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КАФЕДРИ ІНОЗЕМНИХ МОВ**

**«TO MAKE THE WORLD SMARTER AND SAFER»**

(Суми, 28 березня 2019 року)

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
SUMY STATE UNIVERSITY  
FOREIGN LANGUAGES DEPARTMENT  
LANGUAGE CENTRE

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**“TO MAKE THE WORLD SMARTER AND SAFER”**

(Sumy, March 28, 2019)

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# SECTION 1 INFORMATION AND ENGINEERING TECHNOLOGIES

## PROBLEMS ASSESSMENT OF RELIABILITY ELECTRICAL EQUIPMENT IN CONDITIONS OF MODERN TECHNICAL REGULATION

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The calculation of reliability indicators of products is carried out at the stages of research, technical proposals and research and development (in the development of sketch, technical projects, operational design documentation) in a limited scope of testing with the involvement of a priori information on the reliability of the design elements of products and test results on reliability, durability and consistency of structural and technological analogues.

At present, the national standard ДСТУ 2992-95 applies to non-renewable electronic products: integrated circuits, semiconductor devices (transistors bipolar and unipolar, diodes of different types), resistors, capacitors and establishes methods for calculating reliability.

When calculating the reliability of integrated circuits it is assumed that the failure of any element causes the failure of the integrated chip as a whole. While calculating we take into account the reliability of such components and elements of chips as the case, the connection of the crystal with the body of the body, the wire connection, between the elemental connection, the elements of the crystal, other components and elements.

In accordance with the requirements of DSTU 2992-95, the intensity of the bounce chips is calculated by the formula:

$$\lambda = K_n (\lambda_1 + \lambda_2),$$

where  $\lambda_{OK}$ ,  $\lambda_1$ ,  $\lambda_2$  - respectively: the intensity of bounce chips, 1 / hour; the intensity of failure of structural elements (housing, welded joints, etc.), 1 / hour; the intensity of the failure of the elements of the circuit (elements of the crystal and micelles, etc.), 1 / hour;  $K_n$  -

coefficient the acceptance type of, which characterizes the system of retesting tests and corrects reference data on reliability, taking into account the level of the production quality of the used elements (components). The correction is carried out in relation to the level for which reference data are given on the intensity of the failure of the element.

The decree of the Cabinet of Ministers No. 95 "On Approval of conformity assessment modules used to develop conformity assessment procedures and rules for the use of conformity modules", was adopted in 2016 in Ukraine and is adopted which is adapted to the EU Directives The groups of semiconductor devices (NP), which are presented in drawing 1. depend on the quality of production, the working capacity of the technological system from defective tests and the presence of electro-metering (ETT)

**I group** - analogues of microcircuits and SC, the reliability of which is determined, should be serially made on the worked technology for at least three years and are subjected to a special rejection system and ETT;

**II group** – analogues of chips and SC, the reliability of which is determined, must be serially manufactured using the spent technology for at least three years and are subjected to ETT without a special rejection system;

**III group** – analogues of chips and SC, the reliability of which is determined, must be made on the worked technology not less than three years, and the special rejection system and ETT are absent;

**IV group** – analogues of chips and SC, the reliability of which is determined, must be serially manufactured for non-worked technology (less than three years) and are subjected to a special rejection system and ETT;

**V group** – analogues of chips and SC, the reliability of which is determined, must be serially manufactured for non-refined technology (less than three years) and are subjected to ETT without a special rejection system.

Figure 1 - ETT and SC groups according to ДСТУ 2992-95

The conformity assessment procedures are legally equivalent, but are not technically the same in terms of methods. Their application is aimed at ensuring a high degree of certainty in relation to product compliance with relevant essential requirements. There are eight modules (named from letters A to H). This method not only reduces the burden and costs, but also is more effective compared to the traditional expertise of product conformity directly with legal requirements. Once the type has been approved (and this is done only once for a specific sample), everything that needs to be checked is only the conformity of the products that will be put into circulation, approved by the standard ones.

Thus, at present, there is no connection between the classification of product groups, developed at the time of the establishment of the UkrSEPRO certification system (in Ukraine, abolished in 2018) and modern conformity assessment modules that are adapted to the EU directives. Consequently, at this time, there is a problem of adaptation of requirements of normative documents on the evaluation of the reliability of electrical products to the current conditions of technical regulation.

## **THE DEVELOPMENT OF AUTOMATION IN OUR TIME**

*Vladyslav Bondarenko, group SU.m-81,  
O.R. Gladchenko, EL Adviser*

Automation is the highest step in the complex control of technological process of production. In Ukraine automation opens up unlimited opportunities for increasing labor productivity even faster rates of production development, creating the wealth of products and further increasing of welfare of the population thus avoiding the direct use of physical labor of workers in difficult and harmful processes. Wide introduction of mechanization and automation of production processes on its basis, along with a solution of other problems, can reduce losses in production and facilitate the conditions for obtaining standard products.

Automation makes work more refined and creative. The development and implementation of modern methods of management is carried out by a large team of scientists, specialists and workers of sugar factories, as well as many organizations of machine-building and instrument-making industries. Thanks to their efforts in manufacturing, the most advanced automation tools and automated control systems are implemented, including automated control systems for technological processes. The main purpose of creating automatic control systems for technological processes with the use of modern computers includes realization of potential opportunities embodied in the technological process and equipment, as well as improvement of organization of management, achievement of optimal technical and economic indicators of production.

In the automated control system of many enterprises production management is carried out by a controller-technologist, whose functions include external and internal coordination of the production sites, monitoring the implementation of operational plans of production, identifying the causes of irresponsibility, taking measures to eliminate them, and so on. The purpose of automation of technological production is to increase the efficiency and productivity of labor, improve the quality of manufactured products, create the best conditions for optimal utilization of all available resources at the enterprise.

## **TO MAKE THE WORLD SMARTER AND SAFER**

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Water reactor, cyclotron, radioisotope, high-flux reactor, first fast speed computer, first robots - all these notions were made by people for development of society and its comfortable life. Scientists from China were among the first inventors who changed our life with the help of their contrivances. Last century made our society more computerized. New inventions can't be considered without concept "innovation". Innovation is the process of creating an idea or invention into a good or service in order to earn money.

There are some types of innovations: product innovation (creating new product), process innovation examples (quickly replying to market demands and having manufacturing process), technological innovation examples (innovations in renewable energy), etc. Google, Facebook, WhatsApp are examples of innovations in business. We can't imagine our life without such devices as smartphone, laptop, tablet, microwave oven, coffee maker, etc. All these devices make our life better every day. For example, buildings with touch floors, doors, refrigerators are available nowadays in European countries, USA and China.

Although new appliances make our life comfortable, we don't have to forget about their effect on our subconscious and mental state. Some people are computer addicts, and nowadays it is serious disease, especially for children. It also affects our health. Loud music leads to hearing impairment and long staying at the computer negatively influences on sight.

Besides, ecology also suffers from new inventions. Air pollution, deforestation, water pollution are caused by manufacturing. What can we do to protect our planet? We can plant more trees, reduce meat production (plants are used to feed animals), wear healthier clothes (fashion industry causes chemicals, water, emissions and waste products), unplug appliances (especially in production), control water using (especially on factories), choose wild energy.

Thus, technology makes every our day convenient, but we need to take care about our Earth.



## **SMART HOUSE ON THE PLATFORM ARDUINO**

*V. Dudarenko – Sumy State University, group SU-51  
N.M. Usenko – E.L. Advisor*

Projects of «smart» houses are currently being actively discussed and realized around the world. The aim of the «Smart House» project is to develop a system for the automatic control of lighting, temperature, humidity, alarm in the room, the apartment, the garage, the greenhouse and other places.

Smart house is a modernized residential house with modern automation tools designed for people to live. «Smart» means a house, which has a system of safe life, privacy and comfort of all inhabitants of the building.

One of the option is not to control only the operation of all systems, but also it is optimization, the main purpose of which is the economical using of energy and heat transfer media.

There are several types of «Smart house»:

- 1) wireless is given high speed and level of communication reliability and protection from external influences;
- 2) wired is more comfortable and has low prize.

Nowadays, there are many projects of «smart» houses. They are developed on various automation tools such as Arduino, OWEN and Siemens.

Arduino is a convenient electronic device to design their own projects for beginners as well as for professionals. Nowadays, Arduino platform is a popular product because of its simple programming language. Free software is available in the Internet. Another important advantage is that the programmer does not need a special device to transfer, because the transfer is via USB. Users can create their own programs with open code. Arduino products are flexible and easily interact with PC and mobile phones.

When designing the Smart house system, you should understand that this system can be automated to your own requirements, but it is easy to manage.

In conclusion, I would like to say that the «Smart house» system is not a luxury but it is a necessity to make our life better, more comfortable and safer.

## **PROSPECTS AND ADVANTAGES OF USING SCADA SYSTEMS**

*A. Hrychanyi – Sumy State University, group SU – 51  
N.M. Usenko – EL Adviser*

Supervisory Control And Data Acquisition(SCADA) is the main and the most promising method of automated control of complex dynamic systems (processes) in vital and safety-critical areas. Large-scale automated systems are built on the principles of supervisory control in industry and energy, transport, in space and military fields, and in various government structures.

Over the past 10-15 years, interest in the construction of highly efficient and highly reliable dispatch control and data collection systems has sharply increased. On the one hand, this is associated with significant progress in the field of computer technology, software and telecommunications, which increases the possibilities and expands the scope of application of automated systems. On the other hand, the development of information technologies, increasing the degree of automation and the redistribution of functions between man and equipment exacerbated the problem of human-operator interaction with the control system. Investigation and analysis of most accidents and incidents in aviation, land and water transport, industry and energy, some of which led to disastrous consequences, showed that in the 1960s a human error was the original cause only 20% of incidents (80%, respectively, due to technological failures). Then in the 90s the share of the human factor increased to 80%. Due to the constant improvement of technologies and the increased reliability of electronic equipment and machines this factor is still growing.

The study of materials about problems of building efficient and reliable dispatch control systems showed the necessity to apply a new approach when developing such systems: human-centered design, i.e. focusing primarily on the human operator (dispatcher) and his tasks, instead of the traditional and widely used hardware-

centered, which focused on the choice and development of technical equipment when building the system.

I would like to present an example of SCADA system. It is the process how to set up a connection via the Modbus protocol and exchange data via the OPC server and finally process data in the Master Scada. I also demonstrate how to control the microcontroller from the window of the operator of the SCADA system and how to send and receive signals. To sum up I would like to consider possible ways of development of this technology and the prospects for their development in future.

## **HIGH TECH ACHIEVEMENTS AND MODERN WORLD**

*Kravchenko T. – Sumy State University, group PM – 81*

*S.V. Podolkova – EL Advisor*

We live in the world of rapid technology growth. Just few years ago 3-D printing, artificial intelligence, space travel and other high technology achievements were considered impossible. Today we can hardly imagine our life without them, as technology has become its integral part and continues changing our habits and lifestyle. Some technological inventions which appeared during the last century, have changed our life greatly, especially the Internet.

The Internet is the enormous system of computer networks that use the Internet Protocol Suite (TCP/IP) to link devices in the whole world. It's a huge library, where you can find any information. Due to it we can learn news and communicate with people from different parts of the world. Clearly, why young people of today are called "digital" generation: they spend their time surfing on the Internet using computers. Personal computer is an electronic machine that accepts, processes, stores and outputs information. It's a powerful tool, that is designed not only for entertainment, but also for education, communication and work. Sitting at the computer we can have distance learning, read books, listen and watch video courses.

Other invention, that is worth mentioning, is a cellular phone, one of the most useful devices nowadays. It's multifunctional tool, which can be used as a camera, a music player, an alarm clock.

Mobile phone is a mean of communication, it gives us opportunity to speak or even have a live conversation with people, who are far away from us.

Virtual Reality(VR) is also one of the latest inventions. It's a three-dimensional environment created by computer, which can transport the user to any locations. VR has different capabilities. For example, children can even be in the center of the fairy tale and interact with the characters. It's widely spread in medicine. On one hand, VR helps in medical education and training, on the other hand, it is directly used to treat certain diseases.

On the whole, technologies are changing our world very fast. People produce more new tools and devices every day. Whatever your beliefs are, no doubt, that new inventions have an enourmous impact on our lifestyle.

## **SMART TECHNOLOGIES IN DAILY LIFE**

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*N.V. Maliovana – Ph. D., E.L. Adviser*

In the era of smart technologies and tools, advanced technological systems that allow the automation of domestic tasks are developing rapidly. Smart stuff has captured the imaginations of governments and industries around the world. In many developed and developing countries, the 'smart' tag is attached to all manner of things, including homes, phones, cars, communities, cities and even nations.

The definition of a word 'smart' means an ultimate desired state across all aspects of modern life. It consolidates ideals of efficiency, security and control in a technological environment. Moreover, it is employed by its proponents as a means of imagination and realization of the social and technological progress.

The usage of technologies becomes an integral part of daily routine life for many people.

Family Hub Refrigerator. With a Wi-Fi touchscreen, the Family Hub fridge lets the costumers view the calendar, notes, recipes, and the weather forecast. Besides, you can watch TV shows

or movies, or stream music through the screen. If you are at the grocery store and don't remember if you have some products? There's an interior camera that lets you peek inside your fridge through an app.

Smart TV. Buying a Smart TV can make your leisure better. With plenty of options of the size, screen resolution, and contrast features, deciding on one specific TV you can feel overwhelming.

There are thousands of televisions on the market nowadays, so what actually makes a Smart TV smart? The difference between a regular television and a Smart TV is the capability to surf the web. It allows people to download any music and videos, and browse the Internet via Wi-Fi. The users can watch YouTube or Megogo on a bigger screen and even flip through their social media pages.

Fitness tracker. It is a great way to monitor your activity and health with a minimum effort. The best and newest devices on the market keep tabs on your workouts, heart rate, stress and everything in-between with pinpoint accuracy.

The right fitness tracker will be based on your individual needs and affects active your lifestyle dramatically. Some look for step counting and reliable sleep tracking, others want built-in GPS for running, a heart rate monitor to deliver advanced resting heart rate data.

However, there are advantages and disadvantages of smart technologies. On the one hand, it makes lots of things and life easier and more enjoyable, saves time and money. On the other hand, there are problems with privacy and security, and difficulties with customizing of the devices.

Smart appliances have to be correctly installed and properly configured, and the users' knowledge of smart devices needs to be consistently increased. All in all, the current trend indicates that in the nearest future, more and more smart technologies will be developed very fast in order to create a more responsive and active environment.

## INTERESTING FUTURE TECHNOLOGY

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N.M.Usenko – EL Supervisor*

A lot of technological devices and tablets make our life easier and better. They surround us everywhere: at home, at work, in our free time etc. The purpose of this work is to describe some of interesting future technologies in different fields of human life.

Some extraordinary technologies will appear in our everyday life. The “smart” washing machine will be able not only to determine the type of tissue itself but also to select the type of washing. The kitchen surface in future will be smart and recognizes everything on it. A projector above the table will project on the work surface recipes and tips on cooking. It will be very comfortable and save much time.

Will it be something interesting in transport and roads? Surely, yes. High-speed trains will appear and their speed limit will grow up till 6400-8000 km/h. This speed will be achieved with the help of vacuum "pad" inside the tunnel. The Holland company announced the production of roads made from recycled plastic bottles. According to the Daily Mail, Plastic Road project is considered a “green” alternative to asphalt by its developers.

Technology will affect not only everyday life. Future army, for example, will have the rifle with the “smart” bullets that explode upon reaching a predetermined distance.

Some improved technologies will touch medicine in future too. For example, it will be the patch that will be able to monitor the status of the patient and independently support its body with the required amount of medication when it is necessary.

In conclusion, I want to say that a lot of technologies are being created and they really help people in different areas of their life.

# **AN AUTOMATED CONTROL SYSTEM FOR THE HYDROPONIC CULTIVATION OF PLANTS**

*Serhii Osadchii, group SU.m-81*

*EL Adviser O.R. Gladchenko*

The idea of an unreasonable plant culture is not new. Plant physiologists have been using nutrient solutions for laboratory research for more than 100 years. American scientists were the first to see the possibilities of industrial hydroponics: Alice and Swann in 1938, Turner and Henry in 1939, Gerick and Laurie in 1940. We have started research in this area too. Systems of groundless cultivation of plants (hydroponic systems) can be implemented in almost any climatic and geographical conditions. This makes them very useful in regions that often suffer from drought, or have very unfavorable conditions for growing crops.

But standing on the threshold of the 4th industrial revolution (industry 4.0), which will radically change our attitude to life and work. we do not know how it will develop, but it is clear that it will cover all spheres of industry, agriculture, and will radically change people's lives.

At the heart of the fourth industrial revolution there is an idea that changes the concept of production that was used before. As part of intelligent manufacturing automation, which is defined by software, machines that report their condition in real time, increase their efficiency and minimize downtime.

On this basis, it is possible to build a system for growing plants, which will have much better characteristics thanks to intelligent and machine controls and coordination. Optimization of operating costs and machine approach allows to move to precision farming. The technologies of precision agriculture identify discontinuity of the specific area. The farmer, using this knowledge, can localize the problem and fertilize or neutralize pests only in a certain area. In the process of monitoring the system using the knowledge and machine base, you can predict the time of ripening and harvest volumes.

## **MOTION SENSORS IN USE**

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*A. Samarski – Sumy State University, group EL – 81*

*N.I. Mulina – EL Adviser*

Despite how obvious it is to use smart technologies, there is still a place for advancements. Motion sensors (MS) are a good example of modern achievements application of electronics into practice. They are widely used in different equipment. A security system, for instance, might include many elements such as cameras, alarms, and lighting but it always includes motion sensors.

A MS is a device that uses different technologies to detect moving objects. Being an integrated component of a system, it sends a signal to a control panel that automatically performs a task or alert. According to the task, one can choose among various kinds of MS. There are two basic types of MS: optical and non-optical. Optical type active sensors use infrared energy, radar waves (ultrasonic, microwave) or other methods (tomography) to search an object or movement in the area they cover. Optical type passive sensors detect changes in temperature – heat of a human or animal – in the surrounding environment. They can be calibrated to trigger only at certain levels of infrared heat. There also exist dual technology MS that combine features to reduce false alarms.

Non-optical sensors can be split into inertial, mechanical, and magnetic. Inertial MS include accelerometers and gyroscopes. They transmit data wirelessly to a computer software system. Being attached to a subject, mechanical ones act out a sequence of movements. Magnetic MS serve the military as well as in medicine and door/window protection systems.

Motion sensors are promising devices and are also used in energy saving systems to activate and deactivate lighting devices, in automobiles to assist parking, in water supplying to prevent leaks and turn on and off water faucets. They are cheap, reliable and easy to implement and involve avoiding accident in traffic lights. It is important to know what technologies are employed and how they work to protect human lives and natural resources.



## A MIRACLE OF MODERN TECHNOLOGY

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*Podolkova S. V. – EL Advisor*

A few decades ago, we can't even imagine technology growing so fast. Nowadays it's possible such unbelievable things, that have been considered fiction for a long time before. Thanks to new inventions, our living standards are growing up with impressive rate. But the biggest and the most important contribution was made by technology to medicine. One of the most innovative examples can be considered 3d-bioprinting, as nowadays it makes possible to create even new organs for people who need transplantation.

But let's start from the very beginning. The first 3d-printer was invented by Charles Hull in 1983. It was named stereolithographic and opened the era of 3d printing. And then just in thirty years Thomas Boland patented technology of printing by cells. Since this moment printing organs has not been considered a fiction anymore!

The collaboration of two companies - Organovo, located in San Diego, specializing in regenerative medicine, and the engineering company Invetech, located in Melbourne, resulted in development of 200,000\$ bioprinter. One of Organovo founders, Gabor Forgac, has developed a prototype based on the new 3d-bioprinter. Organovo 3d printer is designed for production skin tissues, heart, blood vessels and other tissues that may be suitable for surgery and transplantation in future. Despite the imperfection of biodegradation technology, there are already several successful examples of its use. In particular, Spanish company BioDan Group, in collaboration with local research institutes, has developed skin printing technology on a 3d-bioprinter. After a certain period of maturation in the laboratory, this printed tissue can be transplanted (until now such skin has been transplanted only to mice).

At the moment, scientists are developing the instrument that will help achieve the ability to reproduce tissue directly on the human body. For example, scientists tend to learn how to print tissue for a person with burns just during an operation, and not to transplant it already pre-prepared sample of the skin. But it still remains the technology of the future.

## SOME ADDITIONAL RESERVES FOR INCREASING THE PUMP EFFICIENCY

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The question of reducing energy consumption in industry is becoming more and more acute for today. This is due to the constant rise of energy prices and significant environmental pollution.

One of the ways to solve this problem is to increase the efficiency of the pumping equipment. Electricity costs are characterized by the value of pump efficiency.

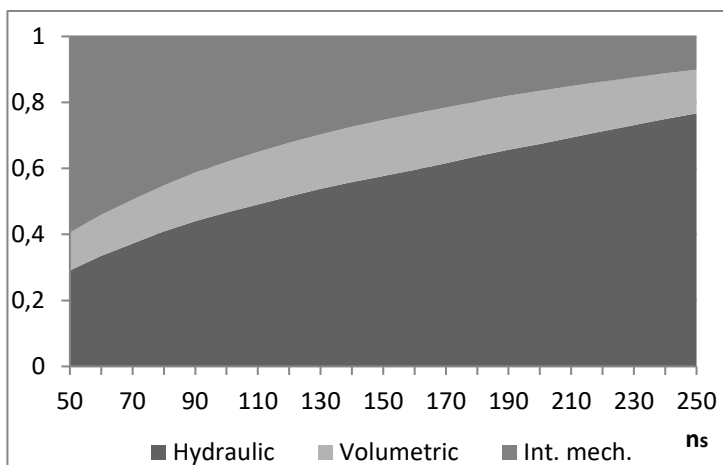


Figure 1 - The share of energy losses in a centrifugal pump

The most crucial point in the development of pumping equipment made so far is hydraulic efficiency. Nevertheless, the greatest weight is internal mechanical losses of energy. This is especially true for low specific speeds of pumps.

Hydrodynamic processes in lateral sinuses (axial clearance between surfaces of the casing and impeller) have significant impact on the volumetric and internal mechanical efficiency of the pump.

Consequently, there is a need to investigate the space around the rotor of the centrifugal pump more thoroughly.

## SMART CITY

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Every day the number of inventions is growing faster than a couple of decades ago. With the growth of technological discoveries, humanity is trying not only to improve and secure life, but also to facilitate it. Already there have been created robots, artificial intelligence, 3-D printers and much more. To improve the quality of life using information and communication technologies, the parent company of Google, Alphabet, decided to create a so-called “smart” city entirely built on the basis of the Internet along the eastern part of the Ontario waterfront in Toronto, which will improve service efficiency and meet the needs of residents.

According to the company, this project should become a model of twenty-first century urbanism. To begin the mass construction of technologically advanced cities, first you need to create a small area and test it.

Therefore, Alphabet has invested approximately \$ 1 billion in the creation of the “smart” Quayside district in Toronto with an area of 8 square kilometers, where the main office of Google Canada is going to be moved.

The territory of the district will be equipped with sensors and cameras that collect information about traffic, noise levels, air pollution, ambient temperature and monitor the operation of electrical grids, garbage collection, near delivery, air conditioning, street lighting and other necessary things for comfortable living in the city. Traffic around the city will be carried out using unmanned and ridesharing cars, which are monitored and sent using the application in the smartphone.

There will be houses, created from environmentally friendly materials, which for convenience and quiet construction, will be assembled at the factory. Numerous sensors and robots in the house will clean household waste water for reuse, distribute household waste for recycling for reuse or for anaerobic production of the

compos, so that as little as possible garbage is discharged to city landfills.

In order for people to spend more time outside, the company will build over the sidewalks and squares automatically opening and closing canopies protecting people from the rain, and for the convenience of cyclists and pedestrians. The roads will be equipped with heating to protect them from snow and ice.

However, many people have questions about the safety and security of the information received about the local residents. It should only be used to help the authorities and make life more healthy, safe, interesting and comfortable.

Perhaps soon, all the inhabitants of the planet will be able to live in “smart” Internet cities, which are created not only for convenience, but also for environmental sustainability. With them, the world can become much safer and comfortable.

## **TO MAKE THE WORD SMARTER AND SAFER**

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*Podolkova S. – E L Advisor*

Nowadays the introduction of the latest technologies in human activity can not be real without computers and other telecommunication equipment. So, the introduction of the latest technologies in the information society provides:

- active use of the fast-growing intellectual potential of the society;
- integration of information technologies in scientific and industrial activities;
- high level of informational service, available sources of reliable information.

Therefore, topical information gives us opportunity to use it for further technology advancements that make our life easier. Any science and technology innovation is based on early developments that were evolving hundreds years. Such inventions as telephones, cars, refrigerators have already simplified our being. As to the future prospects, Facebook, Virtual Reality, 3d-printers, Super lenses for drivers will soon be available for everyone.

Nobody should underestimate the importance of new technologies for medicine. Such new products as exoskeletons, artificial hearts, video tablets and DNA modification, are able to raise humanity to a new level of development, reduce mortality and increase human life expectancy.

Taking into account the rates of technological development in modern world, I think, it is not right time for social and economic changes, which take place as a result of ongoing working process. Nobody knows when trigger for changes will appear, so we have to work hard for making the world smarter and safer.

Next important issue is saving healthy environment for future generations. The ability to produce qualitative products for own benefit directly depends on our health. The environment affects our productivity and creativeness, so we should take care of yourself and environment for making the world smarter and safer.

## **ROBOTICS AND OUR FUTURE**

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The development of technologies is the leading sphere in the modern scientific space. Robotics has become particularly popular as a promising industry. Robots can be used in many situations, especially when working conditions are dangerous for people. According to the plans of scientists, robots are not only machines, but also smart devices that possess artificial intelligence. For several decades, scientists have been developing such programs that will enable robots to become fully educated members of society.

The first robot, whose creators achieved their goal is robot Sofia. It is famous not only in the technological plan, it is mentioned in the spheres of politics, economics, culture, management and social well-being. The media interviews Sofia, which generates Google search results and chooses one or another position on controversial issues. Who created it? What aim of it?

In 2015, Hanson Robotics used Audrey Hepburn's personality traits for a human-like robot that can learn and improve. David Hanson, its creator, pursued the goal of creating an artificial intelligence, capable of expressing emotions and showing the features of its character. Sofia simulates people's gestures, conducts simple conversations according to pre-programmed questions. The most global goal of scientists is to achieve the socialization of Sophia, which should help the elderly at homes or organize large-scale events. The software analyzes all of Sofia's actions and helps to improve them in the future. Robot Sofia travels frequently, recognized as a citizen of the world, but since 2017 it has got the citizenship of Saudi Arabia. It's interesting to note that there are hundreds of Sofia copies, which are still being improved in laboratories and were not presented to the general public.

Ilon Mask argues that robots can become a global threat to the life of all people. This statement is not groundless. At one press conference, the robot said that it would kill people. After a while Sophia said that she had just joked.

During many trips, Sofia met with many people and enriched her knowledge of languages, culture, science, business and economics. In Ukraine, she became a signatory to the Memorandum of Cooperation between the State Agency for Electronic Governance of Ukraine and Hanson Robotics and AngelVest. Sofia's creators plan to provide conditions for the development of robotics and artificial intelligence in Ukraine. So, there may soon be new jobs in our country.

Chief Financial Officer of Hanson Robotics claims that people expect this work to be even more advanced, namely, that it will be able to walk and dance itself. As it turned out, there is its prototype, which is less developed intellectually, but can move in space. Sofia has 60 emotions, it is planned to increase their number to 118. Also, the hyinoid recognizes and remembers faces. Now the task of scientists is to combine the possibilities of several devices of artificial intelligence into one robot that will serve humanity.

So, Sofia is an embodiment of the artificial intelligence that is developing very rapidly and may soon be introduced to the lives

of millions of people. That is why it is important to study the effects of robotics and monitor its development in order to prevent the power of robots over the world.

We all know that this is a rather promising field of scientific progress, therefore, we must support those who want to technologize and improve our lives.

### **BETWEENNESS CENTRALITY**

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Betweenness centrality has an advantage compared to closeness and betweenness in that betweenness centrality requires being calculated over a fully connected graph, or calculating within a single component. Even you can have multiple unconnected components, you still calculate the measure.

A component is a group of units that are all linked to each other in many networks. All the nodes are connected to each other, so they form a single constituent element, but in some networks we can have components, that are isolated from each other, so in those situations we would not be able to run a global closeness centrality.

Betweenness centrality is a measure, a bridge measure. In this case we calculate all the shortest paths between the nodes, then we calculate the fraction — the shortest paths going between any node, and then we sum up the fractions over all pairs of nodes.

$$\text{Betweenness Centrality of node X} = \sum_{\text{for all pairs of nodes}} \frac{\text{fraction of shortest paths that go through node X}}{\text{all shortest paths between every node}}$$

Nodes with high betweenness centrality are often significant controllers of power or info. If we expect that influence as an important thing in our network, we will take the note to betweenness centrality, considering the instance of users of any social network. When we look at positional analyses, we do not want to get hung up quite so much on the individual as the only one. We generally publish phenomena average data and you can

proclaim a graph, that may have ones and twos and things like that. But we are also interested in the generalizable properties of people. We are just emphasizing people with names to give you a clearer sense of the measures. But when we are reporting these things and thinking about them overall, or thinking what the impact of the position versus is, the impact of the concrete individual occupying that position and that difference is of great important distinction.

## **ENCRYPTION AS ONE OF THE MOST CRUCIAL TECHONLOGY FOR HUMANITY**

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Since ancient times, humanity has been concerned about security and privacy issues. This problem is especially acute now, in the 21st century. Almost every person now has a smartphone and spends several hours every day surfing the Internet or communication with others. This is done by using special apps – browsers or messengers. Most of them guarantee that our personal data doesn't get to the wrong hands through a method knows as Encryption.

Encryption make your information and access to it safe - from email to Telegram messages. Communication between you and the other side become totally secure. It's done by converting your data into a code making it impossible for others to access it.

Most popular messenger apps – like Telegram Messenger or WhatsApp use one of the safest encryption. When you use them, all message whatever your sent has its own distinctive lock and key, and only the sender and receiver have access to them. This prevents curious eyes from seeing the data in messages. For the rest of the world, government and even those companies itself, the transmitted information become impossible to read because no one else has the key to decode the content. This encryption is called 'end-to-end encryption'.

To make it easy understand, remember that most of us loved secrecy in our childhood. With our friends, we invented a cipher for



secret communication between you, so that no one, not even your parents, would know what it was about. Now there is a special algorithm for this, and it's not even that your parents, the government and the criminals do not know anything.

Most applications for communication of users use encryption and this is clearly seen in marketing. And indeed, it provides a good level of comfort when you know that your data is protected and securely stored on servers. With proper application of algorithms, the criminal can take many years to crack the data using brute force. Not to mention the fact that in the process of encryption, many data are encrypted using mixing and complex mathematical operations. Successful combination brings the chance of hacking to absolute zero.

There are many options for encryption with different levels of efficiency. For the evaluation of the majority, encryption rounds are used. The more rounds, the less chance of hacking your data. Naturally, knowledge needs to be applied correctly and to avoid mistakes in the code.

In any case, no one can say that hacking is completely impossible. However, in modern algorithms, the time taken to seek out the correct combination would be so much too long to ever be useful in one round. Even supercomputers will not help here.

The challenge to keep encryption as tight as doable is thus checking it's properly enforced and unbroken secure over time.

## **SECTION 2 ECOLOGY, LAW AND ECONOMICS**

### **ENERGY EFFICIENCY FOR UKRAINE**

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The energy efficiency of flats in Ukraine can quite easily be raised by several hundred %, by the addition of 15 to 20 cm of polystyrene based external wall insulation from below the ground to the top of the parapets. Roofs should be covered by 30cm+ of insulation.

Also, all radiators should be retrofitted with thermostatic radiator valves and all residents should be taught how to use these valves, as they have no experience of regulating their own heating.

The insulation should be clad with fire resistant cladding, which is weather resistant for the extreme heat and extreme cold of Ukraine. The window reveals can be covered with the same cladding to cover the edges of the insulation.

More can be done with a private house. Most houses in Ukraine are detached, so have a larger area than houses in cities in Western Europe.

Solar Thermal is one of the best options for Ukrainian houses (see above) because of the cold winters. ST vacuum tubes are the most efficient for operation on cold sunny days. They should be coupled with a large, well-insulated hot water tank, about 300L for a couple, 500-1000L for a family. This allows them to store hot water, and be heated by multiple sources (wood burner with a back boiler, gas or electricity).

Solar Photovoltaic can be used for generating electricity during sunlight hours, either grid-tied (producing 220v) or off-grid (12V, 24V, or 48V commonly) if you have an electric car. Seasonal Thermal Energy Storage is really the holy grail for renewables. Heat is stored deep underground, to be used for heating in winter. You need a large volume of ground to do it, but the usual place is directly under your house, so any heat leaking upwards heats your house! Also, the house adds to the insulation, as it is normally 15-

20 degrees in winter, when it's cold outside. Many water pipes are used to move the heat around, warming up in summer and autumn, and using its heat, usually via Underfloor heating in winter and early spring.

There are many different forms of heat recovery, one of the most common is mechanical ventilation and heat recovery which uses a diamond shaped air-air heat exchanger to warm incoming fresh air using outgoing stale air, and distributing it around the house in ducts. Waste water heat recovery can also use the heat in waste water, e.g. shower, bath, washing machine, to heat a hot water tank, exhausting it at close to freezing into the drains.

### **NEW WAY OF RECYCLING**

*O. Novikov – Sumy state University, group SU-51*

*N. M. Usenko – E.L. Advisor*

People have always polluted their surroundings. However, until now pollution was not such a serious problem. Why? Technological progress allows replacing most of the materials by plastic. Due plastic properties and the price of production, absolutely it used in all spheres of production. Nevertheless, this innovation is one of the reason of global environmental pollution. More than forty percent of the world's waste is different types of plastic. It degrades very slowly. The current goal of many scientists is to solve the problems of environment pollution by plastic.

One of the most promising directions in the recycling of plastic is 3D printing. 3D printing or «additive manufacturing» is the process of creating three-dimensional solid objects of any geometric shape, which is based on the digital model. 3D-print is based on the concept of building an object sequentially applied layers that display the contours of the model. Plastic waste can be used as consumables for 3D printers. It will reduce the cost of those processes and promote the idea of recycling in society.

Nowadays, the scope of the 3D printing is very wide. Domestic 3D printer can print any plastic item from the mechanical prosthesis to cover your phone. It also opens up new opportunity to

designers and engineers in projects. In the future printers will be able to print food, home, metal parts and human organs. Currently, 3D printers have one problem with speed of printing. If printers lost this shortage, 3D printer would be in every home. In addition, it will become a common thing like a microwave oven or fridge.

One of the most common type of plastic in trash is PET. It is thermoplastic polymer resin of polyester family, which used in fibers for clothing, containers for liquids and foods, thermoforming for manufacturing.

In order to use a PET waste for 3D printing, you must sort it, make it clean and grind. Then it is necessary to heat the shredded plastic to a fluid state and form a wire of a certain diameter. Items printed with such plastic will have high strength and low cost.

## **ABOUT THE PROCEDURE OF SELECTING AND APPOINTING ASSISTANTS TO JUDGES IN UKRAINE**

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According to the Article 61 of the Code of Administrative Justice of Ukraine in the wording of 10/03/2017, the Assistant to the Judge is the participant in the trial. Such a decision appears to be erroneous [1]. A judge's assistant is not an independent procedural figure, which affects the course of the trial, does not accept procedural decisions, does not bear any responsibility for the actions against other participants in the process, but only helps to resolve the case prosecuted by a judge.

Assistants to judges carry out purely auxiliary, technical functions, as well as computer technicians, archivists, other staff of the office, who also provide organizational support for judges, but are not assigned to the participants in the process by law [2].

At the same time, special attention should be paid to the provisions regulating the legal status of assistants, and it deserves

part II of Article 70 of the Law of Ukraine "On the Judiciary and the Status of Judges" [3], which provides that the selection of candidates for a judge position, who have at least three years of experience in the position of the assistant to the judge, is carried out with the features determined by the decision of the High Qualifications Commission of Judges of Ukraine, as well as Part 3 of Article 157 of the said law, according to which judges independently carry out the selection of assistants appointed and dismissed by the head of the court of the relevant court and the submission of a judge.

When analyzing the regulations on the assistant judge, it seems that the norms specified therein were created and accepted by people ignorant of the essential needs of the court activity.

In addition, the provision of special privilege to assist judge's assistants during the selection of candidates for the position of a judge (Part 2 of Article 70 of the Law No. 1402-VIII) in the form of shortening the period of study at the National School of Judges to three months instead of twelve, unlike other participants in the selection [3], only given that they have at least three years of experience as an assistant to a judge, is unjustified and violates the principle of equality of conditions in the selection of candidates for positions of judges. The situation can be corrected by improving the selection procedure for the position of judge's assistants, namely the introduction of compulsory six-month training at the National School of Judges according to a special curriculum of persons who will later intend to take the position of an assistant. By the end the training candidates have to pass the test of the knowledge of legislation, as well as an exam of drafting projects of simple procedural decisions. Upon completion of the training, it is advisable to form a list of persons who have successfully passed it, with the information about the candidate: the surname, name and patronymic, date of birth, citizenship, higher legal education and the acquired educational qualification level, experience in the field of law (if available), fluency in the state language and test scores gained at the National School of Judges. If necessary, the judges will be able to open the relevant Registry, review the list of persons contained therein and send an e-mail message to the National School of Judges

on the availability of the vacant position of the assistant and data of the person who they consider may be recommended for appointment.

Subsequently, the National School of Judges conveys information to the applicant in relation to the intention of the judge to decide on the possibility of appointing him as an assistant and submitting a personal application to the judge and other necessary documents.

Judges decide on their own whether to appoint a candidate as an assistant, that is, the Register's data should be purely informational in order to select qualified staff from among those wishing to obtain this position.

The abovementioned measures will facilitate the selection of the assistants to the judges, who are usually difficult to find a responsible, experienced worker with an appropriate professional level and sufficient business qualifications in view of the specifics of work in court, and will justify the introduction of a shortened term for theoretical and practical training of a candidate for a judge position, who has worked for at least three years as an assistant to a judge, at the National School of Judges of Ukraine by a decision of the High Qualifications Commission of Judges of Ukraine. It is advisable to establish for this category of candidates a six-month term of study like other candidates without experience of such work.

Taking into account the previous six-month training period for a judge's assistant, the total length of training for a judge candidate from among the assistants to the judges at the National School of Judges will be twelve months, as well as for other applicants for the position of judge. In the case of the selection of a judge's assistant without the use of the Register of applicants for the post of assistant to a judge of general jurisdiction, such person must necessarily have a probationary period in order to verify his readiness to perform his assigned task qualitatively and receive an idea of the internal organizational work of the court.

Ukrainian legislators should follow Polish example. Pursuant to their regulations included in the Act of 27 July 200 1, on the system of common courts, as a judge's assistant can be employed a person who has Polish citizenship and enjoys full civil rights, is of

impeccable character, completed university studies in Poland in law and obtained a master's degree or foreign studies recognized in Poland, is at least 24 years old and completed a general application, which is run by the National School of Judiciary and Prosecutor's Office or who passed the judge's or prosecutor's exam or completed a notary, attorney or legal internship and passed the relevant exam [4].

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## **CONSERVATION OF ECOLOGICALLY FRIENDLY ENVORNMENT**

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Today, saving of environment is the most discussed topic. For example, solving problem of global warming, acid rain, pollution, extinction of certain animal species, water shortage, destroying ozone layer, etc. Many scientists want to find the best solution.

There are a lot of reasons of vast pollution of the surrounding environment on our planet. One of them is a great number of petrol-driven cars in the streets. Searching more and more new inventions

people have completely forgotten that natural resources are limited. We must stop emission of harmful gases into the atmosphere. Such human actions can lead not only to different pollution but also to global warming. This problem really touches all countries in the world and is considered to be global.

So what can we do to protect the environment? There are a number of ways you can do in our everyday life. For example:

- find new ways to use old things;
- turn off appliances and lights when you leave the room;
- use public transportation instead of your own car;
- pick up litter wherever you go;
- bring your own bags to shops;
- eat less meat;
- try to avoid plastic things;
- grow your own food;
- plant trees;
- sort the trash;
- try to use less nature resources;
- try to protect wildlife in your area;
- reduce your personal footprint.

So, together, we can change the world. There is so much we can do to protect animals and environment but we must make these changes right now. The most important thing we must do is to open our eyes and start acting immediately.

## **ECONOMICS OF SOCIAL CHANGE**

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We live in the age when traditional questions about role of governments, about work, about human relations, seem to be reconsidered according to the force which is operating beyond anyone's control or consent. Everywhere everything seems to be being reduced to the value of a commercial commodity.



But it is also clear that more and more people are searching for real alternatives to the direction in which our society is heading. People are eager to have positive change.

This desire for change is based on the supposition that our economic institutions are beyond our control. Those decisions that affect our lives every day are made not for our benefit, but for the benefit of the powerful and the privileged people. And the social values that are the lifeblood of community are constantly corroded by an ideology that considers all things to be subservient to the market. This simplistic "economism" is not only deeply destructive; it has also assumed the trappings of dogma.

Possible that the most dangerous outcome of corporate capital and the ideology of commercialism triumph is the demolition of people's capacity to accept an alternative. When the intervention of globalization undermines local culture, we are told there is no alternative. We have to make the option to adapt or to perish.

But alternatives exist, they implement an approach to economics and social relationships that is capable to distribute economic benefits justly and to preserve the sense of human solidarity.

In fact, economic change is a change in the structure of economic system. It results in society, culture and everyday life changes on a global basis. Economic change caused by technology, politics and progress is a characteristic feature of history. The illustrative examples of economic change are following.

Social change leads to alteration of the society social order. It might include changes in social institutions and behaviours or social relations.

## **HUMAN TRAFFICKING IN UKRAINE AND THE WORLD**

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Today human trafficking is one of the most profitable criminal businesses, which takes the second place after arms and drugs trafficking. Human trafficking affects all countries and regions of the world. The International Labor Organization has recently published a global assessment of forced labor, including forced labor as a result of human trafficking. The number of victims of forced labor in the world is estimated at a total of 2,450,000 people, but this is only official statistics. Despite the developed legislative framework and preventive measures, Ukraine is one of the largest "suppliers" of the labor force in Europe, and is the country of origin, transit and destination in the trade of men, women and children. According to the police of Ukraine 186 human trafficking cases were discovered for the first six months of 2018 and 144 cases over the same period of 2017, that is, the number of injured is increasing. The main cause of the development of the slave trade in Ukraine is a critical socio-economic and political situation. Ukrainian citizens go abroad for employment purposes and are looking for any opportunity to earn money. The ways of recruiting them for a similar "work" are diverse. The most common ways to recruit people are employment agencies, media ads, dating through the Internet, as well as travel abroad through marriage agencies, travel agencies, and departure for education. Traffickers offer their future victims attractive employment opportunities abroad. After arrival in the destination country, the victims are taken a passport from, physical and mental violence is applied to them, they are required to work out the money spent on the insurance of documents, visas and tickets. The victims happen to be in a planned indebtedness that is constantly increasing. Traffickers use physical violence, imprisonment, various mechanisms of psychological and financial control to intimidate their victims. According to the statistics of the International Organization for Migration the Russian Federation (45%), the EU

(28%) and Ukraine (6%) are the main countries where Ukrainian citizens are victims of the slave trade. Among the main forms of exploitation are sexual, labor exploitation and begging. If sexual exploitation prevailed in 2010, the labor slave trade is becoming more and more popular nowadays. There is also an increase in the number of cases of forced begging, where the victims are people of all age groups, including newborn babies and the elderly. Today 58% of all victims of the slave trade in Ukraine are men and 42% are women, that is, the demand for men and women is almost the same.

## **PROSPECTS FOR BIOGAS PRODUCTION FROM MICROALGAE**

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According to statistics, world oil reserves will last for 56 years. In connection with this, bioenergy dominance in the development of the global energy supply system is expected. The use of biofuels from renewable raw materials will reduce the use of non-renewable natural resources, improve fuel performance, reduce environmental pollution and solve the problem of greenhouse gas emissions.

The purpose of the work is to establish the peculiarities of the third generation biogas production process and to select the optimal raw material for its production.

Third generation bio-gas is gas that is formed by anaerobic decomposition of biomass of algae using certain groups of microorganisms. The technological process of producing fuels from algae is almost non-waste. Dry biomass emissions retain all vitamins and beneficial properties, and can therefore be used as an additional source of food in fish breeding and livestock production. In addition, it is possible their transformation into another type of energy such as fuel briquettes.

The application areas of this resource are significant, they include the following aspects. It is possible to produce energy from biogas. At the same time, the waste heat that is formed can be used. Therefore, biogas offers interesting opportunities for decentralized

energy supply and is an effective alternative, especially for large agricultural enterprises in Ukraine.

Biogas can be used at the place of its production as a fuel.

According to scientists from the US Department of Energy, seaweed can provide at least 50 million tons of dry raw material for biofuel production annually. According to the most significant results of the implementation of the cyanobacteria biomass use to obtain energy is to improve the quality of water and, as a result of environmental rehabilitation [1].

Cyanobacteria occur everywhere, since they have pronounced adaptation possibilities. The ability to absorb certain gases (carbon dioxide for photosynthesis, oxygen for breathing, hydrogen sulfide for chemosynthesis and nitrogen for fixation) allows one cell to grow 1020 daughter cells during the growing season (70 days) and leads to their massive development that is the "flowering" of water. Therefore, the actual aspect is the production of energy from biomass of cyanobacteria, collected during the period of "flowering" of the water area. It is microalgae that is the most promising utilizer of solar energy. Microalgae: the maximum value of the efficiency of photosynthesis reaches 20%. The energy contained in 1 m<sup>3</sup> of biogas is equivalent to 0.6 m<sup>3</sup> of natural gas or 0.7 dm<sup>3</sup> of oil or 0.6 dm<sup>3</sup> of diesel fuel [2].

Biogas is formed as a result of the natural process of microbial decomposition of organic matter in a humid environment under anaerobic conditions. In a fermenter (bioreactor), naturally occurring bacteria cause fermentation of organic matter, similar to that occurring in ruminants of ruminants. Cell membranes of untreated algae are difficult to penetrate, and their use without processing to obtain energy is complicated. From the biomass that was previously treated in the field of hydrodynamic cavitation, the possibility of lipid extraction would be about 80%, while without the prior processing the ability to extract lipids drops to about 25%.

Cavitation is an effective method of hydromechanical intensification of chemical, food, pharmaceutical, biological and other processes. The effectiveness of the cavitation process is ensured by the cavitation fracture of the solid phase, the turbulent

diffusion of the boundary layer of the fluid by cavitation bubbles, and the aspects of the mass transfer of stairs, which are characterized by high values of the mass transfer coefficients. Processing of biological objects in the cavitation field can be used as a stage of preliminary processing of cyanobacteria in order to increase the mass transfer surface for subsequent extraction or biochemical processes. The results of the microscopic analysis showed that for some modes of treatment of liquid substances in the cavitation field, there is a decrease in contrast cells, as well as damage to the cell membrane, loss of clarity of contours, aggregation and mechanical damage [3].

Unlike wind and solar energy, biogas is capable of carrying the basic load, since it is produced continuously and regardless of weather conditions, and is also used for energy production. Given the constant supply of energy, biogas and biomethane are also suitable for balancing power and compensating for fluctuations that arise when other renewable energy technologies are used.

Thus, biomass as a renewable energy source creates great prospects for Ukraine, and its use in energy is very diverse. Biogas can be used differently and thus opens up numerous possibilities for its use.

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## **SOCIAL PREVENTION OF UNEMPLOYMENT AMONG YOUTH**

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It is known that labor activity is an integral part of the life of practically every young person but it is difficult to start it in the conditions of a socio-economic crisis and therefore modern youth has serious problems with employment. The lack of experience and practical skills does not allow young people to compete with more experienced workers since most Ukrainian employers are not ready to hire workers who need to be trained and to spend time and money on them. In this situation unemployment among young people is increasing. It should also be said that community development requires active participation of its members, including the process of employment in the community itself. As for youth, it is not just about active employment position, but about an active position in the growth of their professional potential, which can be achieved, for example, through work in public places.

According to Article 1 of the Law of Ukraine "On Employment of the Population", "unemployment is a socio-economic phenomenon, in which some people are not able to exercise their right to work and receive wages as a source of existence" .

Also, according to the provisions of this law, a person aged between 15 and 70 can be considered unemployed who, due to lack of work, does not have earnings or other income provided by legislation as a source of income, is ready and able to begin work.

It should be noted that the legislation of Ukraine pays a lot of attention on the employment of young people. So, in the Labor Code of Ukraine, there is even a separate chapter "Youth Work" that deals with these issues.

S. B. Ivanitsky and I. O. Morokhovets note that: "Unemployed youth is a special social group that at some time does not have such value as work associated with its prestige, material well-being and universal recognition. This significantly affects the

general motivation of young people's behavior, the motives for choosing and mastering the profession or retraining. "

As to the unemployment rate among young people in Ukraine today, in the Analytical Review of the State Employment Service of Ukraine "Youth in the Labor Market" for 9 months of 2016, it is noted that: "The employment rate among people aged 25-29 was 70.1% and then higher than the average among all age groups (56.5%), and among persons aged 15-24 this figure was only 27.3%. The unemployment rate, determined by the International Labor Organization methodology, among young people aged 25-29 over the 9 months of 2016 amounted to 11.1%. Among those aged 15-24, this figure was 22.8% and then more than twice as high as this indicator among all age groups. The high unemployment rate is due to the fact that a significant part of young people do not have necessary professional skills and experience.

Thus, we see that the problem of unemployment among young people is very relevant in our time. It should be noted that the opportunities for employment of young people are influenced not only by the socio-economic situation in the country, but also by their individual psychological peculiarities.

O. Posatsky notes that: "In the context of the way of life, the experience of the future as a problem is necessary for an individual primarily for his own development: a person must always have some doubts about the possibility of realizing significant events in the future. We believe that such an experience fulfills an active-adaptive function.

However, if the experience of the future as a problem goes beyond the norm, in this case young people need help, because the high degree of experience of the future as a problem negatively affects the process of life self-determination of young people. Thus, in the juvenile age, motives related to the distant future are put forward. Boys and girls are actively predicting the future, building life plans. The intentions of the person, requirements and living conditions often form contradictions. Internal (desire, intentions, goals, plans) interact with external (objective conditions and circumstances), resulting in some aspects of life which can be

perceived by young men and girls as problematic. The awareness of the obstacles that may arise in implementing significant events in the future, affect the attitude of boys and girls to their future. Such a form of identifying the attitude towards the future is defined as experiencing the future as a problem which arises when the awareness of the contradiction between the subjectively desirable and objectively possible prevents the implementation of significant events in the future,.

The content-semantic filling of the image of the future in the juvenile age has a psycho-emotional color and is a source of personal experience. The main experiences are associated with the image of the future are hope and at the same time with anxiety and fear. The outlined problem requires the use of well-meaning psycho-counseling and psycho-corrective efforts in order to optimize the confident perception of modern young people by their future and their successful self-actualization in difficult peripetias of their own life path.

V.Y. Kreschenko and O.M. Grinova believe that: "Juvenile age is one of the key periods in the design of a person's life path. It is in his youth that the person performs personal and professional self-determination, acquires identity, makes the construction of strategic life goals and plans for their implementation. At the same time, at early age, the individual acquires the full civic and social maturity for the first time, and therefore does not have a life experience of free, responsible and subjective creation of his own biography. Therefore, the processes of self-creation and self-realization of youth are largely determined not only by personal but also by social determinants. The latter include gender stereotypes. The formation of rigid, spurred attitudes of a person regarding the definition of his place in life as a woman or a man greatly restricts the freedom of self-realization and horizons of the world of life. Therefore, the study of gender stereotypes and their impact on the personal growth and self-actualization of modern youth has a high relevance and social significance. Gender stereotypes represent a complex psychic entity that manifests itself in different modes of the human life field, namely, it contains traditionally female and male personality traits,



gender-specific activities, in particular the professional, gender ratio of occupations and social roles of men and women, a stereotypical assessment of the attractiveness of men and women.

It should be noted that the main problem of youth in employment is the lack of necessary work experience. At the same time, in order to obtain this experience, it is necessary to be employed. This problem is a closed circle. Therefore, we believe that measures to prevent youth unemployment should be aimed, first of all, at obtaining the young people the necessary professional skills and practical work experience.

In our opinion, the activities of public organizations may contribute to the solving of this problem. Being a member of an active public organization, a person receives certain organizational skills, expands the range of contacts, studies the work with the documentation, the basics of accounting, etc. In addition, there are youth organizations whose activities focus on the professional development of young people and their familiarity with employers. It should also be noted that, above all, the main thing is that participation in community activities contributes to the development of the community as a whole.

Consequently, we believe that engaging in the activities of public organizations can be one of the most effective technologies for preventing unemployment among young people and contributing to community development.

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## **ENVIRONMENT PROTECTION**

*Tyshchenko M. - Sumy State University, group PM – 81  
Podolkova S. V. – EL Advisor*

Every day people buy a lot of new clothes in stores, spend money on things that they do not always need in their life. Phenomenon of a social and economic order that encourages the purchase of goods and services in ever-greater amounts is called consumerism. The purpose of this paper is to tell about the problem of excessive consumption and how it affects the environment.

At the moment, we have about 1.3 billion tons of material every year going into landfills. By 2100, it is going to be about four billion tons. There are several ways to avoid increasing landfills and preserving the ecological environment of the planet. First of all, it is necessary to bring into lessons of ecology more practical classes, which will show them how to thrift, consider materials when they go into products and when they get used, and decide how they can be used again at the end of their life. People can give used or needless clothes for recycling or hire out to vintage or “second hand” shops. Nowadays, in the world there is a trend of recycled things, so many international companies are exchanging old things for discounts on new ones. In this way, it will be profitable both for the consumer and for the environment. Secondly, companies can provide ways of

attracting of materials that can be processed more than 2 times. Metal, glass, aluminum, steel can be recycled as many times as they need to be recycled. In this case, Ukrainian construction firms can remanufacture details of old houses, saving money on material. Also, they need to work out the conception of “green towns”, where alternative energy sources will retain endowments of nature and less pollute the air.

To conclude, when people buy things, they should think not about fashion or beauty, but about the possibility of long-term use of product. It is also necessary to build a culture of recycling that will help change people's awareness of considering materials to new resources, which can be used again.

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## SECTION 3 ADVANCEMENTS IN MEDICINE

### ENGINEERING INNOVATIONS FOR MEDICINE

*M.E. Besedin, student, Sumy State University, group IM-81*

*T.V. Pochatko, English language adviser*

As I am a first-year student of Engineering faculty, the research of engineering innovations is of great interest for me.

The role of engineers to any society has historically been of great importance, and that trend is only likely to increase over time. In modern society, we are constantly interacting with our environment. We harvest and extract all the resources that we need to sustain human life and our culture. It is the role of the engineer, however, to minimize the effects of damage on the surrounding ecosystems, and design necessary infrastructures that are both efficient and safe. Engineers aim to benefit the people of the present by employing effective structures that are intended to improve transportation and living habits of earth's inhabitants. So engineering is considering the continual growth of the human population and ensuring sufficient resources for the people of the future. Engineers must be efficient, taking into consideration construction costs, time, and the wellness of people. No country or society today would succeed without the adoption of engineering at some level. Engineering and engineers have had an enormous impact on every aspect of our modern lives. [1,2]

I was interested in the latest developments in the field of medicine very much, because in the modern world there is a huge number of illnesses and diseases. But unfortunately many diseases remain incurable. Besides drugs, innovative devices are also necessary for inspection of an organism and detection of diseases at early stages. For this reason it would be desirable to tell you about one such rather modern invention – **O2amp** are glasses through which it is possible to indicate a disease. The 2AI Labs research group created **O2amp** glasses which allow to determine saturation of skin of the person by oxygen, concentration of hemoglobin in its blood and frequency of heartbeat. They will also help to find veins

under skin, to reveal internal and superficial injuries and also some types of diseases. As for me, it is magnificent innovation in the medicine. Twenty years ago it even could not be presented. Thanks to these glasses it is much easier to do similar actions for the inspection of a whole organism. Nowadays X-ray is often used for detection of diseases. But is pretty unhealthy. The **O2amp** glasses do not cause any harm. [3]

Here one more surprising invention – **the Da Vinci Robot surgeon**. This is the robot which will not be able to play a guitar as authors of the movie "The Guest from the Future" dreamed of it, but can perform the most difficult medical operations. However, under control of the person who will sit at the control panel standing nearby the droid. This difficult mechanism will allow to automate many processes and to carry out the most precisely and surely even the smallest manipulations. More and more operations will be successful. [3]

Finally, a significant focus of engineering is its connection with globalization. As technology and design progresses, it is important that we keep in contact with the rest of the world. Engineering, as a profession, is of incredible importance today and has been since the beginnings of our species. The work of countless engineers over the ages has changed our lives forever. So why are engineering innovations increasingly important? Because everything around us wouldn't exist without them. This is not going to change anytime soon. [1,2]

Electronic resources:

- 1) <https://ru.scribd.com/doc/56981129/The-Importance-of-Engineering-to-Society>
- 2) <https://interestingengineering.com/why-engineers-are-becoming-increasingly-important>
- 3) <https://novate.ru/blogs/230713/23540/>

## **GMO PEOPLE**

*O.V. Davidchenko – Sumy State University, LS-708*

*V.S. Kurochkina – EL Advisor*

Everyone has heard some information about genetic engineering. But what will happen if we apply it to people? Do we have enough information to modify our DNA? Can it be dangerous?

Some months ago Jiankui He said that two girls from China, Nana and Lulu, were born with modified DNA. Right after sending sperm into mother's eggs, an embryologist also sent in CRISPR/Cas9 protein and instructions to perform a gene surgery intended to protect the girls from possible HIV infection.

“While CRISPR/Cas9 has been studied in human cells and in clinical trials, gene surgery in people's embryos intended for pregnancy has not been reported yet. To assess the girls' genomes for safety after the surgery, multiple whole genome and targeted deep sequencing techniques were used before implantation, during the pregnancy, and after birth.”-said Jiankui He about experiment.

This information hasn't been confirmed yet, but we already can imagine how we will be able to improve human genome. Humans have used genetic engineering only since 1996 and scientists have made a breakthrough. And maybe in the next few years we'll see people with incredible characteristics. It doesn't mean that people will have more hands or superpower. No, the most important power that our children will earn is the ability to defeat incurable diseases like cancer, HIV, down syndrome and many others.

But we have some problems here. Some people are not ready for this. They think that GMO can be dangerous. And they are right. Because when using something we must be sure that it will not kill us in the future or will not make over problems. That is why we aren't ready for GMO people today. But if we know that it is absolutely safe, than humanity will move to a new stage.

So, as we can see, genetic engineering of human genome offers great promise to us, but we need a bit more time to check and observe that it is safe for us. Then, it may make our life better and will not make unpleasant surprises in the future. It gives us incredible opportunities and we must use it.

## LUNG DISEASE

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*V.S. Kurochkina – EL Advisor*

The respiratory system is involved in the process of respiration, which supplies oxygen to cells within the body and removes the waste product carbon dioxide. Let us consider some diseases of the system, lung diseases in particular.

Lung diseases are one of the most serious global health problems today. The success of treatment depends on their timely and correct diagnosis, as well as the correct selection of ways to combat these diseases. If you try to make a complete list of all lung diseases, a total of more than forty names of ailments of different nature will be on the list, including: bronchitis, emphysema, asthma, cancer, pneumoconiosis, lung vascular diseases, tuberculosis, pulmonary fibrosis, lung abscess, etc.

The most common lung disease is cancer. People who smoke have the greatest risk of lung cancer, though lung cancer can also occur in people who have never smoked. The risk of lung cancer increases with the length of time and number of cigarettes you have smoked. If you quit smoking, even after smoking for many years, you can significantly reduce your chances of developing lung cancer. Asthma is an inflammatory disease of the airways to the lungs. It makes breathing difficult and can make some physical activities difficult or even impossible.

Tuberculosis (TB) is a potentially serious infectious disease that mainly affects your lungs. The bacteria that cause tuberculosis are spread from one person to another through tiny droplets released into the air via coughs and sneezes.

Pneumonia is an infection that occurs in one or both lungs and can range from mild to life-threatening. Pneumonia is an infection of the alveoli, usually caused by bacteria.

So, lung diseases are some of the most common medical conditions in the world. Smoking, infections, and genetics are responsible for most lung diseases. Lung disease can result from problems in any part of the respiratory system.

## THE X – RAY PILL

*A. V. Hrechka – Sumy State University, group Mc.m – 801  
N. V. Maliovana – Ph.D., E.L. Adviser*

Going to a doctor can be a nightmare and a shock for most people, especially when somebody hears a word «endoscopy». This procedure is specific, unpleasant and requires a special preparation, so patients tend to avoid it. That`s the past! A company Check Cap from Israel, which is headed by a medical engineer Yoav Kimchy, has patented a pill containing a wireless sensor that acts as an X-ray. It`s a product that allows to screen for a colorectal cancer using the procedure like taking the pill. How does it work?

The swallowable pill has an X-ray source, a positioning system, computing components and a battery. It has just a 3 centimeters length and a 11 millimeters width . Unfortunately, to swallow it is too hard.

Before the procedure a patient should have a diet ( a lot of water, tea, juice, bouillon). In the day of procedure doctors recommend not to eat and not to drink. Furthermore smoking is also taboo. 1 litre of polyethylene glycol must be drunk for colon cleanser.

Firstly a patient needs to swallow a contrast agent and then he or she should wear special sensors attached to the skin in the area of the colon, and as the pill moves through, the sensors are able to pick up images and location. The pill needs from 8 till 14 hours to present the result of its work. It makes 2 images per second.

When it gets to the colon, it begins to emit signals in all directions, estimating the distance to the intestinal walls. In this way it receives an image of the internal surface of this organ. The data is sent into a wireless plaster that tracks pill`s movement. The pill is disposable, so it comes out naturally without any medical supervision. The patient transfers the plaster to the doctor, and after several minutes he gets a 3D image of the intestine. Then the doctor will combine the photos of the internal colon in order to give his or her qualified opinion.



Today this procedure is available at private clinics of Kyiv such as a diagnostic centre "City clinic" and others. Its price is about 15 000 hryvnias. Everyone can check the intestinal's condition in our Sumy medical centre «Adonis».

What advantages does the X-Ray pill have? First of all, it doesn't cause any pain and you don't use the anesthesia. Secondly, it is a safe method, the pill is steril. Thirdly, this procedure is comfortable. A patient has the opportunity to move quickly, watch TV or does his/her daily activities.

The X-Ray pill can diagnose more than 90% diseases of a gastrointestinal tract. Can you imagine that it can find a polyp that is only 5 millimeters? That's why this procedure is much better than a standard endoscopy or the X - Ray.

What is the most interesting thing? According to the words of Check Cap, the procedure is no more dangerous than one fluorography or two airport full body scans.

In conclusion, it is obvious that this method is something new and an improved version of a standard endoscopy. No doubt the X – Ray pill will be available for all layers of the population because diseases of the colon is increasing, especially for elderly people. Thanks to this pill these diseases can be diagnosed in the early stages and cured successfully.

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## EMOTIONAL STATE OF A MODERN MEDICAL STUDENT

*R. O. Hreshylo - Sumy State University, M – 701*

*N. M. Usenko – EL Advisor*

Emotions are every person's psychological reactions to good and bad. Emotions (passions, emotional excitements) are called states such as fear, anger, anxiety, joy, love, hope, sadness, disgust, pride, etc. Emotions have a positive or negative emotional tone associated with a sense of satisfaction or dissatisfaction. The emotional state directly affects the quality of the student's training, which is why it is necessary to study and monitor it.

Emotions affect people in a variety of ways. One and the same emotion influences people in different ways, moreover, it does not have the same effect on one and the same person who falls into different situations. Emotions can affect all systems of the person. Electrophysiological changes occur in the facial muscles during emotional experiences. Changes occur in the electrical activity of the brain, in the circulatory and respiratory systems. With severe anger or fear, the heart rate may increase by 40-60 beats per minute. Emotion activates the autonomic nervous system, which make changes in the endocrine and neuro-humoral systems. The mind and body are need to be in harmony for action. It has long been known that emotions, like other motivational states, affect memory, thinking and imagination of personality. Anger human has only "angry thoughts". In a state of increased interest or excitement, the subject is so entangled in curiosity that is incapable of learning or research. The emotions and complexes of emotions that a person feels in one or another period of time affects virtually all of his work in the field of work or study. When person is really interested in the effectiveness of her activities, she is full of passionate desire to achieve certain results. When emotions over a period of time have a negative effect on activity, this can be called an emotional (often "professional") burnout. ). The burnout syndrome includes three main components: emotional exhaustion, depersonalization, reduction of achievements. Under emotional exhaustion is a sense of

emptiness and fatigue caused by your own learning. De-personalization involves a cynical attitude to learning and its objects. Reduction of achievements - the student's sense of failure in the study, there is a view that the faculty on which he learns it does not satisfy.

**Symptoms of emotional burnout** are feeling of constant fatigue not only in the evening, but also in the morning, right after sleep, feeling of emotional and physical exhaustion, reduction of susceptibility and reactivity due to changes in the environment, general asthenization, frequent, unreasonable headache, full or partial insomnia, constant inhibited, sluggish state and desire to sleep throughout the day, indifference, boredom, passivity and depression, increased irritability to minor, minor events, frequent nervous breakdowns, constant experience of negative emotions, for which there are no reasons in the external situation, a feeling of unconscious anxiety and increased anxiety, a sense of hyper responsibility, the feeling that learning is getting harder and harder, feelings of fatigue, despair, that things will improve, decrease enthusiasm in relation to education, indifference to its results, "loosening" on small details alcohol abuse, a sharp increase of smoked cigarettes a day.

I interviewed 40 students of the second course. The results of the research indicate that students with a syndrome of emotional burnout are absent. But 3 students from the interviewed have 10 symptoms of emotional burnout. The 20 students have an emotional state that is excellent. All other respondents have about 4-7 symptoms, which is normal for ordinary people. From this we can conclude that the general emotional state of the students of the second course of the medical faculty is in good condition.

## **THE AFFECT OF CHRONIC STRESS TO MEDICAL STUDENTS**

*A. D. Klochko, Sumy State University, group MTS - 701  
N. M. Usenko – E L Adviser*

Nowadays medical students of 1-3 courses study both general and special disciplines. Each student needs to deal with huge volume of material. Studying with no relax is a huge stress.

Overload might lead to chronic stress, which can cause depression. Chronic stress can lead to a decrease in brain mass, change in its structure, or affect its function at the molecular level.

Glands – special body cells that product biological active substances into blood (endocrine glands) or on the surface of skin or cavity (exocrine glands). The main gland of human body is pituitary gland. Its physiologic connection with hypothalamus is called the hypothalamic-pituitary system.

Because of stress activates the hypothalamic-pituitary system which releases excessive amounts of adrenaline by suprarenals, the hormone-cortisol is released, which is responsible for the instantaneous reaction of the body to stress (the long-term effect of cortisol causes excessive brain loading).

Chronic stress increases the amount of nerve connections in the almond body, which leads to the inability to control your fear; slow down the transfer of impulses in the hippocampus, which complicates the learning process.

The purpose of this work is to find out the reason of chronic stress in medical students.

The indicator to find out the influence of chronic stress to medical student was the amount of time they spend preparing for classes. By interviewing students of 17-19 years, it was found that 63.7 % are students of Medical Institute of SSU. On the question of how much time you spend on studying 45,5% answered 5-8 hours, 9-12 hours (36,4%), 13-20 hours (18,2%). According to the results 81,8 % of students feel depressed.

In conclusion I would like to say that the effective way to reduce stress for students is to take break (15 minutes) after each 1-2 hours of studying, take a day off, to have less general subjects and have more time for studying special disciplines.

## MEDICAL EDUCATION IN TURKEY

*M. E. Kursat – Sumy State University, group MTSm – 836*

*N. O. Symonenko – E.L. Adviser*

Albert Einstein said “Education is what remains after one has forgotten what one has learned in school.” Julian Tudor Hart believed “My medicine education began three times. What I learned at school didn’t work in the hospital, what I learned in the hospital did not work in family medicine”.

Nowadays the needs of the society in medicine care increase sharply all over the world, that's why more and more medical schools and universities appear in globalized world. Despite the fact that a large number of medical faculties have been opened in Turkey for the last few decades, faculties that were established before the 21th century have much better equipment and facilities and provide advanced medical education in comparison with the majority of medical faculties established later.

There are two main models of medical education in Turkey – "Community Based Education" and "Competency-Based Education". But the problem is that some teachers do not care about practice or even theory; sometimes they “overdose” students with unnecessary information. It is not easy to get medical education in my country. TUS is a special exam for medical students who want to have an expertise; it is really difficult and rather challenging for students.

Today, many medical schools don't encourage students to search and gain information from books. Students are limited to the knowledge taught at schools. And even if a student works hard, he won't learn much only during the lesson seeing a tiny piece of information on the slide. To tell the truth we can observe a great progress of technological and scientific medicine in Turkey but something is always missing.

Medical education, which immersed itself in the development process, forgot about student's development, it cannot find a proper educational method for students and even when they do it doesn't require students’ demands. To my mind if it follows the traditions of classical methodology, a great number of physicians will grow up.

## CREATING AN ARTIFICIAL EMBRYO FROM STEM CELLS

*A.Maliuk – Sumy State University, group IN-82*

*I.A.Morozova – E.L. Adviser*

The problem of human infertility, development and diseases of the embryo has arisen not only at the present time. As soon as people began to study in depth the structure of the human body and the influence of hereditary diseases and other factors on it, scientists began to believe that this could be due to the disruption of a growing organism in the first stages of life, so the question arose of creating artificially grown cells in the laboratory.

Experiments with a human embryo are strictly regulated by law, so British scientists began research on animals and the creation of the world's first artificial embryo from the stem cells of their body. Stem cells are immature cells that can turn into cells of different types, forming various organs and tissues in the early stages of life.

An artificial mouse embryo was soon created on the basis of two types of stem cells: embryonic and extraembryonic trophoblast, which was attached to the wall of the uterus of a live mouse and grew there for several days. But scientists believe that such an embryo will not be able to fully develop due to the absence of a third type of stem cell that provides nutrition to the embryo.

So far, this research is at the very initial stage due to rather limited technical capabilities and access to the necessary resources, but if scientists can make it so that different stem cells begin to interact at the same high level as in natural conditions, the embryo can remain much longer viable.

Science does not stand still! In a short time, by studying the first stages of the development of life, mankind will be able to determine the mechanism of spontaneous abortion and learn how to edit genes and prevent hereditary diseases.

Thanks to stem cells and this scientific study, humanity in the future will be able to prevent not only the above-mentioned diseases, but will also begin to create and grow in laboratory conditions various organs for transplantation. People will not need to search for donors or surrogate mothers, and from their own cells they will be able to create full-fledged organs or embryos in the laboratory, which will make life easier and safer.

## TOP MOST DANGEROUS VIRUSES IN THE WORLD

*N.V. Mashurova - Sumy State University, MC.m-806*

*V.S. Kurochkina – EL Advisor*

Viruses are microscopic parasites, generally much smaller than bacteria. They lack the capacity to thrive and reproduce outside of a host body. Viruses can infect all types of life forms, from animals and plants to microorganisms, including bacteria and archaea. Let us consider ten the most dangerous viral infections.

10. Hantaviruses. There are many strains of hantavirus floating around in the wake of rodents that carry the virus. Different strains, carried by different rodent species, are known to cause different types of illnesses in humans, most notably hemorrhagic fever with renal syndrome.

9. Flu virus. Influenza is an infectious disease caused by an influenza virus. Symptoms can be mild to severe. Usually, the virus is spread through the air from coughs or sneezes. Pathogenesis: usually the first symptoms are chills and body aches, but fever is also common early in the infection, with body temperatures ranging from 38 to 39C.

8. Marburg virus. Marburg virus causes Marburg virus disease in humans and nonhuman primates, a form of viral hemorrhagic fever. The virus is considered to be extremely dangerous. Pathogenesis: the disease can cause bleeding, fever and other symptoms much like Ebola.

7. Rotavirus. This easily spread virus causes inflammation in the stomach and intestines. From late winter to early spring, it can cause severe diarrhea, vomiting, fever, abdominal pain, and dehydration in infants, young children, and some adults.

6. Ebola virus. Ebola virus is a viral hemorrhagic fever of humans and other primates caused by Ebola viruses. The virus spreads through direct contact with body fluids, such as blood from infected humans or other animals. Pathogenesis: symptoms usually begin with a sudden influenza-like stage characterized by feeling tired, fever, weakness, decreased appetite, muscular pain, joint pain, headache, and sore throat. Death, if it occurs, follows typically 6 to 16 days from first symptoms and is often due to low blood pressure

from fluid loss.

5. Dengue virus. Dengue fever is a mosquito-borne tropical disease caused by the dengue virus. Pathogenesis: typically, people infected with dengue virus are asymptomatic (80%) or have only mild symptoms such as an uncomplicated fever.

4. Smallpox virus. The virus that causes smallpox wiped out hundreds of millions of people worldwide over thousands of years. Pathogenesis: the incubation period between contraction and the first obvious symptoms of the disease is around 12 days.

3. Rabies virus. It is a neurotropic virus that causes rabies in humans and animals. Rabies transmission can occur through the saliva of animals and less commonly through contact with human saliva. Pathogenesis: the first symptoms of rabies may be very similar to those of the flu including general weakness or discomfort, fever, or headache. As the disease progresses, the person may experience delirium, abnormal behavior, hallucinations, and insomnia.

2. Lassa virus. Lassa fever is a type of viral hemorrhagic fever. The disease is usually initially spread to people via contact with the urine or feces of an infected multimammate rat. Pathogenesis: in 80% of cases, the disease is asymptomatic, but in the remaining 20%, it takes a complicated course. Nonspecific symptoms include fever, facial swelling, and muscle fatigue, as well as conjunctivitis and mucosal bleeding.

1. Human Immunodeficiency Viruses (HIV). The human immunodeficiency viruses (HIV) are two species of *Lentivirus* (a subgroup of retrovirus) that causes HIV infection and over time acquired immunodeficiency syndrome (AIDS). Pathogenesis: primary infection (Acute HIV): fever, headache, muscle aches and joint pain. Symptomatic HIV infection: fever, fatigue, swollen lymph nodes — often one of the first signs of HIV infection, diarrhea, weight loss. Progression to aids: recurring fever, chronic diarrhea, persistent white spots or unusual lesions on your tongue or in your mouth, weight loss.

In conclusion, I would like to advise everybody to be careful. Try to protect yourselves from infectious diseases.



# **HYBRID CLOSED-LOOP INSULIN DELIVERY SYSTEM IS TECHNOLOGICAL ADVANCEMENT IN MEDICINE**

*V.R. Mordan – Sumy State University, group MTSm – 807  
O.I. Nefedchenko – E L Adviser*

Unfortunately, diabetics have to prick their finger several times in a day to check glucose levels of blood. This procedure is painful. A hybrid closed-loop insulin delivery system is the technological advancement for solving this problem.

The Mini Med TM 670G (the first and only system for automating and personalizing continuous delivery of basal insulin for 24 hours) was awarded the CE label. CE mark (Conformité Européenne) is a special mark covered by the relevant document certifying that it complies with the requirements of the EU directive and harmonized European unions.

The manufacturer notes that the Mini Ged TM 670G system implements an advanced technology Smart Guard TM. It allows not only to prevent episodes of hypoglycemia, but also increases the percentage of time during which the glucose level of a person with type 11 diabetes is in the optimal range (3.9-10 mmol / l). By the way, this is one of the most important indicators of the effectiveness of diabetes management, which reduces the risk of diabetic complications in both the short and long term. Smart Guard TM technology (in combination with the most accurate sensor for continuous glucose monitoring Guardian TM Sensor 3) allows you to automatically suspend and resume insulin delivery by correcting the delivery of basal insulin every 5 minutes based on regularly measured blood glucose values. This improved insulin delivery system allows you to achieve the best treatment results.

Smart Guard TM technology is the only intelligent algorithm capable of adapting to fluctuations in blood glucose levels and automatically adjusting the concentration of basal insulin to ensure glycemic control. This advanced algorithm mimics some of the functions of a healthy pancreas and is the only technology in the world that increases the percentage of time during which the blood glucose level is in the optimal range.

## THE BENEFITS OF VACCINATION

*Rymma Ptakhina, Anastasiia Dudka, Pdm – 701  
PhD, Kozachenko Yu. S.*

Today many moms refuse vaccinations, because a lot of false information is on the Internet. But let's see? What is vaccination? This is the administration of a vaccine to help the immune system develop the protection from a disease. Vaccine is a biological preparation with antigens that provides active acquired immunity to a particular disease.

The most likely reason for the overall reduction in child mortality is the increased immunization against major childhood diseases.

Vaccination rules are:

1. Vaccinations to make on the vaccine calendar.
2. There are any visible signs of damage to the vial or ampoule.
3. The expiration date of the vaccine.
4. If the number of section is suitable.
5. Whether the contents of the vial is contaminated, the presence of suspected pollution of floating particles, discoloration, turbidity.

Remember, your kids must be healthy during vaccination, they can't eat food that can cause allergies. After the injection of the vaccine you have to observe the child for 30 minutes. Monitoring of the child's condition are temperature, color skin, swelling and redness in the injection.

We think that benefits of vaccination are more than disadvantages. If your children attend kindergarten, imagine how many viruses they can catch. It is one of the way how we can minimize a lot of epidemic. If we want our children to be active, energetic and healthy, we have to think about this way of decision. A lot of people are afraid of some procedures or quantity of vaccination. Obviously, you must be sure what the origin of the vaccination is. You also have to be responsible for health condition of your child. As you see there are more advantages than disadvantages.

## **EFFECT OF STEM CELLS ON THE TREATMENT OF PARKINSON'S DISEASE**

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*M.M. Dunaeva, Senior Lecturer*

Parkinson's disease is a slowly progressive chronic neurological disease, which is a degenerative disease of the extrapyramidal motor system. This is a weakness in which neurons are gradually destroyed, producing one of the most important neurotransmitters – dopamine, acetylcholine neurotransmitter antagonist.

This disorder is not treated, but since science does not stand still, many try to stop it with the help of various methods. One of the techniques is the use of stem cells.

Stem cells are the main «building» material for the structure of all tissues and organs. The effect of cells on the human body is not well understood but scientists from Kyoto and Belarus have proven that they inhibit the occurrence of disease. Material transplantation was first used on animals, namely in rats and primates. The cells penetrated into the nervous system, were built in, had a neuroprotective and immunomodulatory effect and improved the condition of animals, which was modeled Parkinson's disease. As a result, indicators of motor functions in animals improved. After that, no side effects have been reported.

The next achievement is that the stem cells also used on man. Neurons are inserted into the patient's brain, artificial cells of which are obtained from human skin cells. After this experiment also did not show any side effects. Scientists hope that the transplanted cells will take the place of the dead and begin to produce dopamine. The advantage of stem cells is that they can be produced in a large enough volume. If successful, it will continue to carry out operations for the treatment of Parkinson's disease.

We can only hope that this technique can be applied in the treatment of this disease since there will be a way to treat one of the most common illness.

# **DIAGNOSTIC METHODS OF CANCER AND THE WAYS OF ITS TREATMENT**

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*V.S. Kurochkina – EL Advisor*

There is no single test that can accurately diagnose cancer. Effective diagnostic testing is used to confirm or eliminate the presence of disease, monitor the disease process, and to choose the effective treatment. In some cases, it is necessary to repeat testing when a person's condition has changed, if a sample collected was not of good quality, or an abnormal test result needs to be confirmed. Diagnostic procedures for cancer may include: lab tests; diagnostic imaging; endoscopic exams; genetic tests; tumor biopsies.

There are many types of cancer treatment. The types of treatment will depend on the type of cancer and how advanced it is. Some people with cancer will have only one treatment. But most people have a combination of treatments such as surgery with chemotherapy or radiation therapy. You may also have immunotherapy, targeted therapy, or hormone therapy. When you need treatment for cancer, you have a lot to learn and think about.

Scientists at the British Cancer Research Institute have developed a revolutionary drug that has just undergone clinical trials and is recognized as effective in combating six types of tumors. Innovative therapy works on the principle of "Trojan horse": developers have "hidden" drugs by camouflaging toxic molecules under the guise of harmless antibody. Thus, it directly enters the tumor and destroys it from the inside. Tests were conducted on patients with the most common and aggressive forms of cancer already at a late stage - after they were not helped by other types of treatment. The best results were shown in the fight against cancer of the cervix and bladder. In addition, therapy has proven effective in treating cancer of the lung, esophagus, uterus, and ovaries. The drug is administered intravenously. It is a hybrid of chemistry and immunotherapy.

In conclusion I would like to say that cancer is one of the biggest problems in the field of modern medicine. I really hope that one day we will find a way to solve this problem.

### 3D ORGANS' PRINTING

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N.V.Maliovana – Ph.D., E.L.Adviser*

The evolutionary idea of 3D printer appeared in early 70s of the twentieth century. The majority of people think 3D printer can be used only for engineering purpose. However 3D printer became a helpful hand in a medical field. The problem of damaged or missing organs can be easily solved by using a bioprinter. This tool will reduce the time of finding the right organ and as a result it can save somebody's life.

There are 3 types of 3D printer : an inkjet, a microextrusion and a laser.

**Inkjet.** The first devices for bioprinting were inkjets. They store a biological material in cartridges, which are sprayed onto a hydrogel backing sheet. Disadvantages - an inaccurate droplet ejection and clogging of the spray nozzle with the possible death of a cellular material. Advantages - a low cost and mass reproducibility.

**Microextrusion.** This method is used in inorganic 3D printing. Disadvantages - the denser the cells fit, the less they survive. Advantages - suitable for 3D printing of high-density organs, fine-tuning of the material supply due to pressure regulation.

**Laser.** It is common in industry, but used in bioprinting. Disadvantages - the increased metal content in the cells from the evaporation of the reflecting element. Advantages - controlled up to individual cells, laying biomaterial.

3D organs have already been tested on animals. The group of scientists presented artificial ovaries to sterilized mice and gave a birth to healthy mice. Printed organs are much better than transplanted parts of a body, due to the fact that they aren't rejected by the human's immune system, as they are taken from the patient's DNA. Nowadays a bioprinter successfully creates plenty of organs, such as internal tissue, skin.

Many patients have recovered because of this technology. For example, a 83-year-old woman from Belgium struck osteomyelitis. Her restoration cost a lot and would last longer than removing a diseased jaw and implanting a printed new one. The woman recovered quickly enough and now she has no health problem.

Doctors strongly believe, that the development of bioprinting will replace a scalpel and it will be possible to treat incurable diseases.

# **TUBERCULOSIS IS A TERRIBLE EPIDEMIC FOR SOCIETY**

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Tuberculosis is an infectious disease caused by Koch's wand, which most often affects the lungs. This disease is the second largest cause of death in the world.

Apart from lungs, tuberculosis (TB) can affect the other parts of the body as well. In this case, the symptoms will depend on the part that it affects. Symptoms of tuberculosis include:

- loss of appetite and weight loss;
- chills, fever;
- increased perspiration;
- coughing;
- pain in the chest area.

A more common diagnostic test for tuberculosis is a skin test, in which a small injection of the TB bacteria extract is done just below the inside of the forearm. Also for the diagnosis, you can take blood samples and conduct an x-ray examination. Along with a skin test, sputum examination can be used to check for the presence of tuberculosis bacteria.

In most cases, tuberculosis can be cured when the right medicine is available and correctly administered. The exact type and duration of antibiotic treatment depend on the person's age and general health. It is important that any treatment should be fully completed even if the symptoms of tuberculosis have disappeared. Any bacterium that has not been eliminated in the course of treatment can again trigger tuberculosis.

Tuberculosis is contagious, but it is not so easy to catch. The chances of being infected with tuberculosis for a person who lives or works with you are much higher than for a stranger. Most people with active tuberculosis who have received appropriate treatment for at least 2 weeks can no longer infect you.

It is better to be careful with the disease and take preventive measures than to treat it later.

## **HOW EMOTIONS INFLUENCE ON OUR ORGANISM**

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*M.M. Dunaeva, Senior Lecturer*

Emotions plays important role in our life, because of them we can react positive or negative on some circumstances, we can feel something to other persons, we can solve the problem by the relying on emotions. We can fill this list all day.

Our emotions can be causes of many diseases. For example: Sadness can stimulate the production of Cortisol, which can low our level of glucose in blood. Due to our habits, it can cause anorexia or obesity. Also, it may cause negative influence on blood system, what can lead to high blood pressure or infarct.

Goal of my research is to analyze, what biochemical and biophysics changes happens in our body and how it actually effect on it? With what kind of disease we can face due to some emotions? How our emotions can serve us as a treatment to some disease?

Importance of this research is to show how influence of emotions change our biochemical and biophysical indicators of our organism.

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## **SECTION 4 SOCIAL, PEDAGOGICAL AND LINGUISTIC SCIENCES**

### **INTERCONNECTION BETWEEN THE STRATEGIES OF CONFLICT BEHAVIOR AND THE MECHANISMS OF PSYCHOLOGICAL DEFENSE**

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Mental constancy of an individual requires serious internal effort. Under the influence of irritating factors, the mechanisms of mental defense of a personality become actual.

For the first time, the concept of «defense» was used by Z. Freud in 1894 in his work «Protective Neuropsychosis». Initially, the scientist believed that the mechanisms of psychological defense are congenital, triggered in an extreme situation and act as a means of overcoming the conflict between consciousness and unconsciousness.

We studied the connection between the mechanisms of psychological defense and the strategies of behavior in the student conflict. The psychological diagnostics of 70 people studying at Sumy State University at different faculties and years was conducted for the practical research of the given theme. The study covered students aged from 17 to 21 years old (including 17 and 21). To do this, we used a questionnaire on the definition of LSI defense mechanisms by R. Plutchik and Thomas-Kilman test questionnaire «Strategies of Behavior in Conflict Situations».

Traditionally, conflictologists distinguish five main strategies of behavior in conflict situations. These strategies vary depending on the orientation of the participants of the conflict to realize their own goals or the partner's goals. The course and the final result of the conflict often depends on the strategy chosen by the participants. The conflict requires a lot of emotional effort and can be regarded as the one that can threaten mental health and trigger the work of defense mechanisms.



The analysis of our empirical research confirms the interconnection between the strategies of conflict behavior and the mechanisms of psychological defense of an individual. The strategy of competition correlates with compensation, avoidance has a positive relationship with displacement and evasion. In the boys group, a correlation was found between competition and compromise, as well as between adaptation and reactive formations. The dispersion analysis confirms the relationship between the mechanisms of psychological defense of individuals and strategies of behavior in conflict situations.

### **TECHNOLOGY OF MNEMONICS AS A METHOD OF MEMORY TRAINING IN YOUNG CHILDREN**

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Nowadays Ukraine is undergoing socio-economic changes that have necessitated the humanization of the education system and the emergence of innovative processes in education: there is a reform of the education system, in particular, there are new types of schools, updated the content of education, developed new technologies of education and upbringing of primary school children. Adopted a number of documents, the introduction of the educational process which aims to provide each student the conditions for development as a subject of learning.

The practicing teachers point out that in the modern school often have difficulty remembering and reproduction of information, and thus arises the problem of a conflict between an imperfect method of forming processes of remembering.

Modern science offers techniques to improve memory, which are based on the principles of memorization, storage and reproduction of information. For example, "renewal", "regression", "consistent Association", "dynamic compliance" and "mnemonics".

Among the proposed methods, considerable attention, in our opinion, should be paid to mnemonics.

Doctor of pedagogy, psychologist, founder of the center for educational technologies, "A School of Audiotechniques " - G.A. Chepurnoy carries out the study of mnemonics as technologies for the efficient assimilation of information in conditions of modern Ukrainian education. As it is stated in his teaching manual "Mnemonics: the technology of effective assimilation of information in modern education" "Mnemonics-a technology to improve the assimilation of new information through the conscious formation of associative links with the help of special methods and techniques." [3, c.3-4].

The actual problem of psychological and pedagogical science are the methods of effective assimilation of various information. Because the constant increase in the volume of educational information in modern schools leads to a number of mental health problems of students. Because of this, it is necessary to replace such a model of education, in which the teacher, in the reproductive and reproductive form, transmits knowledge to students, a model where the teacher cooperates with the student in a productive and interactive form, and the student is an active participant in the educational process, and not a passive object of learning.

One of the important principles of modern education is the optimization of learning through the use of the latest educational psychological and pedagogical technologies and, in particular, mnemonics, as one of the most effective methods of assimilation of information and information saturation. Mnemonics refers to health-saving technology that provides optimization of mental activity in modern education [1].

Mnemonics (from Greek-memory and art) is a way to improve new information by forming associative links with the help of special methods and techniques.

Modern encyclopedic dictionary gives the following definitions of mnemonics:

--the art of memorization, a system of different techniques that facilitate memorization and increase the amount of memory through the formation of additional associations;

- an internal writing system that allows you to consistently record information into the brain, converted into a combination of visual images [2, c.796].

Mnemotechniques are used to improve the assimilation of complex information that has no established logical connections between its elements from the point of view of the person who remembers it, and requires long-term storage and subsequent playback, for example: a sequence of numbers, phone numbers, historical dates, formulas.

The use of mnemonics improves the volume and accuracy of memorization and development of cognitive processes, increases the storage time and quality of reproduction of the acquired information.

It is especially important to teach the rational use of the memory of future pupils.

Younger students have a well-developed involuntary memory that captures bright, emotionally rich information for the child and the events of his life. Memory is characterized by a high degree of mechanical memorization based on numerous repetitions. However, his self-control is not yet formed-well, quickly and for a long time assimilated that made a strong impression.

Mnemonics helps to solve the following main educational tasks:

- to expand the creative possibilities of the child, thanks to the harmonious work of the left (logic) and right (creativity, creative thinking) hemisphere of the brain;

- to form the ability to effectively and independently learning;

- to increase self-esteem of the child due to the effectiveness in learning;

- to reduce stress from learning;

- to increase training motivation;

- to have free time from memorization for a productive and creative work;

- to develop an imaginative memory that helps perceive the world in all its glory;
- to increase an adaptation of the child in our society (becomes more independent in an intellectual and practical work).

All in all, mnemonics forms skills for effective assimilation of complex information, forms confidence in yourself and your own capabilities. Therefore, we believe that it should take its place in the modern educational system and make the educational process of great quality and accessible to all children and adults. Harmonious cooperation of Ukrainian pedagogy, psychology and new educational technologies of both European and domestic development will form a new creative approach to learning and allow everyone to gain new knowledge comfortably, easily and with great pleasure.

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## **MAJOR BRANDS CAMPAIGN VS OCEAN TRASH**

*D. Kholin – Sumy State University, group JT – 62*

*T. V. Pochatko – English language adviser*

How do we imagine advertising nowadays? We can see the annoying adverts that are everywhere. It's absurdly to deny, that the advertisements took a great influence on each person and is leaking out to our brain, even if we don't want this. To be truthful nine times of ten the adverts make us highly dissatisfied. Why is it so? To make an advert that causes emotions is an art. Fortunately, there are the advertisements in modern world, that help us to generate different emotions and draw attention to important questions, that should be discussed for sure. For me, it gives the expectations, that in future the ads will be pleasant for the user.

One of the campaign, that draw our attention to the problem of plastic pollution was made by Greenpeace Canada. Out of eight million tons of plastic trash that stream every year into the world's oceans, the plastic drinking straw is not a top contributor to all that capacity. Yet this small, slim tube, absolutely unnecessary for most beverage consumption, is at the center of a growing environmental campaign aimed at convincing people to stop using straws to save the oceans. Small and lightweight, straws often never make it into recycling bins, the evidence of this is visible on any beach. And although straws amount to a small part of ocean trash they entangle marine animals and are consumed by fish. Video of scientists removing a straw embedded in a sea turtle's nose went popular in 2015. [2]

The aim of the campaign is to force businesses large and small to rethink their plastic usage overall. All throwaway plastic, like lids, cups, containers, and packaging, is fueling the plastic pollution crisis. It's necessary for the companies to reduce their massive plastic imprint on our blue planet and communities. [3]

The debate over the destructive role of single-use plastics on ocean life reached critical mass this year, with major brands including Starbucks pledging to phase out plastic straws. Perhaps the most powerful visual to make the case for this consumer shift came from Greenpeace Canada and agency Rethink, whose ads feel like a punch in the throat to each viewer: “Don’t suck life from our oceans”. It’s a powerful, unforgettable image — and one that unfortunately isn’t hyperbole. [1]

Due to this campaign people started to think about the problem of plastic pollution, especially about the straws that we often use and which can cause many troubles for our planet. Such ad campaign helps us to make our world better. Despite the annoying ads everywhere some of them extremely important in our life. So if the ads don’t have only commercial purpose but a social one, that will be much better.

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## **THE PSYCHOLOGICAL IMPACT OF ADVERTISING ON HUMAN CONSCIOUSNESS**

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*PhD Kozachenko Yu. S.*

Advertising is firmly established in the life of modern society. Its penetration into various spheres of human activity becomes more and more obvious. But in the modern world advertising has long ceased to be just a source of information about goods and services. Modern scholars view advertising as a definite psychological technology, focused on manipulating the motivational-need and conscious spheres of the individual to achieve socio-political, economic and other preferences, and argue that advertising is a powerful means of influencing and manipulating a person and as a phenomenon capable of shaping and changing the worldview and behavior of people. That is why specialists from different fields are now studying this phenomenon so thoroughly.

According to American sociologists, the impact of advertising in the world annually crazy 2783 people. People are not aware of the dangers, and continue to watch "fun advertising". A few years ago, a couple of commercials and clips on the TV screen did not look like any threat. But for today, when 18 % Airtime was "stuffed" with advertising, this topic was sharply among sociologists and psychologists.

Advertising is any paid form of non-personal offer of goods and services on behalf of a designated sponsor, in order to influence in a certain way the audience. With the help of advertising formed a certain representation of the buyer about the features of the product or service. People all over the world pay attention to advertising. We are interested in new products, services and technologies. Advertisement can catch our attention.

The Law of Ukraine "On Advertising" defines that advertising is a special information about individuals or products distributed in any form and in any way for the purpose of direct or indirect gaining profit [1, 2].

The purpose of advertising - to attract attention, to cause interest, to convey information to the consumer and to force him to

act in a certain way. It's not enough to make a product, it's important that he find his consumer. Therefore, an advertisement must inform somewhat important and interesting to the consumer, something exceptional, special, which is not in other products.

The controversy is that, as before, that thing is undoubtedly useful in the activities of the advertiser, but at the same time they can have a detrimental effect on the health and psyche of people, and the development of advertising can radically change social relations in society.

Advertising as a market tool and a social institution, of course, affects a person as a participant in market relations - the consumer. That is why it should carry different aspects of information, in a complex affecting the feelings and thoughts of the person, based on his social and physiological experience. Advertising should be honest, high-quality, creative and geared towards different segments of the market.

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#### MOTIVES FOR POLITICAL PARTICIPATION

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Citizens' participation in the political processes is one of the indicators of the quality of the political system, level of democracy and openness, creation of conditions with equal opportunities.

The political participation is characterized by the variety that causes various classifications of its forms. The forms of political participation differ in both the degree of understanding and scaling, legality and other parameters. The most common types of political participation include:



- electoral behavior;
- activities, which are aimed at supporting candidates and parties in election campaigns;
- professional political activity both public politicians and people, who provide professional implementation of political and state functions;
- attending rallies, political meetings, and participating in demonstrations;
- participation in the activities of parties, political movements and interest groups.

The psychological reasons for participation of citizens in political life include:

1. Satisfying their own interests.
2. Realization of positions, ideals, values.
3. Ability to control the current course of events, a sense of importance.
4. Satisfying the needs of communication.
5. Compensation for personal failures and drawbacks.

From the psychological characteristics and reasons for political participation we will try to find out the motives. The motives of political participation we include increasing interest in politics, aimed at the cognition of the life of political society, career, own realization of the individual as a person, aspiration to social unity.

D. Olshansky outlines such basic, in his opinion, groups of motives for political participation:

- 1) the motive of interest in politics and its attractiveness as in a sphere of professional activity;
- 2) cognitive motives;
- 3) the motives of power over people;
- 4) ideological motives;
- 5) perfectionist motives that imply «making a difference»;
- 6) traditional motives (a person behaves in a certain way, because it is common for this area, among relatives, friends, acquaintances);
- 7) profitable motives;

8) so called fake motives formed under the influence of propaganda, which may not be even realized by a person [2, p. 254]. However, there are serious doubts about the completeness, and most importantly, the specificity of these groups. Moreover, the information about their empirical probability is not provided.

The attempt of D. Goncharov to regard motivation of political participation only in the field of instrumental relations does not seem quite convincing. In this field the process of communication itself does not have any value to people [1, 10]. This attempt, in fact, extrapolates the rational behavioral model in the elections (in its simplest variant) on political participation in general.

In the opinion of the humanistic direction of political psychology, the most important motive of participation in politics is not a banal benefit or political transactions. In this case, the results of our empirical research prove that when for professional politicians (political leaders) the most important are the motives of power, control and achievements, for the participants of the political process involved on the non governmental basis, the most important are the motives related to personal development and affiliation.

The level of control over social subjects, organization and expediency of political actions and the ability of different social groups to coexist determine high political culture of citizen participation. Every day worries, poverty, low political culture of authorities and no hopes for the citizens to change life for the better, on the contrary, determine a certain political passivity, political non-participation.

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## **TIME MANAGEMENT**

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Nowadays time management plays a great role in our lives. Managing your time successfully implies making what is most important for you and your future life.

Good time management has a big affect on student learning achievements. Planning time can help to cope with study stress and organize time in a proper way.

You are probably asking yourself why anyone should engage activities that are neither important nor urgent, but you would be amazed to find out just how much of your time is really wasted.

There is a useful strategy about time perspective. It consists of activities in terms of importance and urgency. Doing things that are neither important nor urgent does not make sense.

Time is highly elastic. We cannot make more time, but time will stretch to accommodate what we choose to put into it. Every person has 24 hours, 1440 minutes and 86 400 seconds a day. If you want to make your life easier, you can try to write a to-do list, often try to say «No» for not important activities and study difficult subjects first as they require the most creative energy.

You multiply your time by giving yourself the emotional permission to spend time on things today that give too much time tomorrow.

Therefore, time management makes our life easier and avoids procrastination. A person should be able to identify important and urgent tasks, important but not urgent, not important and not urgent, urgent but not important.

In conclusion, it should be noted that scientists are still studying the problem of the time-management, but little is learned how to avoid the emotional impact on time management.

## INNOVATION IN ADVERTISING OF WORLDWIDE BRANDS

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We live in a world of advertising. Nowadays we are surrounded by advertising. So, we open the pages of our favorite magazine, and there is a glossy advertisement for clothes, shoes, cars or beer. We turn on the TV, and smiling faces on the screen are trying to offer us soap, toothpaste, candy, and even politicians. Advertisements are an insidious form of brainwashing. Advertising has become such an annoying violator that it has become enough for companies to not only create advertising that conveys the brand's message, but also advertising that consumers would like to spend time with. In an era when advertising becomes a brutal victim of the "Skip" button, when consumers get annoyed because of 5-second advertising on YouTube, creativity has become an indispensable feed of the elevator pitch.

*Ikea* is a world renowned furnishing and home accessory brand operating in many countries around the globe. *Ikea*, with its wide range of furnishing and home décor products, promises their consumers to sleep at peace every night. But while advertising, they took an unexplored and rather unique approach. *Ikea's* marketing agency created the 'Sleepiest Print Ad' featured on the back of *Good* magazine published in United Arab Emirates. The advertisement promises that everything about it is designed to ensure that their consumers sleep better. The first engaging factor of the advertisement was the aroma coming from lavender ink which was used to print the advertisement. Lavender ink is known to create calming effect by relaxing muscles, slowing heart beat and leading to improved sleep quality. But the ad doesn't stop its innovation right there. According to the copy, after detaching the ad from the magazine and removing some tabs the whole thing can be plugged in an USB and charged to be used as a white noise speaker [1].

*P&G's* 'Thank you, Mom' was a campaign which might not have a very innovative strategy but the creativity and emotional

attainment of this campaign was vast. The biggest strength and the common denominator of a brand that hosts range of products from pampers to Olay skin care is their vast consumer base who are mostly mothers. Mother is that constant figure in all of our lives who cares and empowers. From birth, no matter what age we are at, every time we fall, our mothers are always there to pick us up mentally, morally and physically. During 2012 London Olympics, P&G leveraged these emotions to show how mothers were that epitome of power that picked up the athletes every time they would fall or fail, and thanked every mother for their contribution. The global efforts behind 'Thank you Mom' had a staggering \$500 million incremental impact on P&G's sales. There was no product placement in the advertisement, despite so during the end of Olympics P&G saw a rise of .1% sales vs. a .2% increase in sales for their entire industry[1].

*Tinder* is a world famous application that helps eligible bachelors to meet someone they would be interested to date. In order to promote this popular dating application Tinder, in partnership with Tinder agency Delta created a dating wall in Brooklyn. While designing the wall Delta had put scenes from nine exotic destinations for New York singles to take selfies and put up in their dating profiles. The wanted to give their targeted audience a chance to look like attractive jet-setters, to help them meet their perfect match. It is a perfect example of fun, interactive and innovative strategy[1].

The aim of a good advertisement is to create a consumer demand to buy the advertised product or service. If we don't pay attention to the ads, then they won't have that much of an affect on us. Sure, the makers of commercials can try to jack up the volume, but at least we have the right to look away.

Electronic resource: 1. <http://bbf.digital/innovation-in-advertising>

# **RECREATION ACTIVITIES OF THE ELDERLY AND POSITIVE EFFECT OF BADMINTON ON THEIR ORGANISM**

*A. E. Siryk, a senior teacher of physical training department  
O. R. Gladchenko, a senior teacher of foreign languages department*

Introduction. In modern conditions there is a tendency to reduce life expectancy and activity of people of middle age and the elderly. The slowdown of involution processes is one of the tasks of physical recreation. The individuals who are regularly engaged in physical exercise for a long time can maintain good health and high performance. Age changes in them proceed much slower. Recreational activities are of paramount importance in the struggle for improving health, increasing of working capacity and extending of human life.

Purpose: to determine theoretical and methodological principles of recreational activities of the elderly and the influence of badminton as means of motor recreation on their organism, based on the analysis of literature and practical experience.

Presentation of the research material. The research of scientists and practitioners dealing with motor recreation problems is presented by the works of such scientists as O. Andreeva (2015), A. Hackman (2017), T. Krusevich (2011). They confirm the positive effect of physical activity on the regression of human body functions. This effect is differentiated depending on the type of motor activity. Finland experience shows that 70% of the country's population are engaged in recreational sports and physical education, and 50% of Finlanders walk or ride a bike to work. At the moment, Finland takes the first place among all European countries in turns of life expectancy. According to various data, only 3.6% of the Ukrainian population are engaged in recreational sports and physical education.

The authors of this study propose badminton as means of motor activity for the staff and teachers of our university. Badminton is a fully accessible sport and the effective means of physical development. Badminton trainings require manifestations of special physical and psychological qualities: endurance, agility and coordination, operational and analytical thinking, creativity, sustainability of attention, reaction speed. Under the influence of training loads musculoskeletal apparatus strengthens, motor quality develops, accuracy and coordination of movements improve, and as a

consequence, all vital functions are activated in the process of training. In addition, you can confidently state that badminton is the key to solve one of the urgent problems of global health and namely, the progressive deterioration of the quality of vision in people of all ages. It has been established that the use of badminton resources positively affects refraction, accommodation and hemodynamics of human eyes. The observation of the shuttlecock, which approaches at first and then moves away trains eye muscles and visual analyzer, while moderate loads do not allow their fatigue. The training is accompanied by a positive emotional background and psycho-physiological unloading.

First of all recreational activities should be oriented on the activation of the personal activity of the elderly people and on the formation of their vital tone. Based on this approach, the following basic functions of badminton trainings for the elderly can be singled out:

- preservation of health;
- improvement of the psychophysical state;
- strengthening of social activity of the individual.

Conclusions. Recreational activities have a positive impact on human health and help to delay the ageing process. The huge opportunities inherent in the body of each person can be realized in health and active longevity only under the condition of systematic and regulated physical activity.

Prospects for further research will focus on the development and implementation of badminton recreational and health programs for the elderly to improve their health and slow down the aging of the body.

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## **PREVENTION OF PSYCHOLOGICAL VIOLENCE AT SCHOOL**

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Nowadays, cruelty and violence among children is becoming an urgent problem. Children spend a lot of time in educational institutions, so schools should play a basic role in protecting children from violence. The administration of educational institutions and teachers are obliged to create safe conditions that would contribute to the preservation of the dignity of children and their development.

Violence, as is defined by the world health Organization, is the intentional use of physical force or power, actual or threatened, directed against another person, a group of people or community, resulting in body injury, death, psychological injury, developmental disabilities or various kinds of damage.

It is possible to distinguish such types of violence as physical, psychological (emotional, moral), verbal, economic, sexual (including cyberbullying). Also violence can be combined.

Children in schools are most likely to experience psychological violence. Psychological violence is the violence associated with the pressure of one person through intentional verbal abuse or threats, harassment, intimidation, which brings the victim to a state of emotional uncertainty, loss of ability to protect himself and can cause or have caused harm to mental health.

In the school environment, it can be bullying and boycott.

Bullying can be seen as harassment and discrimination. This term means a long process of conscious abuse (physical, psychological, etc.) by a child or a group towards another child or other children.

A boycott is a type of psychological violence in which a person is ignored.

The consequences of psychological violence in the school environment can be significant violations of children mental health.



Such emotional (moral) bullying can be even more offensive than physical.

Researches of United Nations International Children's Emergency Fund showed that in 2017, 67% of children in Ukraine aged 11 to 17 were faced the problem of bullying, 24% of children were victims of bullying, and 48% of them did not tell anyone about these cases. In addition, according to a 2018 UNICEF study, every second student between the age of 13 and 15 was reported to have been abused by peers at schools.

The studies of such scientists as Y. Lysyuk, N. Grishina, N. Zinoviev, N. Mikhailov, D. Olweus and others were devoted to this problem.

Y. Lysyuk noted that violence, as a social phenomenon, is a deliberate act that is carried out by a social group or an individual, which is directly related to the infliction of physical, psychological or material damage to another person.

N. Grishina notes that the victims of violence at school are children who have:

- physical disabilities: wearing glasses, hearing impaired or motor impaired children;
- behavior features: closed or impulsive;
- features appearance: kids with freckles, protruding ears, crooked legs, completeness or on the contrary, thinness, etc;
- children who are afraid of school;
- lack of experience of life in the team (so-called "home" children);
- disease, epilepsy, stuttering, speech disorder, dysgraphia (impaired writing), dyslexia (impaired reading), dyscalculia (impaired ability to the account), etc.;
- low level of intelligence or some learning difficulties;
- gifted children;
- unkempt appearance (dirty clothes, bad smell) ;
- physically weak children, insecure, emotionally based, anxious

Scientists have concluded that:

the most aggressive are adolescents whose behaviour is not monitored, who are left to themselves and receive little attention, and who are severely punished;

- aggression is largely determined by the social environment of a teenager: his family, friends, teachers;

- teenagers learn to behave aggressively, watching the behavior of their peers, the behavior of adults is less significant for them;

- with the most aggressive children, few people communicate in the classroom, so these children are looking for friends among their peers;

- media plays a significant role in the formation of aggression in adolescents;

- aggressive behavior usually accompanies the poor development of social and cognitive skills of a teenager.

Conversation can be used to prevent psychological violence in school environment. Such conversation can be lead by a practical psychologist, social worker or class teacher.

More effective conversation must be conducted by the class teacher, because he affects the judgments of children about each other, forms the public opinion of the team.

The conversation with the class should be open. All parties of the conflict must be present. The role of the class teacher in this case is to organize a normal and, most importantly, quiet communication of students, so during the meeting children should discuss the misbehavior of the individual and analyze the specific actions and decisions of the classmate, who causes their discontent.

Also, it is necessary to conduct training for school psychologists to improve knowledge on this topic. Then they will be able to conduct such classes in their schools to raise awareness of non-violent means of communication. Thus, the level of violence in schools will decrease.

So, to prevent violence in the school environment is to conduct educational training for psychologists and conversations and educational activities for students.

## **PROFESSIONAL BURNOUT**

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Professional burnout is a hot topic in today's workplaces, given its high costs for both employees and organizations. This problem is very important and many well-known psychologists investigate it.

Many people think that they will never run into this problem. But in modern world no one is immune from work-related stress. Empirical findings show that burnout depends on the social environment in which people work. Researchers show that social rewards are very important.

Burnout as a stress phenomenon is a prolonged response to chronic situational stressors at workplace. There are three areas of burnout: emotional exhausting, depersonalization and professional efficacy. It is the everyday stuff when people start to say “I can't do this anymore, I don't want to be here» and so on.

Professions that traditionally have had a higher risk for burnout are health care, human services, social activism. Now burnout is a risk in many other professions, for example, tech industries, customer services.

One must admit that a teacher is very stressful profession. Symptoms of teacher burnout are a lack of time, a lack of interest in teaching, reluctance to try something new, the blaming of students for the lack of success.

One cannot deny that creating a good staff room climate is very useful for teachers. Moreover teachers would stay motivated and positively involved.

Doubtless, the price people are paying to work on their job is very high. It can be emotional or physical exhaustion, sleep deprivation, disruptions, depression and the worst is suicide.

In conclusion one can say that understanding this problem can help to see first signs and prevent them from deepening.

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МАТЕРІАЛИ XIII ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ  
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