rights in Kosovo

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Abstract

In Kosovo, the notarial system was established in May 2012. The system is based on the most developed systems of civil law tradition. The technology has almost transformed since 2012, but such a transformation is not reflected in the notaries' work.

A disadvantage of Kosovo's notarial system exists in the lack of digitalization of notarial services for citizens and businesses and the lack of legal interaction with public institutions regarding the exchange of data. To be more concrete, the notaries have no direct access to the central state registers, such as are land register, civil status register, or pledge register. Such a lack of access has created different challenges and legal uncertainty. Consequently, the different types of fraud in concluding notarial acts are present due to the lack of access to state registers. Furthermore, for every simple action, the presence of the parties in the notarial office is required as a lack of electronic signature. Finally, from a comparative law perspective, there are recognized systems that can be taken as an example concerning digitalization (i.e., Germany, Austria, Estonia, etc.).

Transforming the notarial services through digitalization will have an impact in several directions. As a starting point, the access of notaries to the public registers will increase legal certainty, directly affecting the protection of the rights of citizens and businesses and contributing to the economy. Additionally, digitalization will increase the efficiency of the notarial services without being necessary for going to several offices to gather documents before taking the notarial services.

This article is mainly based on applicable laws and a literature survey. To answer the question raised in this research, several different rules apply to the activities of notaries, and the function of public registers is reviewed. The results of this article in the framework of the digitalization of notary systems will be used to illustrate the importance of the digitalization of notary systems to improve public services and prepare future legislation. For this purpose, the conclusions of this article will be delivered as recommendations to the local authorities, based on which can be taken measures to improve the connection of the notarial system with other public services electronically.

Keywords: *Kosovo, notary system, digitalization, the rule of law, human rights.*

The positive effects of high emigration in increasing the employment of women and marginalized minorities in Kosovo

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Abstract

Kosovo, especially in the last decade, has a high rate of irregular and regular emigration. European Union countries, especially Germany, have facilitated the procedures for obtaining work visas for Kosovars, and a large number of them emigrated to this European country in the last five years, while at the end of 2014 and the first quarter of 2015 the highest number of Kosovar asylum seekers was registered in European countries, especially in this country, as irregular migrants. In recent years, a significant number of Kosovars also emigrated to Slovenia and Croatia, with work visas, mainly in the construction, gastronomy and transport sectors. This increase in emigration with work visas of Kosovars continues at a rapid pace. Until now, this social and demographic phenomenon has been interpreted mainly only as a negative consequence, with the decrease of the labor force in the country, the decrease of the purchasing power, the breakdown of some requirements in the labor market, etc., but not for positive effects. The purpose of the research is to find the positive effects of the emigration of Kosovars, mainly men, in the increase of employment in Kosovo, especially of girls and women and members of marginalized communities such as the Roma. Through the statistical analysis of the use of secondary data from the Kosovo Statistics Agency, the Employment Agency of the Republic of Kosovo for the number of employed women and minorities in the last five years and the qualitative method of interviewing 30 entrepreneurs, the positive effect of emigration is confirmed high in mitigating unemployment among women and minorities in Kosovo. This study will have theoretical and practical implications, since for the first time, high emigration is also studied for its positive effects, and not only mainly negative effects.

Key words: *emigration, employment, minority, positive effect*

Plants and religion - Religious motivations in naming of plant in Albania

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Abstract

Ethnobiologists have emphasized the importance of plant local names as repositories of traditional knowledge to understand how communities recognize and use plants known to them, while linguists and anthropologists have illustrated them with examples of the semantic motivation of plant names in the language of these communities. The paper aims to analyse the naming patterns of some Albanian plants as a reflection of the religious world in the language image of the world. The analysis of the names of plants within this special field that expresses the specific national worldview shows how notions related to religion can serve as a tool for fixing information about the various properties of plants in the Albanian culture. Analysing some components of the culture and traditional knowledge used in relation to plant naming, perceptions and categorization of the religious world in plant names were investigated. In order to categorize their meaning in the relevant lexical field, a vast corpus of plants with religious attributes in their names were selected. The plant names were consulted from several thematic and explanatory dictionaries and analysed according to the categories of the Deity, the Virgin Mary, and Devil, the Saints, the Holy Days and the clergy in Albanian language. Based on the concept that the image of the world is a picture of everything that exists as an integral and multifaceted world structured and in the connections of its parts, reflected in the language with linguistic names that come from centuries of experience, the names of plants give us a view into community's way of life. Religion has always been an important part of people identity within a certain culture and it is expressed or mirrored in the names of plants due to similarities or usage.

Key words: *ethnobotany, plant names, language, religious contents, semantic motivations*

Women's participation in politics major challenge for gender equality in Albania after the 1990s. Case study Kruja

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Abstract

The purpose of this paper is to point out the importance of the participation of Albanian women in the political sphere. The paper focuses specifically on the role that women play in political life and how involved they are in this sector. Politics is an entirely masculine field, where political positions are held by men, even for the most part, only they run for such positions. The mentality and opinion do not tend to attribute their success to their abilities but always seek to find what they think is hidden behind this success. It seems that women who are capable of coming to the surface and surviving the social tsunami, are always seen with a kind of sceptical eye, which fails to accept that women are as capable as men. When girls and women get out of their traditional position they are the centre of attention to be attacked by others.

For the realization of this work, conducted a survey aimed to gather the causes, reasons, mentalities, and opinions of women and men in Kruja issue of women's participation in political life is a major challenge for gender equality in Albania. The survey included 300 individuals aged 18 and over. The sample was selected based on equal gender distribution, with 150 female respondents and 150 males. For the selection of the sample included in the study, the main criterion used was that the respondents must be over 18 years old and that the distribution in both genders is equal (150 females and 150 males).

Although formally the respondents on the one hand, as individuals, generally express positive and liberal opinions regarding gender equality and women's extensive participation in politics, the reality shows very fanatical and suffocating actions for women.

From the study data, it can be observed that men, more than women, think of the political sphere as a male and not a female activity.

Keywords: *Politics, Challenge, Gender Equality, Albania, Kruja*

Economic Relations between Kosovo and the Republic of Ragusa During the Middle Ages

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Abstract

This study briefly provides information about interesting data from the history of medieval economics. Hence, the complex relationship of the field of import and export of the economy in the Middle Ages between the Arbers and the Ragusans are discussed. The main goal is to achieve the most accurate results in the historical context and by analyzing these variations with different figures. While compiling this work, we have relied on various Kosovar, foreign authors as well as the relevant literature and archival sources that have given us an objective overview. These trade relations relied primarily on the needs of mutual exchange, while flowing from the need and desire for great profits. Thus, the desire to appropriate large assets was also the main driving force for trade links between Ragusa and Kosovo. These trade relations were based mainly on private enterprises, especially on the enterprises of traders, who belonged to the Ragusa nobles or the Kosovar-citizen trade class. Even the daily trade contracts, the engagement of traders, frequent travels, the establishment of trade associations and other business actions related to economic-trade relations are based mainly on individual enterprises, citizens of Ragusa or Kosovo. It is interesting to note the fact that the citizens of Ragusa, and those of Kosovar cities, no matter what position they held, traded only in the capacity of private persons. The economic policy of the two countries in the context of economic development has a very good effect on the successful inclusion of the Kosovar workers in the Middle Ages. Kosovo as a country with natural prosperity retained its uniqueness, and thus it traded with different ores, agriculture, livestock and various economic forms becoming an important partner with the power of time in economic terms - the Republic of Ragusa. The author has carefully used the synthesizing, descriptive, and comparative method in analyzing this issue. The study represents an important scientific contribution as it has not been specifically addressed in papers or monographs by various Albanian and foreign authors.

Keywords: *Economy, trade, Kosovars, Ragusans*

Memory and the *loslassen* concept in Kosovo

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Abstract

This paper aims to explore the concepts of memory and *loslassen* in the Kosovar context, almost a quarter of a century after the end of the war. It was the ongoing war that awakened this interest. The aim of this reflection is to examine whether there is an entrapment in the past fuelled by the memory of events or whether it has already been overcome through ‘*loslassen*’ and the ‘difficult forgiveness’ in Ricoeur’s terms. The importance of this step is crucial to be able to break out of the vicious circle of the ‘past becoming future’. On a practical and methodological level, however, the intention is to form a working group and through various qualitative-quantitative techniques – surveys, in-depth interviews, focus groups, interviews with privileged witnesses, case studies – obtain data. The target population will consist of university students, young people from the three villages or towns most affected by the war, those where the war was least felt, elderly people from these contexts, and leaders of organisations still present in Kosovo. Data analysis will be supported by software such as SPSS, SAS, MAXQDA. The final objective is to publish (both in Albanian and in English) in the form of an article or articles the results of the research, with the aim of identifying difficulties and critical issues in order to then be able to intervene at the level of educational policies with appropriate programmes.

Key words: *memory, loslassen, Kosovo, generations, past-future.*

Navigating Copyright Infringement in Virtual Reality: Challenges and Solutions for Protecting Original Works

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Abstract

The rise of virtual reality technology has created new opportunities for creators to produce and distribute works, but it has also raised several legal challenges. Some major issues are the questions of how current copyright laws apply to virtual reality content, and what is the impact of virtual reality on the traditional concept of “authorship”. This research paper will explore the issue of copyright infringement in virtual world, and provide a comprehensive understanding of the legal landscape surrounding IP, and potential challenges that creators may face in enforcing their rights in virtual reality.

Key words: *Authorship, Challenges, Copyright infringement, Enforcement of IPRs, Virtual reality*

9. Philological Sciences and Arts

The impact of the physical classroom environment during the learning process at James Madison University undergraduate students

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Abstract

The purpose of this survey will be to identify the environmental aspects at James Madison University (JMU), undergraduate classroom setting, to analyze the degree of concentration, aesthetic satisfaction, and retention of academic learning material. At this stage in the research; the type of lighting, usage of color, quality of desk and seating instruments, and, the noise level in the surrounding environment, will be qualified as the sensory aspects of the immediate learning environment. However, there is still a need to demonstrate how the physical classroom environment affects the learning and teaching process at JMU. This survey will be exclusive to James Madison University students and staff when distinguishing the methods used in the physical environment and interpersonal skills of the professor to encourage engagement within the classroom.

The *experimental learning theory* will be applied in an effort to ascertain if the sensory components of the physical environment enhance student learning outcomes and personal happiness. According to Kolb's (1984) theory of experiential learning, learning is the process of acquiring information via experiences. Additionally, this survey attempts to assess professor and student understanding in relation to the overall outcomes of the learning process. About 500 undergraduate students at JMU will be asked to complete a survey that consists of 30 questions on the subject of how the classroom environment affects learning. The main inquiry will be whether or whether the style of the classroom learning environment affects how students learn. Modern physical learning environments will be adaptable in terms of size, form, and furniture arrangement.

Keywords: *classroom environment, James Madison University, affect, learning process*

A Kantian Reading of Bernard Malamud's Novel *A New Life*

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Abstract

This article seeks to analyze the novel "A New Life" by Jewish-American writer Bernard Malamud (1914-1986) from the perspective of Kant's deontological ethics. In order to escape a bleak past of heavy drinking and loneliness, Seymour Levin conscientiously leaves New York to build a new life as a teacher in a small university in the West. But he gets entangled in a venomous administrative intrigue and is passionately involved with the superior's wife. This causes a scandal in the college and the hero, following numerous complexities that permit the reader to measure the mediocrity and hypocrisy of the milieu, decides to return with her to the East in the end. Based on a qualitative methodology of research, the study begins with an introduction into Kant's duty-based ethics by putting forward the interrelated concepts of good will, duty, and the three formulations of the categorical imperative that constitute the basis of Kant's moral philosophy. It is concluded that the transformation of the novel's protagonist, from a former alcoholic to a morally responsible and committed human being, occurs in line with Kant's deontological ethics, whereby Levin manages to not only change for the better on an emotional and moral level, but also actively promote high academic and liberal values at his stagnant work environment.

Key words: *Deontological ethics, duty, categorical imperative.*

The effect of extensive use of anglicisms in the language of the Law on Higher Education in Kosovo

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Abstract

Virtually, all the European languages have influenced each other in a way and some of them spread also all over the globe. English, being one of the most widely used language, is spoken by a large mass of one and a half billion people in the world. Although with many "foreign" words, English is supposed to be one of the most influential languages worldwide – and at this point, Albanian language is not an exception. As we already know, an Anglicism is an English word that is used in other languages, other than English. Moreover, the Law on Higher Education in the Republic of Kosovo is one of the binding legal documents we analyzed with regards to the use of anglicisms. Our main goal is to present a contrastive analysis among the use of anglicisms in the Law on Higher Education of the Republic of Kosovo in comparison to the Law on Higher Education that was promulgated in 1974. The overall number of anglicisms used in this Law - being the actual law into force in Kosovo - and its classification according to the word classes will also be presented in this study along with the contrastive analysis with the language of the law used in the Law on Higher Education which entered into force in 1974. While contrasting this corpora, our attempt will mainly focus on the words used in the Albanian language in the first Law of 1974, but were later replaced with anglicisms in the actual applicable law.

Key words: *Anglicism, contrastive, classification, law, higher education.*

Embracing technology in translating legal discourse in public and private institutions in Kosova

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Abstract

This research is solely devoted to the study of the diversity associated with the importance of embracing recent translation tools in Kosova. Latest developments of translation technology have definitely facilitated the life of a translator in the last decade in our country. If we compare the translator's role in the last ten years, we will notice considerable inconsistency in terms of developments of translation technology. Hence, there is an incredibly discrepancy on the way the translators are using CAT (Computer-Assisted Translation) tools by local institutions, more particularly justice institutions, in comparison to others working in private companies or as freelancers. Though, recent technological translation software is being used extensively by private companies and freelancers in our country, on the other hand, local institutions such as courts, prosecution and ministries are very rarely or hardly ever using them on their work. It is worth mentioning that the paradigm shift currently taking place in the translation industry is driving translators to adapt to latest applications such as Translation Memory tools and Quality Management tools to ensure faster, more accurate, and more stable translation, able to compete with larger organizations that provide machine translation such as Google and Microsoft. Additionally, the contrastive analysis of data shows the diversity of techniques used in rendering translation of legal discourse.

Key words: *CAT tools, legal, technology, translation, texts.*

Art, Murals, and Student Engagement in the Transformation of Educational Environments

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As art has proven to be an effective way of bringing people together, there has been a tendency to fuel student engagement by displaying different art forms in educational environments. Similar initiative has been witnessed near the University of Applied Sciences in Ferizaj, where its very own students have artistically transformed its facilities. The process of painting collective murals in the above-mentioned institution has fueled student teamwork and empowered them toward a common goal. On the other hand, the final results of the latter now serve as a platform to showcase and solidify the institution's values and attributes.

Using a survey as part of the research process, we will utilize gathered data from more than 200 surveyed students to reveal how this creative endeavor has manifested in their daily educational activities. Furthermore, throughout the study, we will navigate through the student-to-student and student-to-institution relationships built upon the artistic initiative of the University of Applied Sciences in Ferizaj

Key words: *art, murals, student engagement, university*

Comparison of word formation processes in various translations

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Abstract

As we know, language is the most important means of human communication. Language is a living organism, it grows and develops, and sometimes it even dies. According to De Saussure, different languages can be compared to each other, and this paper is an attempt at doing just that.

Word formation plays a crucial role in the development of any language. This is true for the German, Albanian and English language, which we will be comparing in this paper. Throughout this process, which at times proved to be tiresome, considering that there are fewer studies done in Albanian as compared to German and English, we have compared and analyzed the word formation process in German, Albanian and English to demonstrate the importance of word formation for the culture and language of the different peoples whose languages we have compared.

The source of the analysis and results of this paper are the works of two important authors. We will be comparing Stefan Zweig's "*Brief einer Unbekannten*" and both versions of its translation in Albanian, that of Robert Schwarz, and Nikolla Prie, as well as the English version "*Letter from an Unknown Woman*", translated by Anthea Bell. The second novel we will be drawing comparisons from is Ismail Kadare's "*Gjenerali i ushtrisë së vdekur*", the original, Albanian version, its translation in German by Joachim Röhm, and the English version by Derek Coltman. During our research, we have mainly focused on the use or substitution of words in the translation process, which occurred due to a lack of adequate, equivalent words in one or the other language, as well as their similarities and differences when they appear in these works.

That being said, this paper does not only include a scientific and linguistic perspective, but also one that is creative, by insisting that more such comparative studies of translations are done in the future, especially those of authors who have coined new words, as Kadare has, in order to recognize the function of these neologisms in our language and their translation and function in foreign languages.

Key words: word formation, translation, language.

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