

**ABSTRACTS MECHANICAL AND ELECTRICAL ENGINEERING**

**THE ASPECTS ON THE ELECTROCONDUCTOR FLUID MOTION IN THE TOROIDAL MERCURY INDIUT GYRO-MOTOR**

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**Abstract:** *In this paper the authors have tried to do their modest part to the study of the electro-kinetic and magneto-hydrodynamic phenomena occurring in the operation of the liquid armature gyro-motor both the theoretical and experimental points of view.*

*From the studies done by the authors it results that this mercury induit rotates in concentric layers at different speeds representing a very interesting and unknown phenomenon till now.*

*In the liquid armature electric machines, in this case, the mercury induit gyro-motor, an interaction between the magnetic field and an electro-conductor liquid (mercury) traveled by a current takes place. As a result of this interaction, the electric energy is converted into a mechanical energy of the fluid, mercury, which is the carrier of angular momentum, too.*

*Theoretically, it has been proved that this motion is special under the electromagnetic field conditions differing from the fluid motion in the pipes in the absence of electromagnetic field; this characteristic of motion was confirmed by the experimental results.*

*The tangential speed of the electro conductor fluid in the mercury duct is influenced by the variation of pole pitch with channel radius due to the constructional form of the toroidal stator.*

*Experimentally, it has been found that the mercury moves in layers, their thickness depends on the relation between the intermolecular attraction forces and Lorenz forces which put in motion the electro conductor fluid.*

**Keywords:** *fluid motion, gyro-motor, toroidal mercury induit*

**DYNAMIC MODELING OF THE FLOW OF AN UNDERWATER REMOTELY OPERATED VEHICLE (ROV) USED AGAINST MARITIME MINEFIELDS**

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**Abstract:** *Maritime mine countermeasures represents, as a whole, one of the most important and sensitive actions, in either naval warfare or asymmetric warfare. Due to their relatively simple construction, maritime mines can be effective means within the terrorists' arsenal in order to block the maritime communications. Taking in account the underwater remotely operated vehicles' capabilities (ROV) they are increasingly used for maritime areas surveys as well as for mine clearance. The present paper describes the results of a ROV's motion modeling gathered by the authors while working out a research and development project carried out in the „Mircea cel Bătrân” Naval Academy of Constanta, Romania. Following the quantitative expressions of the differential equations of motion through the water, the authors successfully modeled the ROV dynamics based on Fluent software.*

**Keywords:** *ROV, modeling, motion, equations*

**SENSORLESS CONTROL OF PERMANENT MAGNET SYNCHRONOUS MOTOR (PMSM) BY THE AID OF A REFERENCE ADAPTIVE SYSTEM**

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**Abstract:** *Speed and torque controls of permanent magnet synchronous motors are usually attained by the application of position and speed sensors. However, speed and position sensors require the additional mounting space, reduce the reliability in harsh environments and increase the cost of a motor. Therefore, many studies have been performed for the elimination of speed and position sensors. This work investigates a novel speed sensorless control of a permanent magnet synchronous motor. The proposed control strategy is based on a Reference Adaptive System (RAS) using the state observer model with the current error feedback and the magnet flux model. The proposed algorithm has been verified through the simulation and experiment.*

**Keywords:** *PMSM, Reference Adoptive System*

**COMPUTATIONS OF SOME TRIGONOMETRIC SUMS USING MATRIX CALCULUS**

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**Abstract.** *In mathematical models of some phenomena and optimization problems, we arrive to some sums of the form*

*$$\sum_{k=1}^n a^k \sin kx \text{ or } \sum_{k=1}^n a^k \cos kx .$$
 In this paper, we will expose a method to compute this kind of sums using matrix calculus.*

**Keywords:** *matrix, trigonometric function*

## **A GENERALIZATION OF LEIBNIZ – NEWTON FORMULA**

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**Abstract.** *The importance of definite integral in practice, in general, and for mathematics, particularly, it is well-known, therefore his calculus was a base problem of mathematics. In this paper we will make a generalization of calculus of the definite integral.*

**Keywords:** *Integral, Leibniz – Newton*

## **ELECTRIC DRIVES WITH FIELD ORIENTATED CONTROL FOR NAVAL MECHANISMS**

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**Abstract:** *In this paper, the authors propose the embracing of a solution regarding the implementation of the direct vectorial control in torque and flux on the induction motor with squirrel cage rotor for the electrical drive systems of the naval mechanisms. Through this is desired the replacement of the actual technical solution, at which for the drive of the loading equipments are used asynchronous motors with squirrel cage rotor with three speed steps obtained with the help of three separate statoric windings in star connection. The main disadvantages of the actual solution are: large size, complicated construction of the driving machine, the modification of the speed can be made only in steps. In order to eliminate these disadvantages a technical solution is proposed which keeps the induction machine as the executive element, but at which the control of the movement, that assumes the control of the speed and/or the control of the position respectively the control of the torque is made through direct vectorial control in torque and flux. The main advantages that are obtained are: - a fast answer in torque and functioning in a wide range of speed, a robust control and relatively simple to implement, does not need current regulators and coordinate transformers, does not need a decoupling circuit of the statoric voltage equation and neither a separate vectorial modulator for the command of the PWM inverter, an efficient rejection of the disturbances is assured and it folds well on the numerical control, a normal asynchronous motor with squirrel cage rotor can be used, with only one winding on the stator, the modification of the speed being made through vectorial control, the command panel is eliminated, on which the direction, acceleration, breaking contacts and time relays can be found.*

**Keywords:** *Naval mechanisms, electrical drives, induction machine, ABB inverter, acquisition boards, vectorial control, lifting equipment*

## **EXPERIMENTAL RESEARCHES OVER THE POSSIBILITY OF SEA WATER PROPULSION BY INDUCED CURRENTS**

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**Abstract:** *The induction naval MHD thruster is in fact a linear electric engine in which the metallic moving drive has been replaced with a pipe filled with sea water. The current induced in water interacts with the progressive magnetic field of the inductor. So that is generated forces that make the water to move through a pipe. The sea water has conductivity  $10^7$  times smaller than copper and because of this reason the quality factor of the sea water engine is very small. The experiments made with classical linear engines having as a moving drive the sea water and are supplied with a three-phased current with industrial frequency (50Hz) do not succeed to make water to move. The theoretical studies showed that increasing the polar step and the frequency may increase the value of the quality factor until values that make the sea water to move. In his paper, the author shows an experiment that demonstrates the possibility of moving sea water using an induction spinning micro engine supplied with two-phased current of 15 KHz. It is described the construction of the micro -engine and that of the supplying system and the experimental results are interpreted.*

**Keywords:** *sea water propulsion; induced currents*

## **AN EXPERIMENTAL METHOD AND DEVICE DEMONSTRATING QUANTIFIED ABSORPTION OF ENERGY BY ATOMS**

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**Abstract:** *In the paper the authors present a method and an experimental device for didactic purposes which allows the demonstration of quantified absorption of energy by mercury and oxygen atoms through Franck-Hertz method.*

**Keywords:** *energy, atoms, absorption*

## THEORETICAL RESEARCHES OVER THE QUALITY FACTOR OF AN INDUCTION MHD THRUSTER

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**Abstract:** Naval induction magneto hydrodynamic (MHD) thruster is an induction linear engine having as a moving drive the sea water. The efficiency of an induction engine can be characterized by its quality factor defined by E. Laithwaite as the ration between the magnetization reactance and the moving drive's resistance.

In his paper, the author gives a different definition to this factor and demonstrates the equivalence between his definition and that of E. Laithwaite.

The author find out the mathematical expression for this factor in the case of a liquid moving drive whose speed is not constant on a perpendicular direction to the pipe.

In conclusion, the author compares the quality factor of an engine with sea water moving drive with that of an engine with a metallic moving dive and demonstrates the fact that the MHD thruster is feasible if the polar step and the frequency have increased sizes.

**Keywords:** induction, MHD THRUSTER, research

## SOLVING A GAUSS – KUZMIN THEOREM FOR RCF USING RSCC

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**Abstract:** The paper present a solution for a Gauss – Kuzmin theorem associated to the regular continued fractions using the ergodic behavior a homogeneous random system with complete connections associated with this expansion.

**Key words:** continued fractions, random system with complete connections , Gauss – Kuzmin

## SOUND ABSORBING MATERIALS

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**Abstract:** Nowadays, sound absorbing materials are used on a large scale and in different industries as well as for people's comfort in homes and other public areas. Lot of research is about improving the absorptive and reflective characteristics of the materials.

**Keywords:** sound, absorbing materials, ship

## ALGEBRAIC DOMAIN DECOMPOSITION METHODS

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**Abstract:** By using the domain decomposition methodology, we construct several algebraic domain decomposition methods for certain algebraic systems with sparse matrix. These methods are highly parallelizable. We show that these methods are convergent and we also discuss the eigenvalue distributions of the corresponding iterative matrices in order to analyze the convergence factors of these methods.

**Keywords:** algebraic systems, decomposition

## THE INFLUENCE OF THE SHALLOW WATERS TO SHIP'S HULL VERTICAL VIBRATION

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**Abstract:** Hydrodynamic influence on ship's hull vibration in water is expressed in terms of added mass, which depends on flow domain, such as water depth, flow-field boundaries, ship's underwater shape and vibration modes. The problem of the added mass of a continuous ship-hull girder vibrating vertically in deep water and close to water bottom is studied. The added masses for vertical vibrations of the ship's hull are computed with the Schwarz-Christoffel method for shallow waters beneath the keel. The results obtained show differences between this method and the Lewis one, and also the added mass influence on the natural frequencies of a bulk carrier seen as a continuous girder. In order to determine the dynamic response of the ship's hull from the pulsatory pressures on the aft counter we utilized the dynamic transfer matrices method corresponding to the forced vibrations. Multiple personal computation programs has been realized for the computation of the necessary data (added mass through both methods, frequencies and vibration modes, responses to the forced vibrations, etc.). Numerical values show that the effects of shallow water are significant and quite important in ship's hull vibrations.

**Key words:** shallow water, ship vibration, added mass, transmission dynamic matrices method

## **THE ELECTRIC CHARGE ACCUMULATION TO OIL TANKERS**

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**Abstract:** *The paper makes an analysis from an electrostatic field point of view of installations onboard oil carriers leading to the production and storage of electrical charges. We take a close look at the loading gear of specialized ships carrying oil products starting with steam operated pumps and ending with metallic pipes and filters. When cleansing oil tanks with oil, water, and then steam, washing plants are another source of electrical charges. The inert gas plant may generate an electrical charge of more than  $0,6 \mu\text{C}/\text{m}^3$  due to the fact that the inert gas has a complex composition and it goes through the exhaustion nozzle in its way to the oil storage compartment. The drain arrangement collecting the water, oil and flammable products residues through piston pumps, pipes and collecting tanks constitute another source of electrical charges. Taking all these installations into account we have attempted to make an evaluation of the electrostatic energy stored within oil products onboard a specialized ship.*

**Keywords:** *electrostatic field; bilge; heating device; washing installation; steam pumps*

## **SPECIFIC NAVAL EQUIPMENT**

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**Abstract:** *Control engineering embraces instrumentation, alarm systems, control of machinery and plant previously known under the misnomer of automation.*

*Control engineering can be applied not only to propelling and auxiliary machinery but also to electrical installations, refrigeration, cargo handling (especially in tankers) and deck machinery, e.g. Windlass control. Opinion still vary on such matters as the relative merits of pneumatic versus electronic system and whether the control center should be in the engine room or adjacent to the navigating bridge. Arguments against the exclusion of the engineer officer from close contact with the machinery are countered by the fact that electronic systems are based on changes other than those of human response. Automated ships (UMS) operate closer to prescribed standards and therefore operate with greater efficiency. The balance between the possible and the necessary would be achieved in this case by combining automatic monitoring of all the likely fault conditions, with routine machinery space inspection say twice a day [1...9].*

**Keywords:** *naval equipment, automation, machinery, system*

## **THE SIMULATION OF THE EFFECTS OF THE RADIANT ELECTROMAGNETIC PERTURBATIONS UPON A DIGITAL ELECTRONIC CIRCUIT REALISED WITH A TYPE RISK MICROCONTROLLER**

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**Abstract:** *The study analyses the effects of some external radiating electromagnetic perturbations upon an electronic device with type RISK microcontroller, based on a simulation technique of induced perturbations by using some fictive perturbation sources on the mass circuits. For this reason there are presented comparative graphics of unperturbed useful signal and perturbed one, using sinusoidal signals, the latest having comparative amplitude with the useful signal and different frequencies, going through 3MHz (radar frequency zone). The designing of the electronic device with microcontroller, as well the performance of the simulation technique, has been made with TINA standard program.*

**Keywords:** *electromagnetic perturbations, digital electronic circuit, rish microcontroller*

## **ABSTRACTS OF SOCIOUMANITAS AND ECONOMICS SINCE VALUE-ADDED SERVICES OF LOGISTICS CENTERS IN PORT AREAS**

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**Abstract:** *Generally, the function of a port as a node in the transport chain depends on its location and on the economic and technical developments that exist in its hinterland. Modern production techniques and consumption patterns increase the use of transportation systems beyond levels suggested purely by the growth in trade and commerce. As a result, more specialized handling, storage and other logistics facilities are needed. This process of specialization and adjusting to customer's demands, which has taken place over the last two decades in most Western countries, is now taking place with even greater speed in the emerging economies.*

*More and more, the ports are becoming an important part of the so-called integrated logistics chains. In order to stay on the market, the ports have to diversify their activities and services. Instead of offering traditional services, they have to focus more on implementing new value-adding logistics services. Port's managers need to work together with local authorities, law makers, manufacturers, investors in order to create a favorable environment to put all this in practice. Value-added logistics services in port areas will play a key role in the future in bringing more revenue to specific hinterlands.*

**Key words:** *value-added service, cargo, port, ship, logistic center*

### **WHAT ABOUT HOTEL CALIFORNIA?**

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**Abstract:** *Considering the ever-changing preferences of worldwide tourists we have deemed proper to shed some light upon the roots of the word hotel as it prevails in the English language in particular and the cross-cultural context of nowadays society. In the paper you shall find some interesting approaches in terms of usage and connotations of the word hotel as well as a list of newly-formed words in the field of hotel management and administration. Last but not least we have included some hints at a renowned hit namely Hotel California of the American hit The Eagles all in the hope of focusing on this “Ba’hai” word in today’s globalize planet.*

**Keywords:** *hotel, etymology, connotation, denotation.*

### **CARDIORESPIRATORY FITNESS ASSESSMENT**

**Aurel BEJAN<sup>1</sup>**

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**Abstract:** *The purpose of this study was to identify and explain some commonly used methods to asses' cardio respiratory fitness. Additionally, the assessment must have minimal equipment and be moderately accurate. It was also shown that the field tests to asses CR fitness are based on scientific data that addresses such areas as relative and absolute measures of  $O_2$ , ventilatory break point, or onset of blood lactic acid, and work rates. And finally, the various methods in the Naval Academy uses to assess CR fitness were presented.*

**Key words:** *cardio respiratory fitness, methods of assessing the level of CR, work rate,  $VO_2$*

### **THE CONSCRIPTION IN FRANCE**

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**Abstract:** *Although it is already known that France discarded conscription almost 8 years ago, this paper attempts to investigate the reasons for the end of conscription in the above-mentioned country, after a brief presentation of the French military and its organisation, a history of the word itself, and last but not least, the arguments for and against this ancient institution strictly linked to the republican values.*

**Keywords:** *conscription, France, draftees, military, JAPD*

### **KEY PERFORMANCE INDICATORS USED IN TRANSPORT MODE BENCHMARKING**

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**Abstract:** *Transportation modes are an essential component of transport systems since they are the means by which mobility is supported. Basically, transport modes are the means by which people and freight achieve mobility. They fall into one of three basic types, depending on over what surface they travel – land (road, rail and pipelines), water (shipping), and air. Each mode is characterized by a set of technical, operational and commercial characteristics. Each mode has its own requirements and features, and is adapted to serve the specific demands of freight and passenger traffic. This gives rise to marked differences in the ways the modes are deployed and utilized in different parts of the world.*

**Keywords:** *benchmarking, USA, industry, economic environment, KPI*

## **ECONOMIC ACRONYMS**

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**Abstract:** *Abbreviations are known as a shortened form of a written word or phrase used in place of the whole. They come in many forms and are extensively used in all fields of activity, and the economic language is no exception. It abounds in all sorts of short forms that make communication one hand easier for those who are familiar with it, and on the other hand quite frustrating for outsiders of the field. Economic acronyms cover all sorts of economic realities, from ordinary concepts (IR – interest rate), to currencies, to economic events in the life of a company (AGM – Annual general meeting), to complex terms (CES – constant elasticity of substitution, a property of production) and intricate economic models (IS-LM).*

**Keywords:** *abbreviations, interest rate, annual general meeting, constant elasticity of substitutions, initialism*

## **NEGOTIATION AND PROCESS SYLLABUS IN PRACTICE**

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**Abstract:** *The present paper is based on the assumption that collaborative classroom negotiation could be introduced into an ESP teaching situation where previously design and implementation decisions had been made prior to the start of the course. A process syllabus evolves directly from the immediate context of the course in which it is developed, deciding who does what as defined by whom. Any coherent language curriculum will attempt to reconcile what is desirable [policy] with what is acceptable and possible [pragmatics]. This paper will attempt to demonstrate how classroom decision-making could provide a pivotal role in facilitating this reconciliation by means of negotiating learning content.*

**Keywords:** *syllabus, collaborative learning, learner centeredness, autonomy*

## **METHODS IN THE ROMANIAN NAVAL PENTATHLON PERFORMANCE FOR UTILITY SWIMMING**

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**Abstract:** *In this paper we try to present a model of training for the naval pentathlon. Utility swimming race it's the most important event in the naval pentathlon. The increase results for this event it's very important in ergonomic the total points to the naval pentathlon.*

**Keywords:** *Lifesaving race, seamanship race, utility swimming race, amphibious cross-country race.*

## **GLOBALIZATION AND EDUCATION...THEN AND NOW**

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**Abstract:** *Globalization has been one of the most debated topics in the world over the past few years. The process started approximately 1000 years ago. Rapid growth and poverty reduction in China, India, and other countries that were poor 20 years ago, has been one of the positive aspects of globalization. But globalization has also generated significant international opposition over concerns that it has increased inequality and environmental degradation.*

*The paper presents a short history of globalization, its challenges and its effect on students and of course on the educational system. The paper discusses also the fact that quite often, globalization is seen as an exclusively Western phenomenon, which is understood, in most of the cases, as an aggressive force that often endangers indigenous cultures and ways of life.*

**Keywords:** *globalization, education, skills, youth, phenomenon*

## **OLD VS MODERN METHODS OF TEACHING ENGLISH**

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**Abstract:** *The article focuses on different methods of teaching English and presents a parallelism between old teaching methods and new methods in teaching English. Teaching “traditional grammar” is one of the emphasized aspects. We also refer to the new teaching methods and their advantages and disadvantages for some of the learners and how well memorizing is entwined with what the new methods involve: learning and teaching using games, employing one language only (English) in the teaching process, or learners guessing the topic and the new grammar rule they are to study.*

**Keywords:** *teaching methods, traditional, perspective, approach, knowledge.*

## **PERSON - RELATED AMERICAN SLANG**

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**Abstract:** *Slang is the use of informal words and expressions to describe an object or condition. The definition of slang varies widely; however the generally accepted definition is of language which is very informal or much below the standard level of education - colloquially known as “street talk”.*

**Keywords:** *slang, culture, language, education*

## **THE EVOLUTION OF NAVY EDUCATION DURING THE INTER-WAR PERIOD**

**Vasile NAZARE<sup>1</sup>**

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**Abstract:** *Given the opportunity of the 136 years celebration of Romanian Navy Education, we would like to go back in time to depict the context, the necessity and the contribution of the ones involved – the state’s institutions: the king, the parliament, the army and so on – in this commune effort regarding the progress of civilization and the country cultural development.*

**Keywords:** *navy, education, inter-war period*

## **THE ACTUALITY OF GUSTI'S ANALYSIS REGARDING DICTATORSHIP**

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**Abstract:** *Familiar with the interbelic Germany’s political life, the famous professor was preoccupied with finding explanations and arguments, both of scientific and common sense nature, regarding the unfortunate ascension of Nazism and its leader in the history of Europe and humanity. In a certain way, the explanation for the appearance of this phenomenon or of the totalitarian leaders (dictators) resides even today in the contemporaneous political theory. It becomes the starting point in analyzing political speeches which have persuasive and manipulatory valences, and also in the depiction of a taxonomy for political leaders.*

**Keywords:** *dictatorship, Gusti, culture, leader*

## **SOME ELEMENTS CONCERNING THE ASSESSMENT OF THE TRAINING AND THE CAPABILITIES TO PERFORMANCE BY PHYSIOLOGICAL TESTING OF SWIMMERS**

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**Abstract:** *This paper is presenting some assessment of the specific training level by physiological tests on swimmers. The work is inspired by testing protocols outlined by Australian Swimming Inc. Many of the protocols have already been described in specialized works in order to suggest various fitness compounds for highly trained swimmers. In the same time, even if some national level swimmers would be asked to stand some special tests it doesn’t mean that would stop the creativity and inspiration of coaches and scientists to use their own methods and testing systems. We are only presenting here general issues stressing on scientific methodology in order to help the practice action.*

**Keywords:** *swimming, physiological test, submaximal aerobic/anaerobic effort, assessment, training level, performance*

## **THE NEW ARCHITECTURE OF ECONOMIES’ TYPOLOGY INTO GLOBALIZATION CONTEXT**

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**Abstract:** *Over viewing the most recently evolutions throughout global economy, we can easily conceive that the collateral effects of economical globalization and market integration, represents the main issues debated in specialized professional or political circles. The first step toward regain the global markets functionality is to review as a sine-qua-non condition, the institutional and functional structure of financial system and global economy system as well. In such context, this paperwork is meant to propose a new architecture of economies’ typology, reflecting in fact the most recently particularities of markets’ function. The criteria took under consideration has been the relevancy related to commercial and financial flows. Even the parameters presented here are quite abstracts in lack of detailed statistical data are important to reflect the new causality tied between economies in the new context of globalization.*

**Keywords:** *globalization, global economy, economical integration, global factors*

## **FIRST DAY ICEBREAKERS – GETTING TO KNOW YOUR STUDENTS**

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**Abstract:** *Students often approach a new year and a new English teacher with some anxiety, some are not very talkative or relaxed at first, while others might even feel ill at ease when introducing and speaking about themselves. The purpose of this article is to present a set of helpful icebreakers which will put students at ease with the teacher and with each other. Icebreakers are short, helpful activities meant to make people more relaxed at the beginning of a course or fill those inevitable gaps during class. Icebreakers are the perfect first-day activities for an English class. Getting-to-know-you games and activities allow everyone in the class to get acquainted, help with team building and set a relaxed, fun tone to the first day.*

**Key words:** *icebreaker, method, interactive activities, speaking skills*

## **BRAINSTORMING ON THE PROCESS OF WRITING**

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**Abstract** *If you remember the most important rule of writing then you will improve as a writer. Developing your own individual creative process and giving it time to work will make you a better writer. This is the case with most jobs -- whether you must write internal memos, correspond with clients, or help design sales materials. Writing beautiful prose and poetry is a talent. Writing effectively, however, is a skill that can be learned.*

**Keywords:** *writing, organization, grammatical devices, vocabulary, patterns.*