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ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ ЦЕНТР

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ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО
ЦЕНТРУ КАФЕДРИ ІНОЗЕМНИХ МОВ**

“TO MAKE THE WORLD SMARTER AND SAFER”

(Суми, 22 березня 2018 року)

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
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FOREIGN LANGUAGES DEPARTMENT
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LANGUAGES DEPARTMENT**

“TO MAKE THE WORLD SMARTER AND SAFER”

(Sumy, March 22, 2018)

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NANOTECHNOLOGY

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Nanotechnology is a broad term that covers many areas of science, research and technology. In its most basic form, it can be described as working with things which are so tiny that they cannot be seen with standard microscopes. The same stuff - building blocks of nature, atoms and molecules - that has always been there, but we just couldn't see it. Nanotechnology involves understanding matter at the "nano" scale.

The purpose of our work is to describe the main ways nanotechnology secures your future.

The paper gives the description of three ways nanotechnology uses for securing our future. The first way is “Doctors inside your body”. Wearable fitness technology means we can monitor our health by strapping gadgets to ourselves. There are even prototype electronic tattoos that can sense our vital signs. But by scaling down this technology, we could go further by implanting or injecting tiny sensors inside our bodies. This would capture much more detailed information with less hassle to the patient, enabling doctors to personalize their treatment. The possibilities are endless, ranging from monitoring inflammation and post-surgery recovery to more exotic applications whereby electronic devices actually interfere with our body’s signals for controlling organ function.

The second way is “Self-healing structures”. If cracks do appear then nanotechnology could play a further role. Changing the structure of materials at the nanoscale can give them some amazing properties – by giving them a texture that repels water, for example. In the future, nanotechnology coatings or additives will even have the potential to allow materials to “heal” when damaged or worn. For example, dispersing nanoparticles throughout a material means that

they can migrate to fill in any cracks that appear. This could produce self-healing materials for everything from aircraft cockpits to microelectronics, preventing small fractures from turning into large, more problematic cracks.

The third way is “Tackling climate change”. The fight against climate change means we need new ways to generate and use electricity, and nanotechnology is already playing an important role. It has helped create batteries that can store more energy for electric cars and has enabled solar panels to convert more sunlight into electricity. The common trick in both applications is to use nanotexturing or nanomaterials (for example nanowires or carbon nanotubes) that turn a flat surface into a three-dimensional one with a much greater surface area. This means that there is more space for the reactions that enable energy storage or generation to take place, so the devices operate more efficiently. In the future, nanotechnology would also enable objects to harvest energy from their environment. New nanomaterials and concepts are currently being developed that show potential for producing energy from movement, light, variations in temperature, glucose and other sources with high conversion efficiency.

So, it’s quite clear, that if we can master these three ways of nanotechnology application, we will have the opportunity to improve not just electronics but all sorts of modern life areas.

THE PROBLEMS OF CONTENT MANAGEMENT SYSTEM

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In our time, more and more web developers use CMS. These systems take most of the development of the web-resource. It makes the work of a web programmer much easier and faster, allowing him to execute more projects in a certain period of time. But in addition to a large number of pluses CMS has some minuses before creating a site from scratch. Sometimes developers forget about the shortcomings of CMS, which leads to sad consequences.

Let's look at some key problems of these systems.

1. The security of sites created with the help of CMS is extremely low.
2. The internal structure of the site is not optimized.
3. Web sites on the CMS are not very popular with search engines.
4. Problems of making changes to the system code.
5. These sites are very similar to each other, which makes them completely unique.
6. Low speed of work of sites.
7. Mastering each CMS takes time.
8. High load on the server.
9. Some CMS are not free.
10. More experienced programmers have a prejudiced attitude to these systems.

Thus, we can conclude that despite the popularity of CMS, the skill of creating sites from scratch is valued much more. Do not forget that programming is a creative work, do not hesitate to add your own lines of code, because originality is appreciated in any field.

CRYSTALLINE STRUCTURE, ELECTROPHYSICAL AND MAGNETORESISTIVE PROPERTIES OF HIGH ENTROPY FILM ALLOYS

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In the last decade is conducted intensive research of crystal structure and mechanical properties of the new class of materials – high entropy alloys (HEA), in the form of massive samples based on ferromagnetic (Fe, Ni, Co), FCC (Al, Cu та ін.), BCC (Cr, V) or bcc s.s. (Hf, Zr, Ti) metals.

We started research the phase composition and electrophysical (resistivity, thermal coefficient of resistance, strain coefficient) and magnetoresistive properties (anisotropic magnetoresistance) high entropy film alloys. Specimens of a total thickness $d = 30-80$ nm were obtained in a vacuum of 10^{-4} Pa by layer-condensation method with subsequent heat treatment up to 600

Sample (thickness, nm)	Concentration, at.%	δ	TKR·10 ³ , K ⁻¹ , T=300
Al(4)/Cu(3,2)/Co(4,5)/Cr(5,2)/Fe(4,7)/Ni(4)/Π	11/13/19/20/19/17/Π	0,045	2,0
Cr(7,5)/Al(4,5)/Co(7,3)/Cu(4,8)/Ni(7)/Fe(7)/Π	19/8/21/12/19/19/Π	0,043	1,8
Cu(10)/Co(9)/Cr(10)/NiFe(18)/Al(12)/Π	18/17/17/24,8/15/Π	1,001	1,6
Cu(32)/Co(9)/Cr(10)/NiFe(18)/Al(12)/Π	32/15/16/24,8/14/Π	1,000	1,8

K. In both the output and the annealed samples, the HEA has a fcc lattice ($a = 0,4604$ nm) with traces of bcc phase, the parameter of

which is close to the lattice parameters of α -Fe, or bcc Cr, and the solid solution a-Fe (Cr). The general characteristics of the investigated samples are presented in the table.

Measurement of the coefficient of strain-sensitivity (CS) with a longitudinal deformation of up to 2% allowed to obtain non-trivial results, namely, the two-stage deformation process with a CS up to 90 units, which is quite large for metal samples (see [1] for more details). Measurement of the magnetic resistivity at the longitudinal, transverse, and perpendicular orientation of the magnetic field relative to the direction of current flow indicates its anisotropic character with an amplitude of 0.20%.

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OUR FUTURE DEPENDS ON PROGRAMMING

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What do you think about our future? I can say that our future depends on programming.

So first of all, I would like to tell you about the development of technology:

- Development is closely related to technology. The radical change and advancement in the economy, as we observe today, is the result of the modern technology.

- Technology has brought about efficiency and quality in the manufacturing sector. Technological advancement has reduced the risk involved in manufacturing enterprises. There has been tremendous improvement in the field of health. Not only the average age of people has increased but the mortality rate has also declined.

- The development of technology, which itself is symptomatic of development, has brought about not only economic development but also radical changes in the social and cultural spheres of society.

The most interesting and important thing is that our future depends on programming, because Software is changing the world – from medicine and education to fashion and transportation – and it’s impacting the way we work and how we live. The possibilities are limited only by the number of people with the ambition, great ideas, and opportunities to bring their ideas to life. Tech jobs are growing three times faster than our colleges are producing computer science graduates.

Artificial Intelligence is the intelligence exhibited by an artificial (non-natural, man-made) entity. It’s the branch of computer science dealing with the reproduction or mimicking of human-level intelligence, self-awareness, knowledge, conscience, thought in computer programs. The essential idea of such a machine is to think in a manner similar to or at the same general level as a real human being.

In conclusion I’d like to say that now Artificial Intelligence is the main thing we should think about. All our future lives will depend on it, because we don’t know exactly how it will influence our lives.

So now I can say without any hesitation that our future depends on programming.

ERA Z: DIGITAL GENERATION IN ACTION

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In their forecasts for the near future, most of the demographers-futurologists bet on the achievements of generations Y and Z – that is, on the «millennials» – people born between 1983 and the mid-1990s (generation Y), and the so-called «generation me me» born in the 1990s and 2000s. The most far-seeing researchers leave part of the awards to generation alpha born after 2010. However, the future imagined by us gets outdated faster than the real one comes. So, who is actually the one creating our future?

Is anyone able to predict for sure what will happen when we get compact thermonuclear reactors for private use, or when wireless transmission of electric power becomes available? In particular, where will metallurgic and wires and cables manufacturing plants be in such case? What will the world, where a robot in a house is a commonplace (like laptops and smart phones today), look like? Or, for example, let's have a look at medicine. At present, it seems that it is only in distant future that organs for transplantation will be reproduced on 3D-printers. However, it is quite possible that there will be not much difference between a 3D-printer and a black-and-white lamp TV, as they will be standing on the neighbouring shelves in the museum of contemporary history. Therefore, let's take the middle path, which is the fundamental principle of the Taoist-Buddhist mentality and means the ability to pass without losses between the opposites, the skill to balance everything. We will look neither into Generation Y, most of which suffers from the “Peter Pan syndrome” not wanting to grow older and assume obligations and responsibility, nor at Generation Alpha, which will not be completely formed till 2025 since a significant part of its representatives' are still unborn. Generation Z, the first truly digital generation whose representatives' parents are often considered “digital immigrants” who had no modern technologies in their childhood.

Generation Z is interested in science and technology but at the same time it does not forget about art either. Popularization of

science and its growing role in society led to flowering of engineering and technical branches of science from the new perspective: robotics, bioengineering, biomedicine. Many boys of Z generation are future inventors who will push the science even further, way over the horizon. It would seem that the founders also seek independence like the millennials, but they are more pragmatic in their predecessors. There is a paradox: teenagers, who have always been considered rebels, might refuse from constant risk since they will know what it is like to grow up without an “airbag”.

As opposed to the youth belonging to Generation Y who do not care much about cooking, Generation Z who really can cook and loves doing it. Moreover they do it well and inventively using a colorful language of art. The Generation Z representatives strive to have everything at once. They do not mind paying any money for smart phones, however they consider shameful to pay for films, which can be downloaded for free. For people belonging to Generation Z it is much easier to communicate online than in person. 8 of 10 these guys have been registered in social media since their teenage year, so it is not surprising that they consider their virtual life to be no less significant than the real one. During their life, the representatives of this generation have seen a huge number of technologies and gadgets go outdated and replaced with new ones. That is why, they formed a special view on in the learning process: people belonging to Generation Z have finally become “self-educators”. This is the generation that seeks to create their own businesses. They do not want to be regular employees, they long to become proprietors. Most of them would love to turn their hobbies into their major sources of income. To them, creativity might not be just prospect for self-development but also a basic tool of their earnings. They do their best working on the creation of something incredible and unusual, for finding and demonstrating something that nobody has ever seen before. The generation of our parents did not have computers and mobile phones. As their children, we had had far more opportunities to develop our imagination and creative abilities.

METHOD FOR SOLVING GLOBAL ECOLOGICAL PROBLEMS

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Population growth and prodigal usage of resources is causing a gradual build-up of waste, decreasing biodiversity and accelerating depletion of natural resources which are not being replenished. Such problems which are ecological in essence but which reflect on economy, healthcare, society and politics alike, may in due time threaten living conditions for humans on earth and even life itself.

This paper discusses a novel enabling method which could lift humanity to a higher level and solve such global problems.

Overpopulation and intensive agriculture have caused over cropping: oceans are emptied of fish, arable lands are forced to overproduce, causing desertification and soil degradation due to high salinity, woodlands are being deforested. The human footprint has surpassed what the earth can sustain and renew. It greatly varies geographically: industrialized countries are consuming much more than their equal share. Global phenomena such as climate change, population growth, over cropping, depletion of resources and waste build-up will in the nearby future create the important ecological problems. World government does not seem adequately equipped to manage the inevitable transition period lying ahead of us.

The World Wide Watch Organization aims to make use of the Internet to build an alternative, global network for mutual support around each and every human being on Earth. A simple subscription with a one-time, cheap subscription fee would ensure life-long membership of a “global family”, with members distributed equally over the earth. The World Wide Watch Organization will launch global families by bringing members in contact with each other and by providing logistical facilities and advice.

Once the idea of global families takes hold, it is hoped that the World Wide Watch Organization will exponentially grow until the global population is covered. Information exchange between global family members should greatly speed up global acceptance of challenges.

DEVELOPMENT OF SCIENTIFIC BASES OF IMPLEMENTATION OF INTEGRATED SYSTEMS OF MANAGEMENT IN THE OIL INDUSTRY

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Nowadays the transition to the market of oil industry is more and more visible and the customer wants the enterprises that supply the equipment to have several control systems. Science tries to integrate these systems, and enable them to be high-quality and continuously refined.

Such control systems, based on the specification of the American Petroleum Institute Q1, the standards of ISO 9001, ISO 14001, ISO 50001, OHSAS18001, are quite diverse, but they need to be integrated so that they have effective function at one enterprise.

Scientific foundations help to solve this difficult task. An integration algorithm is being developed, and over time, it needs to be improved.

The management systems are constantly changing in such a way that for instance ISO 9001:2015 has changed very strongly and at the same time were complicated. Therefore, the relevance of the issue is the simplification of the management systems implementation through the scientific foundations.

The following tasks were formulated to achieve this goal:

- to analyze the current state and developing ways of the competitiveness of the oil industry enterprises, studying the modern legislation requirements, the requirements of international standards and international recommendations regarding management systems;

- to improve the scientific basis development, implementation and support of integrated management systems;

- to improve the processes of normative provision for the development, implementation and maintenance of integrated management systems in the oil industry;

- probation (testing) of scientific developments in real industrial conditions in the enterprise.

In the course of scientific researches, based on the subject field peculiarities and the formed tasks, the method of system analysis was used to develop the scientific foundations of implementation.

IMPROVEMENT OF THE QUALITY "MANAGEMENT SYSTEM AT THE SUBSIDIARY ENTERPRISE "DRILL COLLARS AND KELLYS PLANT", IN ACCORDANCE WITH DSTU ISO 9001: 2015"

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Quality Management System (QMS) - a set of organizational structures, techniques, processes and resources, that are necessary for overall quality management. It is intended for continuous improvement of activities, increasing the competitiveness of the organization in the market and determines the competitiveness of any organization. It is a part of the organization management system [2].

Any QMS includes goals, responsibilities, procedures and rules. All this is present in one form or another - documented or verbally - in any organization [3].

The Subsidiary Enterprise "Drill Collars and Kellys Plant" is engaged in the following activities: production, testing and implementation of weighted drilling and conducting pipes; production of metal products for various purposes; production of

forgings, steel casting. The plant includes the following production: steel; forging and thermal; machining.

The Subsidiary Enterprise " Drill Collars and Kellys Plant" has introduced and effectively operates the QMS, in order to compete with the products of the plant on the market, and to confirm the quality of the products produced. The effectiveness and efficiency of the QMS at the plant has been verified and confirmed by the American Petroleum Institute (API). Subsidiary Enterprise " Drill Collars and Kellys Plant" has a certificate of this institute, which gives the right to use the official monograph of API in its products, which fully meets the requirements of specifications API 7-1, API 7-2.

A strategic decision on the implementation of the QMS is taken by senior management and issued by order [3]. The Quality Policy at the Subsidiary Enterprise " Drill Collars and Kellys Plant" is aimed at increasing the level of satisfaction of consumers' needs, creating, maintaining and improving the QMS, in which the trained staff will be able to fully realize their capabilities.

Consequently, the modernization and structural adjustment of QMS should be carried out with the involvement of new technologies, new management methods that meet European and world standards, and oriented towards the production of safe products and services.

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3D PRINTING

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Technology of 3D printing is very enthusiastic both among ordinary consumers and among entrepreneurs. According to a study by Gartner, it was expected that in 2013, sales of printers worth up to \$ 100,000 will be almost 50%, and this year - up to 75%. Now 3D printers are used at enterprises to create prototypes, but this year we will see an increasing number of finished products. 3D printing can serve a source of inspiration. Chris Anderson, Wire magazine former editor-in-chief, writes in his book "Makers", that new industrial revolution is already taking place thanks to the availability of project documentation in open sources and 3D-printing. Many enterprises began to focus on the production of small quantities of goods to order. And thanks to crowd funding, such companies no longer require the support of venture investors.

There are several types of 3D printing technology. One of them is simulation by fusing. Makerbot is one of the best printers using this technology. Such printers melt plastic threads and form a plastic layer by layer until it completely fills the model. Makerbot printer uses two types of plastic: ABS plastic, which has high strength and is produced on the basis of oil, and plastic PLA - biodegradable plastic from natural raw materials. The other one is

stereolithography. In printers using this technology, a laser is used to cure the polymer, and the prototype is created layer by layer. With rapid prototyping, another 3D printing technology, the supporting part of the support is not used, so the process of creating it is faster, and using conventional stereolithography, the supports have to be removed manually. The next type is selective laser sintering. Here, for sintering powder metal, a laser is used, which, as it were, glues it together and thus creates solid objects. After sintering one layer, the model is lowered and a new layer is applied to its top.

With the help of 3D printer, you can create a lot of things. Wire magazine, for example, stands for pencils, flower pots or beads - using a 3D printer you can do anything you like.

3D printing will completely change the industry known to us.

Thanks to open electronic information sources, companies can modify the project documentation available in them and experiment with production schemes and individual details of the goods. Ultimately, they do not have to design each product on their own and deliver every detail, as local or regional manufacturers can design and / or print them on their own. Over time, long chains of suppliers will be a relic of the past. Most companies still refuse this technology, as it radically changes the industry. According to Basilier, the key to long-term growth in industry is the amount of materials that can be used in 3D printers. It is small so far, but it grows very fast.

NUMERICAL CALCULATION OF A STRESSED-DEFORMED STATE OF NEW IMPELLER SEALS FROM COMPOSITIONAL MATERIALS

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The most common type of rotor seals for centrifugal pumps and compressors are impeller seals. The main characteristic of slot seals is the stiffness and dampening properties, and their influence on the vibrational state of the rotor. There is a need to develop fundamentally new designs that ensure energy savings and pumped products, as well as environmental safety of pumping and compressor equipment. This is possible through the use of advanced composite materials.

In work impeller seal of centrifugal pump made of a composite material. Impeller seal is considered as a multilayer shell with a different number of layers and different materials. Difference between the difference of displacements of points of conjugate surfaces of adjacent layers and tangential stresses in the longitudinal diryction $u^{i-1}(r_i, z) - u^i(r_i, z) = k^i \tau_{rz}^i$. In the general case, k^i – predetermined parameter, which is determined by numerical and experimental studies. As limit conditions from this equation has two variants: $1/k^i = 0$ – elastic slippage adjacent layers relative to each other at mating surfaces, $k^i = 0$ – a perfect contact [1]. It is assumed that radial stresses and displacements do not occur when passing through the interface of the layers.

Using numerical methods obtained stress-deformed state of the impeller seal of centrifugal pump made of composite material, under the influence of thermal and force loads. A comparative analysis of the results. The proposed solution algorithm allows obtaining the calculated data for the evaluation of the effect of the physical-mechanical characteristics of individual layers.

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WHAT IS UX DESIGN AND WHY IS IT SO IMPORTANT?

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The interface is always interaction, the interaction of some system (it does not have to be a computer system) and a person (user). If the interaction is difficult, problems arise. To avoid them, you just need to create user-friendly interfaces that will be convenient and understandable to any! This is what User Experience design is doing. As said by Russ Unger (The author of “The project guide to UX Design”) User experience is the creation and synchronization of the elements that influence act users' experience with a particular interface, with the intention to influence their perceptions and behavior. Indeed, UX design includes various components: information architecture, interaction design, graphic design, and content, which form a user-friendly interface. Roughly speaking, this is not a collection of colors, style, products look, but one of the initial stages of product creation.

UX design is special because it deals in a greater degree with the study of users and the construction of the frame of the order (site, program, application). It takes into account all the details, determines every detail and every need for a detailed study of the task and the problem stated. It develops the product, which will be the most convenient and easy to perceive by the target audience. This kind of design is necessary for understanding the essence of the proposed product. UX solves the issues of setting goals and objectives: "what do we ultimately need to achieve?". It also performs the analyses of the final result whether the product meets the customer's expectations and the level of user satisfaction. It should be remembered that UX is extremely important for business. If you know your customers, you can create an engaging content, and provide a good service.

Summing up, one can say that UX design is really an up-to-date branch in the field of interface development. This is a long process, in which it is extremely important to intuitively feel the target audience, its moods, and needs. In order to achieve this, it is necessary to spend a lot of effort and time, to conduct the necessary testing, then get the desired result.

DESIGN THINKING

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Design thinking is a new process for original problem solving. Design thinking is a great innovation tool for tackling intricate questions and challenges. It not only offers an approach that generates prototypes, but also increases understanding about what works and functions, or what doesn't.

Over the past few years, it has been noticeable how design thinking is spreading in the growing variations of industries. Design thinking uses elements from the designer's tools like feeling and experimentation to arrive at innovative solutions. By using design thinking, you can make decisions based on what future customers really want instead of relying only on historical data or making unchecked bets based on instinct.

In the past, design has most often focused on creating new products aesthetically attractive, beautiful or increase brand perception through smart, remind something advertising. Making design a priority isn't just about meeting the brilliant expectations of today's consumers — it's a key way to excel, which helps organizations to be market leaders.

Basics of Design thinking:

1. Discover new thinking by learning about what people need.
2. Avoid obvious solutions and pay attention only to cool ideas.
3. Build prototypes to learn how to make ideas better.
4. Create a human story to inspire others toward action.

The top 5 approaches that will have the biggest impact to people's mind: cultivate curiosity, experiment often, cooperate with all production departments, spread ideas like a virus, do big and fast steps for the win.

Design thinking is a people-centered approach to innovation, which is based on the designer's tools for fulfilling people's needs, combining the possibility of technology and getting new business success.

NEURAL NETWORKS

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During last 10-15 years there has been a rapid growth of interest in artificial neural networks (NN). There are several reasons for this. First, the theoretical difficulties within the so-called perceptron model, popular in the late 1960s, were resolved. Secondly, there was cheap access to powerful and inexpensive processor devices, which facilitated both research in the field of model creation and work with real problems.

So, let us give the definition of a neural network. The neural network is a set of simple decision elements with a high degree of mutual relations. Although we gave this short definition, there is no universally accepted definition of a neural network. The majority of specialists working in this field will agree that the NN is a network of many simple solving devices ("elements"), possibly having small volumes of local memory. These elements are connected to each other via communication channels ("connections"), through which data is usually transmitted, encoded in some way. Elements of the neural network operate only with their local data, and on the inputs they receive information on the connections.

Some NN are models of biological neural networks, some are not. But historically many ideas in the field of the National Assembly came from the desire to create artificial systems capable of reasonable calculations, similar to those that the human brain routinely does, and possibly those that will help us broaden our understanding of the human brain.

Most NNs have some kind of "training" rules, in the process the weight of the links is refined based on the training data. In other words, the National Assembly "learns" by examples, just as children learn to learn something from the pictures they are shown. The network shows some ability to generalize already outside the training data.

In practice, NNs are especially useful for tasks of classifying and displaying functions in inaccurate conditions and have a lot of

data for training, but for which clear and fast algorithms can not be applied (as, for example, in expert systems). Almost any mapping between vector spaces can be approximated with arbitrary accuracy by means of direct-flow NNs (this type of NN is most often used in applications) if there is enough data and enough computing resources.

Neural networks are difficult, at least for now, to be successfully applied to tasks related to manipulating symbols and memory. And there are no methods of training the NN, so that they magically create information which is not contained in the training data. As for the reproduction of human consciousness and emotions, it still belongs to the field of science fiction.

Neural networks are of interest to a sufficiently large number of specialists:

Programmers - neural networks open up a field of new methods for solving complex problems.

Physicists use neural networks to model phenomena in statistical mechanics and for many other purposes.

Neuroscientists can use neural networks to model and study brain functions.

Psychologists - neural networks provide a mechanism for testing models of certain psychological theories.

Other specialists (especially commercial and industrial areas) may also be interested in neural networks for a variety of reasons.

The neural network opens up new possibilities that could not previously be realized in a sequential computer. Tasks that were difficult to solve by a whole team of specialists can now be solved with the help of a properly trained network. And perhaps in a very short time we will be able to finally study the structure of the human brain, thanks to the networks created by the images of its parts. And maybe someday the computer will speak to us in understandable human language.

3D MODELING IN THE MODERN WORLD

D. Kayota – Sumy State University, group PhD-72

N.V. Maliovana – E.L. Advisor

Nowadays, modern technology has made a great progress. Most of the progress is achieved by 3D technology. One of the definitions of 3D or three-dimensional graphics - Computer Graphics section covering algorithms and software for manipulating objects in three-dimensional space, as well as the result of such programs. 3D is a very serious mathematical apparatus, implemented in the core of the graphics system producing three-dimensional images.

Ease of use, relatively low hardware requirements and truly amazing possibilities of such systems have provided its rapid spread and popularity. In the field of design and animation, along with manufacturers of well-known programs like 3ds Max, Maya, SOFTIMAGE / XSI, Lightwave 3D, the companies are engaged in the development of specialized focus optioned modules.

There are many ways of transformation of reality into virtuality and atoms into bits. However, there are only two basic techniques: a manual modeling object in special editor program and a 3D object scanning with the subsequent processing in that same editor.

3D Graphics technology and printing technology 3D entered many spheres of human activity, and bring a huge profit. Three Dimensional images bombard us every day on television, in the movies, when working on a computer and playing 3D games, billboards, neon lights, clearly presents all the power and benefits of the 3D graphics.

In conclusion, 3D modeling is used in all spheres of life. There are 3 major branches which today cannot be imagined without the use of three-dimensional models. It is entertainment industry, medicine, industry, engineering. In the future 3D modeling will be used in all spheres of life. Using 3d modeling, a person can create absolutely everything and use it in his life. 3D modeling will make our future.

CULTURAL BREAKTHROUGH OF “FEARLESS GIRL”

D. A. Kholin, Sumy State University, student ZT-62 (RK)

T. V. Pochatko, English language advisor

As I study media and advertising, work out social projects I want to introduce the most inspired advertising creation of 2017.

No other work of brand advertising in 2017 was as conceptually strong, or as culturally breakthrough, as McCann’s Fearless Girl statue for State Street Global Advisors (SSGA).

The bronze sculpture, crafted by Kristen Visbal, was instantly iconic and literally an overnight sensation. Dropped in New York’s Bowling Green Park before dawn on March 7, staring down the famous Charging Bull, she brilliantly embodied female leadership in business, which SSGA supports. Mobbed within hours, Fearless Girl became the city’s hippest tourist attraction. She’s also one of advertising’s most inspired creations ever—forged from an ancient medium, yet perfectly crafted to deliver the most modern of marketing messages.

She also weathered storms, from the ire of the Charging Bull artist to accusations of hypocrisy after SSGA parent State Street was forced to pay \$5 million for allegedly underpaying women and minorities. Yet each crisis only amplified her message, redoubling her influence. She blazed through the advertising awards circuit, too, winning top prizes at almost every show, including a well-deserved four Grand Prix (and 18 total Lions) at Cannes.

But most important, she was — and remains — an inspiration to the next generation. No one who has seen any of the thousands of photographs of little girls posing with Fearless Girl can doubt her immediate power — the physical embodiment of a vision of everything they can be, in a world that so often wants them to be something else.

“What we make is so ephemeral. To make something that might be around for a while is so gratifying,” senior art director Lizzie Wilson told shortly after the statue’s debut. She needn’t worry — Fearless Girl is one for the ages.

For more information and photos pay a visit to the web-site:
<http://www.adweek.com/creativity/the-story-of-the-fearless-girl-from-the-women-at-mccann-who-made-her/>

COFFEE IS YOUR ALLY AGAINST LIVER CANCER

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M.M. Dunaeva, Senior Lecturer

Who does not like coffee? This drink is our morning therapy, an injection of energy for the body and a pill to improve the mood. And do you know that coffee is also a wonderful natural hepatoprotector?

A couple of cups of coffee a day can seriously reduce the risk of liver cancer, according to a group of Japanese researchers. Such conclusions were made on the basis of observations conducted over a decade involving more than 60,000 people.

Also, this problem was studied by experts from the International Foundation for Research on Cancer in London. According to scientists, the most unexpected and interesting feature of coffee is its ability to act as an anti-inflammatory agent:

1)Coffee suppresses genes that cause the appearance of inflammation in the liver.

2)Regular consumption of 1-2 cups of coffee every day contributes to the restoration of liver cells. This means that this drink helps heal infected cells and reduces the amount of fats in the liver.

Coffee is useful, but only until there is quality food in the diet and the person does not smoke, doctors stated.

In addition, scientists say that it is better to drink coffee with

caffeine. According to them, at removal of caffeine the drink loses at once a lot of antioxidants, which struggle with oxidative stress and inflammatory reactions in an organism.

According to a study published in the Journal of Clinical Gastroenterology and Hepatology, regular use of coffee has improved the state of about 40% of patients with hepatocellular carcinoma (hepatic cancer, the most common malignant liver disease).

Experts note that there is a strong explanation why coffee helps protect the body from liver cancer. The reason is that coffee has the ability to reduce the risk of diabetes.

During the study, 27,793 participants aged 20 years and older recorded how much coffee they drank a day. The researchers measured the level of enzymes in the blood to find out the liver function of each person. A low level of certain enzymes in the blood indicates good health of the liver. Those participants, who during the experiment reported that they were drinking 3 cups of coffee a day, had a lower level of enzymes than those who did not drink coffee.

Of course, a lot of research is needed to find out exactly what coffee norm is needed to improve the overall condition of patients, but scientists have already concluded that regular coffee consumption has a positive effect even on patients suffering from chronic liver disease.

MICRONEEDLES AS A NEW METHOD OF DELIVERING INSULIN TO THE GASTROINTESTINAL TRACT

A.D. Klochko – Sumy State University, group MTSm – 701
O.I. Nefedchenko – E L Adviser

Nowadays the oral route of drug delivery is preferred by patient and physicians because of its quick effect. But biological drug, such as insulin, is effective only if it is delivered via injection. Large proteins given as pills are degraded and broken down before they can be absorbed in the stomach.

Microneedles for drug delivery could be a method of circumvention the need of subcutaneous drug administration.

The prototype device is a capsule of clear acrylic and 25G needles. It's sized as a large multivitamin (1 cm in diameter, 2 cm in length). The capsule has a drag reservoir to house the therapeutic payload and pH-responsive coating to cover the ill allowing the easy injection. After passing the stomach, the pill enters the intestine. The coating begins to dissolve and the microneedles are revealed. The intestines' peristalsis – contraction of its muscles – presses the reservoir and drug is ejected into the tissue of intestine.

The results of testing pigs of similar weight have shown that it is quite effective to use microneedles for delivering macromolecules. Administering insulin by the capsule does regulate faster the blood glucose levels than oral delivery (non-effective), subcutaneous injection.

This method is painless though the intestine is devoided of pain receptors. This advantage helps to ensure that people take their medicine every day, because a lot of people refuse to do it though it is painful.

The safety of microneedles was tested at pigs. The device was placed through an over-tube into the stomach of each pig and then released. A central metallic core let the rapid detection of the device by the X-ray machine. The X-ray images have shown that the pill was found to be safe and well-tolerated.

Microneedles are still needed further research. It will take 2-5 years to develop pills for undergoing human trials.

INNOVATIONS IN DENTISTRY

A. Kovalenko-Sumy State University, group SM – 604

Y.S Kozachenko – E L Adviser

Dentistry is one of the most advanced branches in medicine. Every month and year, new technologies, materials and gadgets are introduced in this industry. Just imagine that you get a denture within an hour after a visit to a dentist, or even possibly having a dental examination at a distance. It is possible even to build a new teeth. And the most interesting thing is that it's all working in Ukraine now. Let me introduce the brightest innovations in the field of dentistry.

Modern medicine has created a "smart" toothbrush that works through Bluetooth and uses a set of sensors to track the cleaning of teeth. A 3D map of the oral cavity and teeth, allows you to brush your teeth and announces that they are clean little or vice versa, long and hard.

At present there is the use of painless electric current, which prevents anesthesia and protects it from various complications. With the help of electric current, it is possible to reproduce the mineral layers of enamel at an early stage of destruction.

First of all, the specialists have noted the feature of the laser to remove the remnants of water from the tissues of the tooth, secondly, the laser does not damage the healthy tissues of the tooth, and most importantly it kills the harmful bacteria.

One of the biggest inconveniences with which the doctor and patient are squeezed is the need to open your mouth widely. An effective innovative solution is an intraoral camera. These are "liquid lenses" that work like a human eye, they allow you to create clear images of the entire oral cavity.

In my opinion, innovations in this area allow you to take care carefully and look for another innovations. Modern technologies and gadgets make every visit to a dentist not only useful, but also it can be a pleasant occupation. We believe that with the development of medicine, the country is developing as a whole. And I hope it is possible that in a few decades we will have the opportunity to do vaccination against caries.

IMAGE TAKING TECHNOLOGY APPLICATION

Krasulya B.O. – Sumy State University, group IT-71

Mulina N.I. E L-Adviser

The basic concept of photography appeared in the 5th century B.C. The first camera was invented 16 hundred years later. This camera did not actually record the images, it just simply projected them onto another surface and images were flipped. The first lenses appeared in the 17th century, and the cameras became portable enough to move it from place to place.

In fact, photography is about creating solid images by recording light or other electromagnetic radiation using an image sensor that detects and converts light rays into signals, small current bursts that transmit information.

There is a great amount of camera types such as Plate camera, Folding camera, Box camera, but the most popular type is Compact Digital Camera. The main producers are Nikon, Canon, Sony, Sigma, Panasonic, Pentax, HP, Olympus, Fujifilm, GoPro.

Microphotography. This photo type allows to capture the hundreds and thousands small objects and particles. Thanks to microphotography, such processes and phenomena as, for example, cell division were discovered and understood.

Astrophotography. It is a modern method of taking pictures of and studying faraway astronomical items. Nowadays, much attention is paid to space photography. Space objects are taken both from automatic interplanetary stations and from spaceships controlled by astronauts.

Commercial photography. Commercial photography is the shooting of models, interior items and landscapes. Pictures are used for different purposes in advertisements, magazines, newspapers and various websites.

Advertising photography. An advertising photographer uses a wide range of images to sell not only products, but also concepts, lifestyles and ideas. Advertising photography is devoted to creativity.

Apparently, image-taking technology is going to grow exponentially. Further research will help us to imprint and discover unbelievable things.

PREVENTION AND SUPPRESSION OF TRAFFICKING IN PERSONS.

Inna Kravchenko, Sumy State University, group SR-71
EL Adviser O.R.Gladchenko

The problem of human trafficking was mentioned for the first time at the beginning of the 20th century. It is known that this type of traffic is in the third place after the traffic in arms and drugs. Millions of people around the world become victims each year. Men, women as well as children can be the victims. This type of slavery can manifest itself in various forms: forced labor, forced begging, sexual exploitation. According to the data of the International Organization for Migration (IOM) more than 230 thousand of Ukrainians became the victims of human trafficking during the period from 1991 to 2016.

The common misunderstanding is that no one is immune from this slavery and therefore, the victims can be from both the poor and the more developed countries. People who live in difficult circumstances are attracted to the opportunity to improve their lives. Human trafficking is a profitable business. Affected people have been receiving the assistance since 2000. From January 2000 to June 2017 IOM provided comprehensive assistance to more than 13400 people. The organizations that provide the assistance are as follows: the UN, OSCE and IOM.

Thus, in order not to become a victim of slavery it is necessary to: sign only those documents the content of which is understandable to you, be aware of the work you accept employment, be aware of the rights of migrants in the country you are traveling; find the place for future living by oneself. Before leaving you should leave the copies of documents, contact numbers of employers, your location and the organization you plan to sign a labor agreement. Never give your passport and other documents that confirm your identity. It must be remembered that the development of this global problem depends even on the military actions on the territory of the country.

2017 is declared as the year of combating human trafficking.

INFORMATION AND COMMUNICATION TECHNOLOGIES AND THEIR PROBLEMS

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EL Adviser O. R. Gladchenko

In our modern world the level of progress is determined by the level of development in the ICT sphere. It is a new branch of modern science and technology. ICT development includes many types of infrastructure and services, ranging from communication technologies, such as networks, Internet, voice, data, to specific applications, such as banking, education, medicine. Also, today IT covers the scientific branch of knowledge uniting a large number of scientific areas: artificial intelligence, computational mathematics, computer science, software engineering, computer network architecture.

ICTs play a key role in modern human development and have a lot of advantages. One can highlight the main ones:

- sharing information and knowledge;
- access to remote learning resources;
- creation of new jobs;
- instant access to electronic libraries, databases;
- saving time;
- cost-effectiveness.

Despite the fact that ICTs are penetrating more and more into various spheres of social activity, and that they play an important role in the development of the economy, medicine, military science, there are a number of problems concerning this area.

1. Lack of live communication. Though technology is supposed to make us feel more connected by allowing to stay in touch with our friends, the most popular problem is that we get used to living in the virtual world. More often we communicate to each other through the Internet and that is why we need live communication. Now it is the greatest problem of young people. They become dependent on phones and tablets.

2. Cybercrime. Nowadays all people use banking cards. It increases the risk of being deceived by hackers. Hackers exploit

communication technology to steal financial information. Viruses cause computers to malfunction and hackers sometimes generate spam email.

3. Children’s safety. Technology exposes children to a number of risks such as graphical sexual images, different games, some of them can increase the risk of suicide. These factors can cause mental illnesses, bad health, physical diseases, and a set of another problems.

4. Reliance on technology. When solving different tasks we use computers instead of using our brains and thinking. People rely on technology for their memory but the less you use your memory, the worse it becomes.

5. Inaccessibility to remote settlements. Despite the fact that access to the Internet exists almost anywhere in the world, the situation in remote settlements remains still difficult. People do not have the possibility to use information and communication technologies because of the absence of the Internet in the villages.

6. A large amount of unnecessary information. Every day while surfing on the Internet we face a lot of intrusive advertising and unnecessary information which we watch and read involuntarily. This distracts from the needed information and accomplishment of tasks.

7. Inability to use ICTs. Now every child can use smartphones, tablets, laptops, but the older generation does not even know how to switch them on. This limits the adults when doing work and in daily life and they have to address to younger generation for help.

Thus, having considered the most relevant problems, we can not speak only about the usefulness of ICTs, since along with a large number of advantages, there are a number of serious disadvantages that still need to be worked on.

HOME AUTOMATION AS A WAY TO LIVE EASIER

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Zaitseva I.A. – ELAdviser

Domotics or home automation is an automation system that is supposed to be used in usual homes called smart homes or houses. It involves the computerization of different home units such as lighting, heating, air conditioning, ventilation and security.

The history of home automation dates back to the 1900s when self-contained electric or gas-powered home appliances became available to be implemented due to the introduction of electric power distribution. This consequently led to the invention of sewing machines, dishwashers, dryers, etc. The first general-purpose home automation network technology was developed in 1975 and was called X10. 3 years later, the 16-channel command console was included which enabled users to control such systems as lighting and heating. After that, other systems were made controllable during progress.

Home automation is divided into three generations. The first generation involves only a proxy server that works wirelessly whereas the second generation uses artificial intelligence to control electronical devices. A good example of a second-generation home automation would be the Amazon Echo. It is capable of connecting to several smart devices and becoming a central unit of the home automation system. The third generation consists of robot-buddies like Roomba, a computerized vacuum cleaner. As a rule, domotics system consists of such devices as the hub that controls the whole system, the sensors that receive the information about the outer world and the actuators that perform commands. Usually, domotics are sold as a pack of varied devices produced by one provider. Thus, the customer needn't face optimization problems or think about how to set up the whole system to work properly and avoid errors. However, open-source software systems are always available for purchase.

It is obvious that home automation has its drawbacks. These are the lack of technical standards in terms of software and hardware variations, at times high pricing but the comfort and convenience outweigh previously named drawbacks.

INTERNATIONAL EXPERIENCE ON THE ROAD TO A PLASTIC-FREE WORLD

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Where to put an infinite number of plastic bags, plastic bottles, aluminum cans and other containers? Burying them into the ground means polluting the lithosphere. Waste dumping into the seas and oceans means damaging the hydrosphere of the planet. Burning them means harming the atmosphere.

According to the data of UN, plastic wastes cause annually the death of 1 million birds, 100,000 marine mammals and an incalculable number of fish.

Today, special polymer materials are used to produce biodegradable packaging, i.e. the packages which are exposed to environmental factors such as sunlight, moisture, temperature, soil microorganisms are destroyed to low-molecular compounds that do not harm either the nature or the human health. However, scientists claim that this “greener plastics” are well-invented, but do not lead to the desired results, for having too many cons.

An alternative solution of reducing plastic wastes was launched in the Netherlands in 2018. Amsterdam welcomes the first supermarket in the world with plastic-free aisles. More than 700 goods and products including meat, rice, sauces, dairy, chocolate, fruit and vegetables are available on plastic-free aisles of the Amsterdam supermarket Ekoplaza. The supermarket will also test new recyclable packaging materials and use traditional materials including glass, metal and carton. Till the end of 2018 the supermarket chain will open 74 similar stores around the whole country.

The UK also keeps abreast of the modern environmental plastic-free tendency. The Prime Minister Theresa May has announced that the plastic packages and wastes will be banned in the whole country within 25 years. In the nearest time the UK will introduce the fee for using throwaway plastic packages and containers in stores.

CARBON FIBER AS AN IDEAL MATERIAL FOR PROSTHETICS

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Today the main task of prosthetics is to produce chip and custom-made limbs to match the patient. The great advantage of fiber composites is that we can make lightweight spare parts with thin walls. Also it is easier and faster to produce composite parts, then aluminium or titanium ones.

A prosthesis should fully replicate the functions of the natural organ. When we examine a bone, we see that different regions are not identical. There are a lot of different collagen and hydroxyapatite ratios. Nowadays it is possible to vary levels of strength in different regions of a component, varying wall thicknesses in different parts of artificial part of body by adding some layers or reducing their number.

Every known material loses some of its strength upon repeated bending for a certain number of cycles. Finally it brings material failure. The lifespan of the aluminum prosthetics is only 3 years. Naturally, a gradual reduction in the strength and a short lifespan is not acceptable for a prosthetic device. The high residual strength of carbon fiber composite allows to use it in artificial parts of body.

The specific strength of the carbon / epoxy composite is very high. It is possible to produce a prosthesis that has the same strength as a natural leg, but is 60% lighter. Thanks to this new material, a total leg prosthesis could weigh nearly two 2 or 3 kilos.

Speaking about another qualities of artificial parts of body I would like to add that the material of prosthesis must be easy to clean, non-hygroscopic infections, resistant to UV-rays, resistant to corrosion and to bacterial, and cosmetically acceptable. Epoxy resin does not irritate the human skin and is non-allergic.

When we are speaking about a material for the production of prosthetics, carbon is an ideal material due to a number of factors. Thousands of people all around the world can live a better and more fulfilling life thanks to carbon composite prosthetics.

MODERN ONLINE BUSINESS ETIQUETTE IN UKRAINE

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Ph. D. N.V. Maliovana – E L Adviser

Digital possibilities of online communication have already conquered over one-third of the world`s population. Nowadays, it is a new culture of socializing, in which we live and interact. It has expanded far beyond the private contact area, having become integral part of the business intercourse.

The superiority of digital communication over telephone calls is analyzed in media, discussed in forums, studied in researches and books. “The business world must be flexible as to the requirements of new social communication types and, consequently, of the new communication situation, in order to prevent substantial mistakes. Image and trust are at stake”, warns linguist Erika Darics in her book *Digital Business Discourse*, in which she researches latest trends business communication. Annual 20-25% rise of smartphone owners in Ukraine are also results in the increasing number of those using online communication applications. According to the data of mobile operators, Ukrainians are massively stopping making classic phone calls and sending SMS, and start using social networks. This explains why so many new package propositions in favour the bigger Internet traffic are presented.

“Best ringtone is the silent one” - this opinion is supported by more and more users of mobile phones, since, apart from the regular calls and SMS, our smartphone continuously sends notifications from Messenger, social networks and email. Even vibration mode is not recommended or conferences, important meetings or, for instance, work in the open space office. Yet, not have to worry about missing important call. In one of its researches Flurry analytics company says that owners of smartphones use them for over hours a day. What is more, according the information of Lookout portal, more than half of the people using online communication channels check for new messages every hour.

The fact that Messengers are becoming increasingly favoured by no means gives the right to bring chaos and ignorance to

this area. Quite the opposite: specific rules of communication have been formed here. According to experts of the Robert Half staffing agency, the key points are attention and restraint. “Attempts at humour or sarcasm can be misinterpreted. Make sure you are familiar with the recipient’s sense of humor before attempting to be funny”, advise HR-special of the agency. This particularly applies to those who simultaneously participate in several chats, including professional ones. You have to be careful to pervert your spicy private conversations from getting into the center of attention caused by your mistake of jabbing your finger hastily into the wrong recipient. As to language: the Messenger style does give business communication certain democratic nature. Still, you cannot abuse it in business online intercours – it is better to be specific and informative as possible.

Admirers of emoticons and stickers should also be warned. Their superfluity and excessive express on are considered as bad style. Be prompt in answering and, accordingly, decision-making. Your interlocutor must receive your reply within one day. This is one of the advantages of online communication recognized by the business industry.

The Robert Half experts recommend maintaining the hygiene of posts. “If you posted a photo from a business event, don’t tag people on it without their permission. Don’t gossip in comments and don’t pass unverified information», advises the staffing agency.

Social networks will easily smoke out the liar. For example, if everybody at work knows that you are on sick leave, and you are actively posting new photos from the places you visit, it is quite for the employer to say goodbye to you.

Experts advise not to neglect the old-timer of the digital business communication – email. The electronic mailbox continues holding the position of an official and reliable online tool for the transmission of information in the professional environment.

If you are a businessman you should choose the best online communication application considering the most effective interaction with your work friends, co-workers or business partners. The choice is yours...

EYE GAZE TECHNOLOGY FOR PEOPLE WITH DISABILITIES

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N. I. Mulina – EL Adviser

Those people who lose control of their physical efficiency live a hard life despite their mind is still active. They can not experience life like others and it makes them lock inside their own bodies. Different diseases from numerous kinds of Sclerosis to severe brain injuries or a serious stroke make difficulties for people with most of their daily activities. In Ukraine, there are at least 2,8 million people with disabilities. Some of them can consistently control only their eyes without tiredness. While medicine cannot treat motor neurons and let patients retrieve active life they used to have, modern technologies, eye gaze technology in particular, can help them to keep in touch with the world around.

Tobii Eye gaze systems – developed by The Tobii Group (Sweden) – continually send and receive light signals. Infrared light travels from a camera to a human’s pupil and returns as reflected. Like this, eyes movements are translated into mouse cursor movements. It takes a winking’s time to get a result.

Although incapability partially robs users of their activities, Eyegaze Edge enables them to communicate with the world. Using this device, disabled people can hold conversations by sending messages, surf the Internet, participate in online networks, and even study using movements of their eyes.

OptiKey is another device that looks like a webcam. It tracks eye movements while a person shifts gaze from letter to letter. So, people can click and type. The appliance contains a speech generating module and people with special needs can even speak through a computer without using their hands or voice.

Using this technology and related devices, people can use television, read eBooks, watch videos from YouTube, update their Facebook page, send emails, wirelessly use PC and do other amazing things.

Although scientists have not found efficient disease cure yet, patients have real possibility to obtain some of their routine activities with assistive technologies.

THE BIO ROBOT REFRIGERATOR

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V. V. Havrylova – EL Adviser

Nowadays our world is closely connected with technologies. We improve, develop and discover something new every day, and without these achievements we would not have progressed so far. Scientists, researchers and designers from around the world try to invent new gadgets, tools and machines that will make our life better, easier and more interesting. *One great example of this technology* is the **Bio Robot Refrigerator**. This is the creative idea of the designer Yuriy Dmytryev.

This futuristic appliance could revolutionize the refrigerator design we have always known. The device is filled with the bright green biopolymer gel, which with the help of luminescence, reaches the desired cooling temperature and stores all products in a vacuum, enveloping them with their own mass.

Using bio-gel technology, this refrigerator uses much less energy than the standard fridge, because it is not cooling wasted space. In order to retrieve your food, you need to stick your hand through a non-sticky gel and pull your food out. The gel is said not to crumble or fall apart, and look attractive as well. At the same time, the energy for cooling is taken directly from the environment and therefore the refrigerator does not need a traditional power source.

The coolest part of the design of the Bio Robot Refrigerator is that there are no doors, shelves and drawers. It can be mounted on a wall either upright or sideways. The dimensions of the refrigerator and its position in the room can be changed. This appliance can even be suspended to the ceiling. This design feature would be a great solution for space issues inside a growing urban environment with smaller apartments.

As for a noise pollution, this fridge does not require any motor and thus, it eliminates the humming noises that *traditional refrigerators* produce.

Now this refrigerator exists in the form of a prototype and needs research and development. But we hope this innovation will appear in our kitchen in the nearest future.

ADVERTISING FUNCTIONS

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Nowadays we are surrounded by advertising. So, we open up our favorite magazine, and there are glossy ads for clothes, shoes, cars, or beer. We turn on the TV, and smiling faces on the screen introduce us soap, toothpaste, candy, and even politicians. Advertisements are an insidious form of brainwashing, because 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.

Melanie Dempsey and Andrew Mitchell from Consumer Research Journal suggest that the picture might not be so rosy. These researchers did two clever studies that ought to make us think twice about how much advertising we allow ourselves to be exposed to. We usually assume that advertising functions mostly to tell us about the properties of a product. A particular detergent might advertise that it gets stains out better than competitors, that it smells good, and that it leaves clothes feeling fresh. We believe that these properties are ones that will help us to choose the detergent we want to buy. However, ads also do other things. One thing they do is to take a product and to put it next to lots of other things that we already feel positively about.

So, why do we choose things just because we feel good about them? The world is a busy place. It is hard for us to feel confident that we have all of the objective facts about anything, whether it is products, people, or choices of things to do. The feelings we have are often a good marker of what is safe to do and what is likely to turn out well. If we have to make a choice, and one of the options just feels good to us, then we are likely to go with the one that feels good.

For more information pay a visit to the website:
<https://www.psychologytoday.com/us/blog/ulterior-motives/201008/what-does-advertising-do>

CRYONICS AS A WAY TO SAVE LIVES

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Nowadays there are many rare species of animals, which in time will most likely disappear. Now scientists and politicians are trying to solve the problem of the disappearance of rare species of animals, but unfortunately they do not quite get to it.

There are also people who would like to freeze themselves to wake up a few dozen years later, because now they have some health problems that they cannot solve but in the future, they hope that it will be possible. With the current state of the technology, cryopreservation of humans and large animals is irreversible: it is impossible to revive a person after freezing him. Moreover, it is impossible to revive an amputated head or brain. Therefore, people are subjected to cryopreservation only after a legally fixed death of the brain, otherwise "cryonics" would be a murder.

Every year, scientists advance further and further in the research of cryonics. Of course, now it is allowed to freeze only dead people because otherwise it would be considered a murder. There are only a few cryonics firms in the world that have their own storage facilities. Cryonics is not very popular, perhaps because of the high cost and lack of assurance that safe defrosting and treatment technologies will become available in the future, as with the generally accepted traditions of burial. Despite this, the number of cryo firm`s customers is gradually increasing.

Studies in this area are conducted on an ongoing basis, but so far no one has been able to say how in the future it will be possible to unfreeze the bodies and when it will be hypothetically possible. The arguments against it include criticism of some scientists, questions of ethics and religion, general distrust of people to this idea.

The main argument of all those who are against, remains unchanged: what is the point in living forever or waking up in 100 years without memories and family? The only true answer does not exist.

THE ANALYSIS OF DYNAMIC OF CENTRIFUGAL PUMP

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Dynamic characteristics of the high-speed machines' rotors are mainly determined by hydrodynamic forces operating in the gaps of the flowing part of contactless seals, which, depending on the design and conditions of the sealing units, can stabilize its dynamics and reduce vibroactivity, or vice versa, cause loss of dynamic stability or rotor self-oscillations destructive for a machine.

The peculiarity of spoiler seals is that they represent full-fledged low-loading hybrid slide bearings and have a significant effect on the vibrational state of the rotor. Due to this, the seals act as additional intermediate supports, increasing the critical rotor frequencies.

Multi-gap seals are used to reduce volumetric losses in centrifugal pumps.

Since multi-gap seals are some reserve for increasing the volumetric Energy conversion efficiency, the study of the qualitative effect of their individual parameters on the magnitude and direction of hydrostatic force is of practical significance.

The analysis of the multi-gap seals effect allows to choose their design so that the level of vibration does not go beyond the permissible limits throughout the working range.

The dissipative force F_d and the circulating force F_ω are considered from the radial forces that arise in the ring throttles, as they are given by the pressure flux F_p and the displacement stream. The initial equation of the viscous incompressible fluid in the channel is the Reynolds equation of the pressure distribution in the short annular channel with the corresponding boundary conditions.

Free rotor volatilities in multi-gap seals are considered. System frequencies are received, taking into account damping, depending on the frequency of rotation at different pressures. Based on the results of calculations, the characteristics of a three-spray with a two-spray seals are compared.

THE ANALYSIS OF THE MARKET OF SOFTWARE COMPLEXES FOR CONSTRUCTION OF AN INFORMATION MODEL OF COMPLEX INDUSTRIAL OBJECTS

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Due to the complication of the development of industrial facilities is arised a number of problems such as errors at all stages of design and construction, low production rates which leads to large losses of finance and time. As a consequence, it becomes necessity to introduce information modeling (BIM) for the design of complex industrial facilities. BIM is the process of creating and managing information about an object at all stages of the life cycle. The introduction of the information model allows increasing productivity, shortening the time for issuing project documentation, reducing the number of errors, and organizing successful joint work.

For selecting a software package is used the hierarchy analysis method. This is a method of comparative analysis and ranking of objects characterized by sets of criteria and indicators, quantitative and qualitative. Let's consider the most popular complexes of construction of information models of complex industrial objects.

Autodesk Building Design Suite is a specialized tool of the architect, engineer, constructor, builder. The complex combines information modeling technology (BIM) and CAD tools for efficient design, visualization, engineering calculations and modeling of the construction process. For example, the typical workflow of an industrial organization in an Autodesk Building Design Suite might look like this: architects develop an information model of a building in an Autodesk Revit environment and create a complete set of project documentation like drawings, specifications, explications, etc. Calculators conduct a comprehensive analysis of this model in Autodesk Robot Structural Analysis Professional, and the BIM-manager collects all the design data and simulates the construction process in Autodesk Navisworks.

Autodesk Infrastructure Design Suite is a software complex that implements BIM technology for designing infrastructure

objects. Intelligent computer-based tools allow you to work with high quality, always have the right information at hand and make the right design decisions. The software products are included in the complex provide engineers with real advantages at all stages of design and operation of transport facilities, land management and water use projects.

Autodesk Plant Design Suite is a full-featured and cost-effective software package for the design of process facilities. It helps to effectively carry out design work, prepare models and perform checks. Users get the opportunity to innovate faster than competitors, to freely exchange project information, to conduct design according to the schedule and within the budget.

V-Suite® Core is a platform based on the management, integration and interaction of 3D virtual objects. A complete and interactive model of the object, consisting of a database of tags, standards, descriptions, and a change management mechanism allows the plant model to remain relevant and maintain the integrity of the model. V-Suite Core is an open, service-oriented infrastructure that allows INOVX applications and third-party applications to interact and add a huge number of end users. The client-server architecture of V-Suite Core allows each functional organization in the enterprise to access and view a physical 3D model and corresponding data.

So, we can conclude that BIM-technologies enable us to design more efficiently, better, and more accurately manage risks. However, there is no unified BIM technology. It is necessary to choose which of the software products is better suited for specific tasks. Despite the fact that BIM facilitates the workflow, final decision is still make by a specialist.

EIN INNOVATIVES GERÄT ODER DIE ERSTE KÜNSTLICHE BAUCHSPEICHELDRÜSE

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Es ist allgemein bekannt, dass bei der Zuckerkrankheit des 1. Typs die Bauchspeicheldrüse das Insulin nicht produziert. Das Proteohormon von dem Pankreas hilft dem Organismus die Glukose aus dem Zucker und den Kohlenhydraten in die Energie umzuwandeln. Mangel oder Überschuss des Insulins kann zu den verschiedenen Folgen führen.

Das neue System Medtronic Mini Med 670G, die als “künstliche Bauchspeicheldrüse“ oft genannt wird, ist ein großer Schritt vorwärts. Das System ist für die Korrektur des Insulinniveaus vorherbestimmt.

Das System besteht aus:

- dem Sensor, der das Niveau der Glucose im Blut unter der Haut (CGM) misst;
- der Insulinpumpe;
- dem Pflaster für die Infusionen, das das Insulin aus der Pumpe durch Katheter in die Haut liefert;
- dem integrierten Schaltkreis, der die Daten für die Optimierung der Zustellung des Insulins für die Minute verwendet.

Der Prozess funktioniert mittels der Messung des Niveaus der Glukose alle 5 Minuten und der automatischen Einleitung oder des Abzugs von Insulin. Während der Apparat das Niveau des Insulins automatisch reguliert, müssen die Benutzer die Insulindosen für die Deckung der konsumierten Kohlenhydrate doch manuell einführen.

Dieser Apparat hat eine große Zukunft bei den Kranken mit Zuckerkrankheit. Heute kann das System sowohl einige Nachteile, als auch mögliche Komplikationen haben wie z.B. Hypo- oder Hyperglykämie, Hautreizung und eine Rötung ringsumher des Pflasters für die Infusionen.

Das System Medtronic Mini Med 670G ist eine wichtige Entdeckung, aber die Welt wartet noch auf die komplett automatische künstliche Bauchspeicheldrüse.

VIRTUAL REALITY

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The actuality of our work is actualized thanks to innovative character of virtual reality (VR) computer technology. It uses virtual reality headsets or multi-projected environments, sometimes in combination with physical environments or props, in order to generate realistic images, sounds and other sensations simulating in such way a user's physical presence in imaginary environment. A person using virtual reality equipment can observe the artificial world, move around in it and interact with virtual items. This effect is normally created by VR headsets which consist of a head-mounted display with a small screen in front of the eyes. Specially designed rooms with multiple large screens are commonly used to create it..

The aim of our work is to tell some information and set up the aims of virtual reality technologies. To achieve this purpose, first of all, we must determine the sphere of its application and answer an exciting question what makes the development of virtual reality worthwhile. The most important reason is the potential entertainment value of this technology. Great number of films and video games are good examples. After all, the entertainment industry is a multi-billion dollar one and its consumers always seek for novelty. Nevertheless, VR has many other, but more serious, applications . In fact, a wide variety of applications for VR include architecture, sport, medicine, the arts, entertainment, etc. VR can cause new and exciting discoveries in these areas which influence our lives. Moreover, in some cases, wherever it is too dangerous, expensive or impractical to do something in reality, the answer is VR. From trainee fighter pilots to medical applications trainee surgeons, it allows us to take virtual risks in order to gain real world experience. In addition, more serious uses, such as education or productivity applications, are expected, since the cost of VR goes down and it becomes a mainstream. Virtual reality and its cousin augmented reality could significantly change the way we are connected with our digital technologies, humanizing our technology.

So, VR is the creation of a virtual environment. It is presented to our senses in such a way that we can experience it as if we were really there. It uses a lot of technologies to achieve this goal. It has both entertainment and serious uses. The technology is becoming cheaper and more widespread. More innovative uses for the technology in the future are expected, especially a fundamental way of work and communication due to the possibilities of virtual reality.

USING ‘CHATTING’ TO DEVELOP STUDENTS’ ENGLISH SPEAKING SKILLS

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Svitlana Mikhno – ELAdvisor

There is no doubt that English is considered to be the language of intercultural communication. Teenagers who spend most of their time online may use it to communicate with each other, no matter what their native language is. So, developing their English speaking skills is of high importance nowadays.

Multimedia software and the Internet has revolutionised language learning and by using some of the excellent services available we can now have real-time conversations.

When studying English it is very good to have a friend who either studies it with you or already knows English. If you do not have such a friend, then you need to get acquainted with any person in your English language course and offer a joint communication in English in the form of a chat. It can be in any social network or simply with the help of messages. In English, as in any other language, practice is crucial. Some people find it inconvenient to speak in the classroom because they are embarrassed about how they do that. And in the correspondence with your friend or a familiar person, you yourself will not be afraid of making mistakes and also may correct each other. Nowadays it is hard for many people to go abroad to get into the English speaking environment where they can communicate freely and fluently. So, chatting in English using online technologies may help here.

I used this myself and want to say that it brings its results. I'm very lucky that I have a good friend who speaks English and we chat in English only. I'm just one of those people who understand the written text well and can write something themselves, but when I talk, I get lost, do not understand anything, and I'm very worried. So “Chatting” was for me more than ever. At first, I did not really understand everything he wrote because his level of English was higher than my own one. But over time, I began to understand more and more words, besides he told me where I made mistakes. Later we began to spend time communicating in English in real life and this was and is still difficult for me. Maybe I have reached the limit which I can not yet cross. I do not know. And when I found out that there was such a task as “Chatting” in the English Language course at university, I was very happy. It was interesting and easy for me, since I already have a lot of experience in this.

If you don't have a friend who can practice speaking English with you, there are many websites which are a great way to practise your written English, as well; many are provided as a free service. Some forums allow you to contact and meet other people who are learning English in any part of the world, and other languages. Chatting can be private or public and available for all the people to read. Thus, anyone can read the messages, but only members can add their own messages, or just say "Hello!". The main purpose of such forums is to provide encouragement, advice, support and enjoyment, thus developing people's English speaking skills. It is a friendly environment in which to share ideas and have fun. Some forums are arranged into topics and you can always request a new topic.

We advise everyone to use this method when learning English. That brings new acquaintances, new emotions and will be appropriate for every person with any character. Especially it's very helpful for people who feel that it's embarrassing to say something in the classroom where there are lots of people and you are a focus of everyone's attention at that moment. The most important issue in this task is to practice English regularly and you will soon notice a positive result.

METRIZATION OF THE COMPLEX PLANE

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This research examines the possibility of compactification.

Compactification of a complex plane by the addition of the infinity point ∞ , $\bar{C} = C \cup \{\infty\}$ and the presentation \bar{C} in the form of Riemann sphere is well-known. We give the second compactification plane C , which results in the circuit (S, ρ) which has a set of infinite points. We state that (S, ρ) is metrizable plane compactification C , if ρ - metric on S , S is compact, $(S \supset C)$ and C is an open subset S . Let (S, ρ) compactification C with a metric ρ . A lot of such compactifications can be found in [1]. Another metric compactification is defined in [2] and is built in the following way: let us consider the reflection

$$\phi: \mathbb{C} \rightarrow D = \{\lambda \in \mathbb{C} : |\lambda| < 1\}, \quad z \mapsto z/(1 + |z|)$$

which is homeomorphism: compactification of the image D reflection $\phi \in \bar{D}$, locking D , with the usual metric. This leads to the next compactification C .

$$S_1 := \mathbb{C} \cup \{\infty e^{i\vartheta} : 0 \leq \vartheta \leq 2\pi\}$$

With the metric d defined by the formulas:

$$d(z, w) = \left| \frac{z}{1 + |z|} - \frac{w}{1 + |w|} \right|, \text{ if } z, w \in \mathbb{C};$$

$$d(z, \infty e^{i\vartheta}) = \left| \frac{1}{1 + |z|} - e^{i\vartheta} \right|, \text{ if } z \in \mathbb{C}$$

$$d(\infty e^{i\vartheta}, \infty e^{i\varphi}) = \left| e^{i\vartheta} - e^{i\varphi} \right|, \text{ if } \vartheta, \varphi \in \mathbb{C}$$

We see that this compactification leads to the set of infinite points in the form $\infty e^{i\vartheta}$, where $\vartheta \in R$.

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FEATURES OF NON-VERBAL COMMUNICATION IN DIFFERENT COUNTRIES OF THE WORLD

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Our life is communication. In communication, a great role is played not only by words but also by non-verbal communication-our gestures, facial expressions, body postures and emotions, which help to convey information to the interlocutor more accurately and clearly. Australian writer Alan Pis believed that only 7% of the information was transmitted using words, 38% - with the help of intonation, voice tone, etc. and 55% by poses. But often the same gestures may have different meaning in different countries. Therefore, in order not to get into an awkward position, it is worth exploring the most commonly used gestures.

If we want to express our enthusiasm and show that we like a certain thing, then we raise the thumb up. This gesture is understood by all and is used quite often, but in terms of the Czech Republic, Denmark and the Netherlands, the raised toe is considered to be a serious insult of another person.

Even politicians find themselves in an awkward position, not knowing the rules of non-verbal communication. So Winston Churchill was often unintentionally showing the sign "V", turning his hand back to people. But this sign means "victory" only when the palm is returned to the interlocutor, otherwise this gesture becomes offensive.

In some countries, you may even be sued for improper and inappropriate use of gesture. So in Germany a police officer filed a lawsuit against the driver, who showed him the sign "OK" -closed together the thumb and index finger. The law-guard took this gesture as offensive. But despite this, the judge justified the driver, arguing that the sign "OK" has a double meaning. The point is that in the English-speaking countries this gesture means "okay ", and in France and Germany "full zero." It is better not to use this gesture at all in Tunisia, because it means the intention to kill another person.

Therefore, in order to find a common language with representatives of other countries, it is very important to understand the meaning of their non-verbal communication, because even if the language is fluent, a bad gesture can spoil the whole conversation.

ROBOTIC SURGERY

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In our world, many people suffer from a variety of diseases. Unfortunately, many illnesses lead to the death of the patient. According to the world statistics of human diseases, the 4 most common non-infectious diseases are distinguished – heart disease, cancer, lung disease and diabetes. Robotic surgery is one of the most important breakthrough in the treatment of diseases (namely, heart disease).

Robotic heart surgery or cardiac surgery is a type of cardiac surgery with minimal risk by the heart surgeon. The surgeon uses a specially designed computer device to control surgical instruments such as scalpels, clips and others.

Thanks to this technology, surgeons perform heart surgery, make smaller cuts and perform work more accurately, and thus treatment becomes more effective.

There are types of robotic operations of the heart: repair of mitral valve (with mitral valve prolapse), tricuspid valve repair, defective atrial septum (ASD), closure of the oval openings in the atrium septum (usually this pathology is present in newborns), removal of cardiac tumors (myxoma, fibroelastoma).

Another good thing about robotic surgery is that it provides risk reduction during surgery, smaller cuts with minimal scars, duration of stay in the hospital under the supervision of doctors (usually 3 to 4 days), reducing the use of analgesics and antibiotics, reducing the risk of infection. Master of managements allow the surgeon to manipulate instruments, turning the natural hand and wrist the surgeon's movements into relevant, precise and large-scale instrument movements.

In conclusion, it should be said that robotic surgery is a major breakthrough in the history of medicine and the development of humanity as a whole. It is not possible to assume that in a few decades, all medicine will be robotized. As a result, it may reduce the risk of false diagnoses and death of patients.

CONSTRUCTIONAL FEATURES OF BRANCH PIPES AND THEIR INFLUENCE ON ENERGY EFFICIENCY OF THE PUMP UNITS

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As experimental investigations have shown, a considerable part of the losses occurs in motionless elements of a flowing part of pumps. Loss in motionless elements can also be explained by the narrower range of economic functioning of the pump in general, in comparison with the range of economic functioning of an impeller. Thus, the flowing part of pipe canals of pump branch pipes are of considerable interest for research [1].

The centrifugal pumps are made with spiral, circular, impeller and complex branch pipes.

Spiral branch pipes occur more frequently in D type pumps. In a spiral branch pipe kinetic energy at the input of the impeller turns into static pressure with minimal losses. A spiral branch pipe of a single-stage pump consists of a spiral chamber and a diffuser. Spiral branch pipe should provide optimal pump operation and match the design value of the pipelines' spiral capacity.

The results of researches [1] show that the characteristic of N-Q practically does not depend on the parameters of drainage. The power consumed in different modes depends mainly on the size, design and geometry of the flowing part of the impeller (for $n = \text{const}$).

It is difficult to estimate precisely the loss in the withdrawal, as the work of the wheel and the drive are interrelated and additional losses may arise due to the discrepancy between the calculation modes of the wheel and the drive.

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DISTRIBUTED DENIAL OF SERVICE ATTACK

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Distributed Denial of Service Attack (DDoS-attack) is an attack to site. The main purpose of this attack is to put the site out of service providing more false requests. As a result the servers which maintain the site will serve the excessive volume of false requests and the site becomes inaccessible for ordinary user.

Unlike other kinds of cyber attacks, DDoS assaults do not attempt to breach your security perimeter. Rather, they aim to make your website and servers unavailable to legitimate users. DDoS can also be used as a smokescreen for other malicious activities and take down security appliances, breaching the target's security perimeter.

DDoS-attacks were complained in 1996. However, attention to the problem arose only at the end of 1999, when almost simultaneously the Web services of the world's largest corporations were disabled.

Typically, an attack is organized using Trojans. It infects insufficiently protected computers of ordinary users. Trojans cannot behave themselves on an infected computer, waiting for a command from their host. A computer may be exposed to such an attack when visiting various infected sites, receiving mail or installing unlicensed software. When an attacker intends to launch an attack, he gives a command, and all previously infected computers begin simultaneously send requests to the victim site.

Popular victims of such attacks are commercial and information sites. Hackers have recently used this type of attack to demand money to unlock the site.

So, it is quite difficult to carry out this type of attack. As a rule, protection includes such activities as filtering and blackholing, eliminating server vulnerabilities and increasing resources.

SOCIAL FACTORS THAT INFLUENCE THE ADAPTATION OF INTERNATIONAL STUDENTS IN UKRAINE

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International cooperation in education is becoming more widespread in Ukraine. According to our survey held among the international students studying at Sumy State University 75% are from India, 16,7 – Nigeria, the rest are from Kenya, Bangladesh, etc. Their most important goal is to get the desired higher education, which is either not provided by their native countries or has the facilities and conditions that don't satisfy them. The analysis of the frequency of communication between Ukrainian students and international students revealed that 52.6% of students did not communicate with foreign students at all, 23.8% talk once a month, 12.4% – once a week, and 11.2% – every day. To compare let's consider the data from the study conducted three and a half years ago. Then the students responded to this question as follows: 48.6% of respondents indicated that they communicated occasionally; 37.4% indicated that they did not communicate with foreigners at all, only 7.5% talked once a week and 6.2% – every day [1, p.89]. So, we see that the proportion of people who communicate with foreigners is increasing. This is an important factor, as the frequency of communication determines the attitude to foreigners [2]. On the threshold of a new country foreigners face new challenges. The most important and complex of them is adaptation. Adaptation is the process of adjusting to new conditions. This topic is very relevant for Sumy, because at Sumy State University the majority of students are foreigners. The process of adaptation is a habitual and natural phenomenon for any person who has appears in a new, not known environment. But everyone sees different ways of adapting to new conditions. According to the results of our polls, 91.7% of the respondents quickly adapted to our country, but we have 8.3% who require serious consideration.

Let's start with the fact that when a person is in a new, unusual environment, he may begin to panic. There is a feeling of discomfort, fear, alienation. Taking into account the different level of

conditions, the different mentality of the countries, it is not so easy to adapt. To get used to a new city completely, it takes time and conscious perception of another society. The goal is to understand all the intricacies, features, to investigate the threats, to see certain advantages and opportunities that this country may give. The main factors that will influence the ways of adaptation are:

1. Individual features (if a person is purposeful, determined or, conversely, uncertain and confused).
2. Age and gender also affect that because women are much more adaptable to new changes, and with age, the view on certain things is changing.
3. How prepared a foreigner is to the visit to a new country. Being informed means being ready.
4. Student motives. It is possible that some foreigners do not aim to achieve any success in learning, so they do not try to fully adapt and refuse to change themselves for the sake of living in another country.
5. The level of support (the presence of similar peoples and different nationalities among international students is preferable in the process of adaptation, it becomes a "group adaptation" that simplifies the situation).

According to our studies of the methods of adaptation, we suggest distinguishing three types of foreigners:

- a socially active one;
- independent sociophobe;
- phlegmatic standard.

The easiest adaptation is given to foreigners who belong to the third type. We characterize them as follows: students who have easy attitude to living in another country through invisible existence in the society. They have a problem with self-organization, that is, being passive is a good way to avoid stress, they do not seek new impressions, emotions and acquaintances. This behavior is spread among students who are representatives of the following countries: India, China, the people from Africa, and sometimes even Ukrainian students tend to take up such behavior.

The most productive and most effective way of adaptation is for those who are socially active. They win this struggle through

active intervention in all spheres of life of the new world. These people seek to win, they love to be at the center of attention and adapt through direct communication with the outside world. They are not afraid to show themselves, try to be involved in solving various problems. The difficulties are not a trial for them, but a chance to assert themselves as a new personality in the new society. Among such students there are usually the representatives of Germany, Turkey, and the United Kingdom.

As for independent-sociophobes, an interesting situation arises here. Because this type of foreigners, unfortunately, prevails in our environment. They chose the hardest way to adapt. They have fears that may prevent them from being engaged into active communication. The most important issue here is the problem of communication. Living in the modern world is not easy, but people should always understand that communication is the bridge that helps us try to cross the river, no matter how deep it may be. Independent-sociophobes become their own victims. They behave like being in a room with thousands of mirrors to feel themselves not alone and, at the same time, are afraid to go out into the world. This was the problem we faced while interviewing foreigners, there were few of them who wanted to express their feelings and thoughts.

As we can see the representatives of all types are both special and amazing, but they are not judged for that, because only they know how to position themselves in society better to make life easy and carefree. Each of them will face challenges, and each will seek its own solution.

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ADVANTAGES OF FREE-VORTEX PUMPS USE

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There is often a need for hydrotransport of mixtures containing solid and fibrous inclusions, abrasive and easily damaging substances, suspensions, gas-containing liquids, etc. For effective hydrotransport of such substances, pumps with new design solutions have been developed, free-vortex pumps. The main feature of these pumps is the free space between the front wall of the body and the impeller located in the body niche. The first free-vortex pump was a "Wemco" pump which was designed in the USA. The impeller of this pump is made by the type of a hydraulic coupling wheel. The disadvantage of this type of free-vortex pumps is low efficiency which is 30-40%.

To raise the efficiency, the design of the free-vortex pump was improved. The studies conducted abroad led to creation of the constructive schemes "Turo" ("E.Egger", Switzerland) and "Seka" ("E.Vogel", Austria). The efficiency coefficients of these pumps were raised to 54 - 56% respectively.

In Europe and the CIS countries, “Turo” pumps are mainly used which have the highest level of efficiency for this type of pumps. Despite this, in the United States a large number of “Wemco” pumps are produced and operated which have lower efficiency. Being more deeply analyzed and compared with other types of free-vortex pumps, the "Wemco" pumps have a number of advantages:

- a special shape of the flow part ensures unimpeded passage and minimal damage of solid inclusions in the pumped medium, the bulk of which does not come into contact with the impeller;

- a simple form of the impeller is well covered with protective lining rubber or plastic when pumping abrasive media;

- reliable work in transportation of polymers, latex and viscose raw materials, as well as saturated chemical solutions prone to crystallization;

- pumps are indispensable at pumping stations when pumping fecal liquids, wastewater and sewage sludge.

INNOVATIONS IN BIOTECHNOLOGY: EDITING THE GENOME

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Medicine is the area that should grow every year, because human diseases increasingly embrace our body and become more resistant to various methods of treatment. Biotechnology is gaining popularity and relevance in our time. More than 3000 genetic diseases are caused by a single replacement in DNA. The genome editing technology CRISPR is gaining more and more popularity and attention to itself. In other words, CRISPR is a database of bacteria about contacts with viruses.

Cas9 is very accurate, like a surgeon. CRISPR allows to turn on and off the genes of living cells and study specific DNA sequences. The Cas9 protein performs the function of removing a foreign part. But they are limited to one patient and will die with him if the scientists do not use them on reproductive cells. Unknown errors can occur in any part of the DNA and be unnoticed.

How does the protein work? The virus inserts its genetic code into the bacterium. It resists the virus and activates their antivirus system. They save some of the DNA of the virus in their genetic code. When the virus attacks again, the bacterium creates an RNA copy and forms the Cas9 protein. It scans the bacterium for virus interference. When it is a 100% conformity, it activates and cuts the DNA of the virus.

In 2015, scientists used CRISPR to remove the HIV virus from patients' cells and proved that it was possible. A year later they conducted another experiment with rats. The HIV virus was found in all of their cells. The scientists injected CRISPR into their tails, and were able to remove more than 50% of the virus from the cells throughout the body.

Thus, innovative developments reduce the cost of treatment. CRISPR gives us the means to edit our immune cells and make them the best killer for cancer cells. The technology CRISPR / Cas9 is able to change the attitude of mankind to hereditary diseases.

SOME SLANG EXAMPLES OF REAL LIFE ENGLISH

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First of all, what is the meaning of slang? According to Cambridge Dictionary, slang is very informal language that is usually spoken rather than written, used especially by particular groups of people. So, it's not usually taught within formal English course at schools or universities. But you'll hear it everywhere when you communicate with native speakers. This can be called “real life” English because it's a vital element of everyday communication, without which you don't understand the foreigners.

The purpose of our research is to find out some slang expressions in order to be "in the subject". Here are some of the most common slang terms, which will help us to improve our English and not to feel embarrassed while traveling abroad:

Bee's knees describes something excellent. “It was the bee's knees,” we might say in response to being asked how your delicious lunch was. We could also use it to describe someone who is selfish: “He thinks he's the bee's knees.”

The abbreviation “*DIY*” stands for “*Do It Yourself*”, and it tends to refer to home improvements. Thus a shop selling items for home improvers can be known as a “DIY shop”. You may hear the abbreviation in certain other contexts, though less frequently: a “DIY meal planner”, for instance.

When someone has “*lost the plot*”, it essentially means that they've gone mad, or that they have no idea what's going on. It's something you might say about yourself on classes (“I thought I'd lost the plot”).

Not fussed means “not bothered” or “I don't mind”. You can say “I'm not fussed” to indicate that you don't have a preference.

Killing me does not mean to be taken literally. When someone says that something is “killing them”, it normally means “really hurting”.

The word “*mobile*” refers to the ability to move (“she's less mobile since the accident”), and to a decorative object hanging from the ceiling, but it also refers to the mobile phone, so if you hear someone

refer to their “mobile”, that’s what they’re talking about. The equivalent word for “mobile” in America is “cell”.

The term “*bits and bobs*” refers to a collection of small things, as does its variant, “bits and pieces”: “I’m going into town to do some bits and pieces of shopping” or “She brought me over some bits and bobs to keep me entertained – magazines, DVDs and suchlike”

While the word “*gutted*” literally refers to something that has had its guts removed (a “gutted fish”, for example) or to the past tense of the verb “to gut” meaning to remove the guts, it’s also a way to describe feelings of devastation. “I’m absolutely gutted that we lost”, for example.

The word “*chuffed*” signifies that you’re really pleased about something: “I’m so chuffed at your news”. It’s also found in the expression “chuffed to bits”, which means the same thing.

Stuffed means to be full of food to the point at which you can eat no more. As in, “I don’t think I can manage dessert, I’m stuffed.” Another similar expression is “fit to burst”, which means the same thing.

In the conclusion we should not forget that slang is informal language which can be used by particular groups with the same interests. Young people spread out slang expression more often. When such new expression is known and used by a large majority of people, it becomes a part of regular language and usage. As online translator doesn’t include slang words and expressions, we will find their explanations only in specialized dictionaries.

For more information, pay a visit to the websites:

1. <https://www.adme.ru/zhizn-nauka/150-vyrazhenij-iz-anglijskogo-slenga-903760/>
2. <https://dictionary.cambridge.org/ru>

BUILDING INFORMATION MODELING OF COMPLEX TECHNICAL OBJECTS IN ENGINEERING COMPANIES

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N.V. Maliovana– E L Adviser

The BIM (Building Information Modeling) technology involves building one or more accurate virtual building models in a digital form. The use of models facilitates the design process at all its stages, providing more thorough analysis and control. Being completed, these computer models contain the exact geometry of the structure and all the necessary data for the procurement of materials, construction and construction work.

In modern conditions of design and construction or infrastructure activities, it is practically impossible to efficiently process the old means of dealing with us with a huge information for thought, "which outstrips and accompanies work with" man-created objects. This information is "challenge" of the world around us demanded a serious response from the intellectual and technical community in response. The conceptual form of constructing information modeling, initially arising in the project environment and receiving a wide and quite successful practical application in the creation new objects, however this fear quickly surpassed the framework established for it, and now information modeling of buildings means much more, than just a new design method. Conceptual form of BIM is shown in Figure 1

Using BIM-technologies allows you to reduce construction costs by an average of 10-30% of the budget. At the same time, the timing of construction and installation work can be reduced by 10%. Planning of the budget for construction, based on information modeling, has 4 times less errors than with traditional design. BIM-design allows you to save from 20% to 50% of the time spent on project development. Changes are made 3-5 times faster, and physical and intellectual intersections between different project disciplines (collisions) are absent.

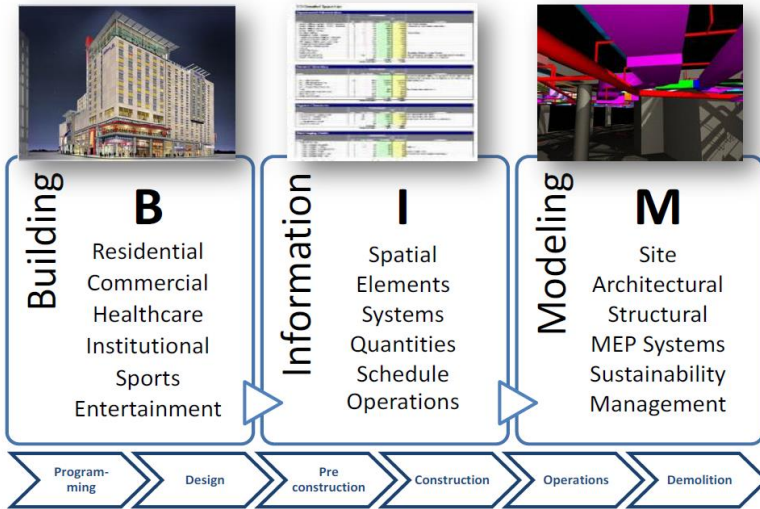


Figure 1 – Visualization of BIM Concept

BIM programs automatically detect at the design stage even minor flaws, while classical CAD-methods disclose them only in the midst of working on a new house or at the time of its settling. Unforeseen expenses are minimized. Experts see the changes that their colleagues make, take note of them, monitor how the new parameters affected their control zone. With one building can work not only people of different professions, but also several companies at once. This is very convenient if a large city project or network trading facilities is planned.

Talented designers work with a three-dimensional model of an object associated with a certain information database. Manually changing any project parameters will undoubtedly help to automatically change all other components that are closely related to each other. All kinds of drawings, visualizations and specifications - all this is the result of working with bi-technology, which plays the role of a significant attribute of successful and highly efficient construction.

INNOVATIONS IN TRAUMATOLOGY

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Today humanity is fighting many diseases (infectious, bacterial, industrial and others). Every day many scientists invent new kinds of treatment for diseases.

In particular: creation of artificial organs (heart, kidney, liver, pancreas and others), development of new vaccines and medications, regeneration of tissues and organs of the body.

I am particularly interested in inventions in traumatology because I think that every person can have traumas throughout life. Treating fractures is the biggest problem in traumatology, since the repair can take a long time. Moreover, all the time the patient feels pain or discomfort. Therefore, scientists develop new treatments for fractures. I have found some interesting inventions in traumatology:

- Ukrainian scientists invented special gel. This gel is based on the patient's own blood. It has been proved that the gel helps bones grow together twice as fast. Also, with complex fractures, conservative methods are useless and replaced by minimally invasive operations. The method consists in that the doctor makes punctures and through them delivers the substance to a fracture. In this connection, the patient receives fewer injuries. The process is monitored by the doctor by translating the image onto the monitor. When using this method, complex fractures heal at times faster.

- Scientists from Israel have developed a special membrane to speed up the treatment of fractures. This membrane is implanted into the patient. Its feature is the ability to resorption with time.

In my opinion, this progress in traumatology has a positive impact on all people. In addition, it would be very good if medicine could combine the accessibility and effectiveness. The main problem is that many people cannot afford such treatment. I hope that in the nearest future, medicine will make big steps forward.

CURRENT PROBLEMS OF SOFTWARE QUALITY ASSURANCE

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EL Adviser O.R.Gladchenko

More and more applications depend on the reliability of software systems. Due to the increase of complexity of the software, creating quality systems has become a major challenge for quality assurance (QA) engineers and testers.

Quality assurance and testing are complicated processes involving many interconnected activities. Rapidly evolving technology including mobile applications and devices, cloud solutions, and big data not only add complexity, but also significantly increase scope. Adding in the introduction of agile and continuous delivery methodologies makes high demands not only on the technical skills of QA engineers but also on the communication skills and team work.

There are just few examples of what problems QA engineers facing nowadays:

- Developers not trusting that the quality assurance engineers know what they are doing.
- Acceptance criteria/expectations are not very clear.
- Processes are often loosely followed, which puts a lot of the burden on the quality assurance team to find all the issues prior to a release.
- Quality assurance is often regarded as just testing and their opinions are often disregarded or ignored.
- Lack of understanding from various levels of an organization as to what are realistic expectations from QA.
- QA is the last line of defense and this is always QA team's fault when a major defect occurs.

The worst problem that QA team can encounter is when there is a communication gap between developers and QA. The defects may start bouncing between developers and QA, because there is not common understanding what is a bug and what is not, or because either side wants to prove they are right. Unfortunately, it happens more often than it should. The only solution for this problem is collaborative software development in which all members of the team are responsible for quality.

Following this simple and at the same time important principle will help not only improve performance of QA team, save time and resources, but also significantly increase overall quality of the final product.

THE SIXTH MASS EXTINCTION ON THE EARTH

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A biological annihilation of wildlife in recent decades means that the sixth mass extinction in Earth's history is under way. Billions of regional and local populations have been lost. This will obviously have serious ecological, economic and social consequences.

Wildlife is dying out due to certain reasons.

It's likely that the extinction of many species on the earth was caused by asteroid strikes. For example the disappearance of the dinosaurs 65 million years ago.

Even some climate changes like falling temperatures by 20-30 degrees Fahrenheit also poses a constant danger to animals and plants.

Lack of genetic diversity, starvation, loss of habitat make the groundwork for origin of lethal viruses and diseases which currently wipe out populations of amphibians.

Most animals require a certain amount of territory where they can hunt and breed. As human civilization expands increasingly, these natural habitats diminish in scope – this in fact causes extinction of species living in these areas.

Once a species starts cutting down in numbers, there is often a lack of genetic diversity. Consequently, populations run the risk of “inbreeding” undesirable genetic traits and illnesses.

Another reason of annihilation of species is “better adapted” competition. It means that only “better adapted” to living conditions species will survive.

Mass extinction is also caused by lack of food. Starvation is the one-way route to susceptibility to diseases and death.

Many animals can suffer from traces of toxic chemicals, caused by industrial pollution. Constant exposure to pollution can render wildlife more sensitive to the other dangers mentioned here.

Surely, we should not forget about humans’ impact on the environment. We have wreaked plenty of ecological damage for a short period of time: elimination of the Dodo Bird and Passenger Pigeon, decreasing the number of whales and other marine mammals.

Ukraine also faces problems of some animals and plants extinction. For example, in 1955 in order to encourage livestock, the government launched a campaign to reduce wolf numbers by intensive hunting and use of poison. Nowadays the wolf population increases slowly and is considered endangered.

A single species’ disappearance can, in fact, cause huge changes on a global scale. The living web, like a tapestry, is held together not by glue, but by interdependence – one strand stays in place because it is entwined with many others. Losing even a single species acts like domino, influencing the entire ecosystem.

That is why we should stop our reckless behavior and take care of our planet with all living things on it.

ESSENTIAL INFORMATION ABOUT STROKE

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According to WHO, strokes are the second leading cause of death and third leading cause of disability. Strokes are more common in low- and middle-income countries. They mainly affect individuals on peak of their productive life. Because of that strokes have an enormous impact on countries' productive life. Every year about 400 thousand people suffer from stroke. It equates approximately one person having stroke every 40 seconds.

Stroke is a medical condition characterized with lack of blood supply to brain cells which leads to their death. It is more likely to affect people if they have the following risk factors: being overweight, age of 55 or older, a family history of stroke, inactive and unhealthy lifestyle. There are two main types of stroke based on its origin: ischemic and hemorrhagic. Sometimes ministroke or transient ischemic attack is considered as a separate type of stroke.

Ischemic stroke happens because of interruption of the blood flow. There are several reasons of this type of stroke but the main are atherosclerosis, blood clots blocking arteries and compression of the vessels.

Haemorrhagic stroke is caused by arteries' ruptures. Leaked blood puts pressure on brain cells and damages them and also reduces blood supply. The ruptures can be caused by hypertension, trauma, blood-thinning medications and aneurysms. Aneurysm is a weakness in a blood vessel's wall.

The symptoms of a stroke are quite easy to notice. They are confusion, troubled speaking and understanding, a headache, possibly followed by vomiting, altered consciousness, numbness or inability to move parts of the face or extremities, particularly on one side of the body, vision problems in one or both eyes, troubled walking, including dizziness and lack of coordination.

You need to call a doctor immediately if you notice such signs because stroke is an emergency medical condition.

THE PSYCHOLOGICAL ASPECTS OF MANIPULATION

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The topicality of the problems investigated in the research is derived from the daily needs of each person, namely a comfortable existence in the modern society, closely associated with the characteristics, habits of the group, in which he/she lives and socializes. Knowledge of the behavior of society and the ability to recognize and prevent the development of events give you the opportunity to feel comfortable in the group or other social groups, avoiding conflict situations.

Mental manipulation components, the characteristics of the consciousness and subconsciousness of the person in interaction, were developed in the works by S. Freud, G. Leon, V. Bekhterev, K.-G. Jung, and other classics of psychology.

Since the 90-ies, the number of publications on the subject of psychological impact grows like an avalanche. Nowadays among the most well-known scientists who have studied the issues of manipulative influence, are: A. Dotsenko, A. Sydorenko, G. Grachev, I. Miller, T. Kabachenko, E. Bern, B. Bessonov, A. Vagin, G. Kovalev, V. Krysko, V. Kulikov, N. Koval, S. Povarnyn, V. Pankratov, G. Pocheptsov, D. Ramendyk, V. Sagatovsky, V. Sheinov, R. Cialdini and others.

The problem of manipulation regarded in various research works. If the Soviet specialists mainly focused on political and ideological aspects, the Western scholars emphasized the impact of manipulating the moral and intellectual attitude of people.

According to J. Ortega y Gasset, the phenomenon of «manipulation» is in a fatal need of spiritual dictatorship. Without any spiritual power, without any manipulating of public opinion and people, anarchy would be dominated in society and it would have

caused its collapse. Most people don't have their opinion, said the philosopher. In his opinion, the modern «mass man» does not know how to think and doesn't want to do, and it confirms the historical development. That is to say that the gift of freedom for many people is too complicated, and there is a desire to give it to someone who takes responsibility for his / her actions and deeds.

For the peculiarities of perception interlocutors can be divided into four types: auditory, visual, kinesthetic and digital (discrete). It all depends on which of the person's sensory systems is better developed: auditory, visual, kinetic or mental one. People unknowingly tries to use primarily the system that is better developed. Up to 5-7 years (sometimes up to 14) every person is able to perceive the world, using equally visual, auditory and kinetic systems. So children's memories of this period remain for life. In the future, every individual develops its redundant channel memories (visual, auditory, or kinetic), which determines the most developed form of perception.

Knowledge of the types of the individual's perception allows to use it to control them. Communicating in the system of perception is comfortable for a person , he/ she sets a stable communication channel with another person. In this case the recipient feels comfortable, feels pleasure from the fact that he/she is well understood, «as if they know each other all their life» and so on. All of this contributes to attraction (effective to attract attention), and then to hidden control. The person who is distressed or in a nervous situation, concentrates his/her worries on a particular system of perception. To relieve the state of the individual it is helpful to widen the perception of reality by downloading other channels. For example, you can hug the auditory person or just friendly touch, shake or take his/her hand, all this appeals to the kinetic perception, or vice versa, you can ask the kinesthetic person to listen to the song or the lyrics, the sound of the trees. In our research, we have tested

the theory in practice dividing people into groups by the way of perceiving the world to examine the results for further usage it in life to build the effective communication and calibrate the behavior in a subjective contact with the members of these groups. Because of the the small number of people who use discrete channels of perception, we have decided not taken them into account.

In Sumy State University, we conducted a survey among the 1st, 2nd and 3rd year students of the specialty «Translation». These were mostly girls. The number of all participants totaled: 96 students.

The survey results showed that most students who were surveyed visual (50%). Students with auditory perception system in the world are on the second place (29%) and the lowest proportion was accounted for kinesthetic system (21%).

From the received percentage ratios it is possible to conclude that the auditory system predominates the kinesthetic perception that, in turn, appears to be very interesting and unexpected result. It can be explained by the fact that survey was aimed at the students namely interpreters/translators because it takes them plenty of time studying languages, listening, learning new words and its correct pronunciation, – all this promotes the development of auditory perception system.

Thus as a result of the survey, we have proved again the true fact of the existence of theories about the division of people into groups by the type of perception of the world and the relevance its study, confirmed that generalization should be made not out of own conclusions but the specific situation characterizing his/her way of life. For being understood correctly and accurately it is necessary to find the approach for every individual and any group of people. All in all the most important is that learning and understanding of representative systems are only the first steps in the most effective communication.

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ОСНОВНІ ПРИНЦИПИ ПРОФЕСІЙНО-ОРІЄНТОВАНОГО НАВЧАННЯ ІНОЗЕМНОЇ МОВИ

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Навчання і вивчення іноземних мов у сучасному світі вимагає використання технологій швидкого оволодіння навичками комунікації іноземною мовою у професійному середовищі. Методи навчання професійно-орієнтованих курсів іноземної мови суттєво відрізняються від традиційних. Особливого значення набуває оволодіння навичками говоріння і розуміння іншомовного усного тексту, в той час, коли традиційні методи акцентували навчання письму, читанню, говорінню і аудіюванню. Такий підхід пояснюється тим, що у сфері професійного спілкування партнери зазвичай не мають справи з письмом і читанням у широкому масштабі. Ще один аспект, характерний для професійно-орієнтованих курсів іноземної мови це суттєве зменшення об'ємів вивчення граматики, оскільки навчання говорінню вимагає багато академічних годин. Граматика вивчається, але в значно меншому обсязі. Слухачі курсів, студенти можуть докладніше вивчити граматику на окремих курсах за індивідуальними потребами. Але найважливішим фактором навчання професійно-орієнтованих курсів іноземної мови є оволодіння вокабуляром, необхідним для спілкування в даній професійній області. Викладач іноземної мови ставить перед собою три питання, які є значимими для курсу: що, скільки і як навчати. Що – викладач забезпечує курс матеріалами, які не лише потрібні, але і цікаві для вивчення студентам. Скільки – тенденція майже у всіх викладачів однакова – дати якомога більше матеріалу для засвоєння, але результат передбачає не кількість засвоєних виразів, а кількість ситуацій, в яких студент зможе їх використати. Як – викладач використовує різноманітні види діяльності для розвитку комунікативних навичок: дискусії, рольові ігри, діалогічне мовлення, обговорення за круглим столом, міні конференції, монологи та ін. При такому підході студенти і викладачі досить швидко і результативно досягають поставленої мети.

ПСИХОЛОГО-ПЕДАГОГІЧНІ ПРИНЦИПИ НАВЧАННЯ СПІЛКУВАННЮ ІНОЗЕМНОЮ МОВОЮ

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У процесі інтенсивного навчання студентів іноземної мови варто зважувати як на засадні психолого-педагогічні принципи активізації навчальної діяльності студентів, так і на максимальне використання творчого та інтелектуального потенціалу, що досягається за умови особливої взаємодії студентів у навчальній групі. При цьому процес навчання спілкування іноземною мовою має бути побудований з урахуванням психологічних механізмів, що лежать в основі формування, та закріплення складних комунікативних умінь і навичок та психологічних закономірностей організації міжособистісних стосунків у колективі. Це насамперед:

1. Свідоме й цілеспрямоване керування процесом спілкування в групі студентів шляхом підвищення творчої ролі викладача. Активність викладача в цьому разі спрямовано на забезпечення студентів потрібними знаннями, уміннями і навичками, на формування творчої самостійності особистості. Активність студентів групи відповідно спрямовано на прискорене засвоєння цих знань, умінь та навичок, виховання власної життєвої позиції, вдосконалення моральних рис особистості.

2. Організація засвоєння знань і формування вмінь і навичок у студентів через систему колективних дій, що сприяють мобілізації внутрішніх можливостей кожної особистості, а також ефективному використанню цих можливостей у навчальній діяльності. При цьому система специфічних ефективних взаємодій та особливих міжособистісних стосунків, що виникають у колективі, розкривають та актуалізують найкращі риси особистості, сприяє їхньому навчанню та розвитку.

3. Максимальне використання засобів впливу на психіку студентів (опора на слухове та зорове сприйняття, створення сприятливого емоційного клімату в аудиторії та ін.) із застосуванням індивідуального навчання через групове, що

дозволить студентові в процесі навчання вірно оцінювати свого співбесідника й відповідно до його індивідуальних особливостей будувати стратегію й тактику спілкування, обираючи для цього найпридатніші форми й засоби.

4. Тісна взаємодія викладача й студента, викладача й групи, бо їхнє співробітництво, їхні стосунки зумовлюють виникнення керованого ефекту групового навчання, який сприяє активізації психологічних можливостей студентів, виховує у них потребу в узгодженій спільній навчальній діяльності. За таких умов відбуватиметься формування групи як колективу. У зв'язку з цим варто виділити залежність ефективності методів активізації діяльності студентів від психологічного клімату в навчальному колективі, довірливих стосунків між викладачем і окремим студентом, від здатності викладача керувати аудиторією: мається на увазі врахування механізму мовного спілкування в процесі навчання, психологічних закономірностей організації міжособистісних стосунків у колективі.

Організація спільної творчої навчальної діяльності викладача та студентів утворюють тло, на якому, зрештою, виникає нове ставлення до предмета діяльності. Для того щоб викладач був здатний активно користуватися мотиваційними резервами, які є в особистості того, хто навчається, активізувати їх та актуалізувати стимули, закладені в колективі, йому варто потурбуватися про те, щоб якомога скоріше перетворити навчальну групу на колектив, бо, як наголошував ще А.С. Макаренко, формування й розвиток особистості посправжньому може проходити лише в колективі та через колектив. Відносини взаємодії та взаємозалежності викликають у студентів потребу не лише вірно зрозуміти вимоги, які висувають до них оточуючі й конкретна ситуація, а й вірно оцінити можливості й результати своєї діяльності.

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