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Table of Contents

Medical Sciences

IMPROVING THE SYSTEM FOR RETRAINING NURSING STAFF	5
<i>BIBINUR K. SYDYKOVA</i>	
<i>DARIGA S. SMAILOVA</i>	
<i>ZAITUNA A. KHISMETOVA</i>	
EVALUATION OF EPIDEMIOLOGICAL STUDIES OF MORBIDITY AND MORTALITY AND RESULTS OF COLORECTAL CANCER SCREENING	7
<i>ARMAN KHOZHAYEV</i>	
<i>GULMIRA YESSENBULATOVA</i>	
<i>VIKTORIYA YUN</i>	
<i>BAGILA ABDULLAEVA</i>	
<i>SABINA MASSIMOVA</i>	
<i>KULYASH BAYSEITOVA</i>	
<i>MARZHAN MUKHAMEDZHANOVA</i>	
<i>ARDAK TARPANBAIEVA</i>	
<i>BAYAN IMAMBEOVA</i>	
<i>ZHANGUL IMANBAYEVA</i>	

Economic Sciences

INTERNATIONALIZATION PROCESS TO GLOBAL MARKETS – A FIRM-BASED VIEW	12
<i>ARYSTANBEK AITKAZINOV</i>	
ESG RATING AS A FACTOR IN INCREASING THE COMPETITIVENESS OF COMPANIES	16
<i>MARYANA VALERIEVNA USPANOVA</i>	
<i>ZAURE ABILDINOVNA SALZHANOVA</i>	
DEVELOPMENT OF TOURISM INDUSTRY OF THE REPUBLIC OF MALDIVES	26
<i>MADINA KOZHAKHMETOVA</i>	

Agricultural Sciences

STORAGE CONDITIONS AND MYCOTOXINS	34
<i>T. AKHALADZE</i>	
<i>A. CHKUASELIA</i>	
<i>A. CHAGELISHVILIA</i>	
<i>M. KHUTSISHVILI-MAISURADZEA</i>	
YABANI HALDA AZƏRBAYCANDA YETİŞƏN ÇAŞIR BİTKİSİ (PRANGOS FERULACEAE L.) SAPLAQLARINDA MİNERAL TƏRKİBIN VƏ PEKTİNMETİLESTERAZA FERMENTİ AKTİVLİYİNİN KONSERVLƏŞDİRMƏDƏ İSTİFADƏ MƏQSƏDİLƏ ÖYRƏNİLMƏSİ	43
<i>QURBANOV NÜSRƏT HEYDƏR OĞLU</i>	
<i>TAGIYEV MƏRDAN MƏHƏRRƏM OĞLU</i>	
<i>QULUZADƏ NƏRMINƏ HƏMİL QIZI</i>	

Sociological Sciences

PROFESSIONAL SKILLS NEEDS' ASSESSMENT IN TOURISM AND HOSPITALITY SECTOR	52
<i>NINO KEKELIDZE</i>	
<i>NATALIE KVACHANTIRADZE</i>	

Philological Sciences

FRANSIZ DİLİNDƏ VASİTƏSİZ VƏ VASİTƏLİ NİTQİN İŞLƏNMƏ YOLLARI	69
<i>QASIMOVA AYTƏN FƏRMAN QIZI</i>	
ПРАГМАТИЧЕСКИЕ ОСОБЕННОСТИ АНГЛИЙСКИХ ГАЗЕТНЫХ ЗАГЛОВОК	73
<i>РАМИЛЯ ГУСЕЙНОВА ФАРМАН</i>	
ARTICLES AND TYPES OF ARTICLES	75
<i>QASIMOVA NIGAR AZAD QIZI</i>	

Pedagogical Sciences

SPECIFICITY OF THE DEVELOPMENT OF FOREIGN LANGUAGE COMMUNICATIVE COMPETENCE BASED ON THE METHOD OF DISCUSSION	80
<i>DAUYLBAYEVA AIGERIM</i>	
DEVELOPMENT OF STUDENTS' SOCIAL INTERACTION SKILLS IN ELT	90
<i>ABDURAKHIMOVA ZHULDYZAY</i>	
FORMATION OF PHONETIC SKILLS OF STUDENTS AT THE INITIAL STAGE OF EDUCATION	98
<i>LALA MUSAYEVA</i>	

Philosophical Sciences

КРИТИЧНИЙ НООАНАЛІЗ ЕПОХИ УКРАЇНСЬКИХ ГЕНІЇВ НА ПРИКЛАДІ ОСОБИСТОСТІ ПОЕТА-ПЕРЕКЛАДАЧА ГРИГОРІЯ ПОРФИРОВИЧА КОЧУРА	103
<i>КОРСАК КОСТЯНТИН ВІТАЛІЙОВИЧ</i>	

Chemical Sciences

SYNTHESIS AND STUDY OF GRAPHENE AND ITS DERIVATIVES FROM SOLID COMBUSTIBLE FOSSILS..... 115

*M.K. KAZANKAPOVA
B.T. YERMAGAMBET
A.M. KALENOVA
A.B.MALGAZHAROVA
G.K. MENDALIYEV*

Journalism

მეცნიერული პრიორიტეტების შესახებ (II): ქვანტური მექანიკის ზოგიერთი ფუნდამენტური პრინციპის
წინასწარგანჭვრეტა და განზოგადება მსოფლიო ლიტერატურაში 127

იროდონ ნარჩუაშვილი

Technical Sciences

ARTIFICIAL INTELLIGENCE IN CARDIOVASCULAR DISEASE DETECTION: A SUPERFICIAL OVERVIEW 130

*ZEINEL MOMYNKULOV
MEIRZHAN BAIKUYEKOV*

FORECASTING THE PRICES OF NEW HOUSES IN KAZAKHSTAN 140

AIBATYR KENZHEGALIYEV

Medical Sciences

IMPROVING THE SYSTEM FOR RETRAINING NURSING STAFF

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Abstract

Background: The Ministry of Health of the Republic of Kazakhstan (hereinafter - the Ministry of Health of the Republic of Kazakhstan) has identified the reform of nursing as one of the strategic goals for the future. The need for a highly qualified nursing workforce with globally recognized competencies was identified as the main goal. To achieve this goal, training of nurses at the level of higher and post-secondary education is necessary. At the same time, the health care system as a whole suffers from an imbalance of medical personnel, ineffective use of nursing personnel in practical health care. The real staff disparity between nursing staff and doctors is accompanied by interconnected negative trends: - an increase in the share of medical services in medical activities that do not require medical qualifications, but which are to be carried out by well-trained nursing staff; technical work that often does not require professional training.

Methods: In the Republic, the issues of introducing electronic primary forms of nursing documentation are relevant and should be considered as structuring nursing records / classification for nursing practice and as a strategy for improving the quality of patient care. In addition, the success of the implementation of the tasks in terms of the introduction of primary forms of nursing documentation in the Republic depends not only on the heads of nursing services, but also on the heads of medical organizations (chief doctors). Today, chief nurses / deputies for nursing work in an environment of deep contradictions, when in practice outdated stereotypical approaches to nursing staff prevail. In addition, the nurses are faced with the implementation of the Comprehensive Nursing Development Plan in the Republic of Kazakhstan until 2025.

Results: From June 1, 2019, within the framework of the contract between the Ministry of Health of the Republic of Kazakhstan and the ALE "Union of Medical Colleges" (hereinafter - the Contract), the implementation of activities of subproject 1.3 "Development and implementation of a new nursing service management system in practical health care organizations" of the Project "Social Medical insurance "" Development of the professional environment of nursing specialists and improvement of the nursing retraining system "" (hereinafter referred to as the Project).

- A monitoring visit by key experts to 31 pilot medical organizations in 7 regions of the Republic of Kazakhstan was organized and conducted in accordance with the order of the Minister of Health of the Republic of Kazakhstan No. 419 dated July 4, 2018 "On the implementation of a pilot project to introduce a new model of nursing service in health care organizations." Based on the results, clear recommendations were presented in the form of an analytical note, the implementation of which is mandatory.

Conclusions: The introduction of nursing documentation into pilot medical organizations makes it possible to systematize the work of nurses, following an agreed algorithm of actions. The expanded functionality of nurses will reduce the burden on the medical staff and be responsible for the nursing services provided.

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EVALUATION OF EPIDEMIOLOGICAL STUDIES OF MORBIDITY AND MORTALITY AND RESULTS OF COLORECTAL CANCER SCREENING

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Annotation: This scientific and analytical work presents regional rates of incidence and mortality from colorectal cancer, as well as a detailed methodology and results of screening for this pathology in our country. Clinical and organizational aspects of early diagnosis based on the method of active detection of this type of cancer in clinically asymptomatic patients are presented. The technology of two-stage screening and the subsequent routing of examined patients depending on the results of this type of preventive examination of the population are described in detail.

Key words: colorectal cancer, epidemiology, morbidity, mortality, screening, hemocult test, fecal occult blood test - FOBT, total colonoscopy.

The key concept of screening for colorectal cancer (CRC) is the detection of oncological pathology in the early stages, when the prognosis is most favorable and allows you to get the best long-term results of treatment. A preventive examination always has advantages over a diagnostic examination when symptoms of the disease are already present. At the same time, it is possible to detect not only CRC in the early stages, but also benign neoplasms of the colon - polyps with their simultaneous removal. Along with this, it must be understood that the main conditions for screening for CRC are the availability of trained personnel and a standardized approach to identifying the trait under study and evaluating the results. The methods used should be fairly simple, reliable and reproducible, and also have sufficient sensitivity and high specificity [1,2].

Colon cancer with a share of 5.2% (2020 - 5.5%) in the structure of oncopathology of both sexes of the population and women (4.9%) remained in 6th place in 2021, in men it fell from 5th to 6th place (5.5%). The incidence rate per 100 thousand of the population with cancer of this localization in the country in 2021 increased from 8.7 to 8.8 [3].

Above the average republican level, the incidence of colon cancer was noted in 11 regions: Kostanay - 15.9, Pavlodar - 15.3, Karaganda - 15.0, East Kazakhstan - 13.4, North Kazakhstan - 12.7, Akmola - 10, 2, West Kazakhstan - 10.1, Aktobe - 9.0 regions and years. Almaty - 12.1 and Nur-Sultan - 9.0. Least of all, colon cancer was noted in Turkestan - 2.7 per 100 thousand population, Kyzylorda - 4.6, Almaty - 4.7, Mangystau - 4.9, Zhambyl - 5.8 regions and Shymkent - 4.0.

Rectal cancer in the structure of malignant tumors of both sexes retains the 7th place in terms of rank with a specific gravity of 4.9% (2020 - 5.0%), but in men it has risen from 6th to 4th place, in women it is stable at 9th place. The incidence rate increased from 7.8 to 8.4 per 100,000 population. At the same time, a high incidence rate was registered in Pavlodar - 18.1 per 100 thousand population, Kostanay - 16.2, North Kazakhstan - 15.1, East Kazakhstan - 13.9, Akmola - 13.1, Karaganda - 11, 7, West Kazakhstan - 9.8 regions. Traditionally, a low incidence of rectal cancer is observed in Turkestan - 2.7, Mangystau - 2.8, Zhambyl - 5.1, Kyzylorda - 5.3, Almaty - 5.6, Atyrau - 6.3 regions and Shymkent - 5.0 per 100 thousand population [3].

Colon cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2021 dropped from 5th place to 6th, with a share of 5.0% (2020 - 5.4%). At the same time, the mortality rate in the country decreased from 4.1 to 3.6 per 100,000 population. Above the national average, mortality rates were noted in 9 regions: Zhambyl - 3.7, Akmola - 3.8, West Kazakhstan - 4.4, North Kazakhstan - 5.0, East Kazakhstan - 5.1, Karaganda - 5.6, Kostanay - 5.6, Pavlodar - 6.0 - the maximum result, regions and Almaty - 5.3 per 100 thousand population. Low rates of mortality from colon cancer were found in Turkestan - 1.7 (the best result), Almaty - 1.8, Atyrau - 1.8, Aktobe - 2.5, Mangistau - 2.6, Kyzylorda - 2.7 regions and gg. Shymkent - 2.4 and Nur-Sultan - 2.7 per 100 thousand population.

Rectal cancer in the structure of causes of death in the population of both sexes in 2021 rose from 6th to 5th place with a share of 5.4% (2020 - 5.22%). In general, the death rate from this form of cancer in the republic was 3.9 per 100,000 people. A high mortality rate was recorded in East Kazakhstan - 8.6 (maximum level), Pavlodar - 7.6, Akmola - 5.3, Karaganda - 5.2, Kostanay - 4.9, North Kazakhstan - 4.3 regions and Almaty city - 4.3 per 100 thousand population. Below the average republican level, mortality rates from this pathology were ascertained per 100 thousand of the population in Mangistau - 1.2 (the lowest indicator), Turkestan - 1.6, Kyzylorda - 2.1, Almaty - 2.6, Zhambyl - 2.7, Atyrau - 3.4 regions and Shymkent - 2.1 [3].

Screening of CRC screening is the systematic use of screening studies in an asymptomatic population. The purpose of screening is to identify people with abnormalities suggestive of CRC. These persons in the future need additional examination to clarify the diagnosis. Opportunistic screening is the non-systematic use of screening tests in routine medical practice. A screening program is much more challenging than an early detection program. At the same time, the success

of the screening program is largely determined by the awareness of the population and medical workers about the possibilities of early diagnosis of CRC. The feasibility of a screening program is determined by several factors that relate to the disease being screened, the screening test, the characteristics of the population, and the characteristics of the healthcare system.

The first factor is that the disease must be well understood, common enough in the target population to justify screening, have a recognizable early stage; treatment of the disease at an early stage should be more effective than at a later stage.

The second is that the test should be characterized by sufficient sensitivity, i.e. the ability to detect cancer among people with the disease; sufficient specificity - the probability that among people who do not have a disease, the test result will be negative; have a high positive predictive value (positive predictive value) or, in other words, the likelihood that people with a positive test result have the disease; have a high predictive value of a negative result (negative predictive value), i.e. the likelihood that people with a negative test result do not have the disease; security; low cost; and acceptability - the likelihood that people for whom this test is intended will agree to the examination (which to some extent depends on the awareness of the population about the possibilities and importance of early diagnosis).

The third factor is that the healthcare system should be ready for maximum screening test coverage of the target group, have the resources to confirm the diagnosis, appropriate treatment and follow-up of people with positive test results, and regularly conduct screening tests at regular intervals. At the same time, the benefits of screening must outweigh the potential physical and psychological harm and justify the financial costs of its implementation [4].

The factors most significant for the development of CRC are:

- the presence of chronic inflammatory bowel diseases, adenomatous polyps, cancer of other localization, etc.;
- family history (presence of one or two first-degree relatives with CRC or familial diffuse intestinal polyposis);
- the age of men and women over 50 years old, taking into account the fact that more than 90% of patients with colorectal cancer are people of this age (medium risk).

Age, regardless of gender, is an important risk factor for CRC. After the age of 50, the incidence of CRC increases from 8 to 160 per 100,000 population. Thus, people who have reached the age of 50, even in the absence of symptoms, constitute a moderate risk group for CRC.

The second category of increased risk of CRC (20%) is made up of persons with a genetic and family predisposition, suffering from chronic inflammatory bowel diseases, diffuse familial polyposis.

The high-risk CRC group is determined by the so-called Amsterdam criteria (the presence of malignant tumors in two generations, the presence of cancer in a first-line relative under the age of 50 years), in this case, CRC screening should be carried out after the age of 30 years [5].

The degree of individual risk of developing CRC is determined before screening to select the scope of studies and the frequency of their conduct.

The interval for oncological colorectal screening is 1 time in 2 years, target group: men and women aged 50-70 years, with the exception of persons registered at the dispensary for CRC and colon polyposis. At the same time, when forming the target group, one should take into account the absence of severe concomitant diseases, such as the presence of a common malignant neoplasm, cerebrovascular diseases in the stage of decompensation, chronic obstructive pulmonary disease with respiratory failure, cirrhosis of the liver, myocardial infarction with congestive heart failure, diabetes mellitus with vascular complications. and others, which are highly likely to lead to death in the next 10 years.

The first step in screening for CRC is the fecal occult blood test (FOBT). Traditionally, such methods include a benzidine test for occult blood in the feces. This is a biochemical method based

on the assessment of pseudoperoxidase activity of hemoglobin. There is ample evidence that invitation to guaiac FOBT screening (gFOBT) reduces CRC mortality by approximately 15% in age-matched average-risk populations.

To ensure the effectiveness of screening with gFOBT, the interval for screening under the national screening program should not exceed two years. To date, there is an immunochemical FOBT method - iFOBT, which is superior in efficiency to gFOBT in terms of the probability of detecting adenoma and cancer. iFOBT has improved analysis performance compared to gFOBT.

Immunochemical (immunochromatographic) examination of feces for occult blood - iFOBT or hemocult test is carried out for all men and women of the target group using an express method, which allows you to get a result within 3-5 minutes, without the participation of a medical worker. However, the evaluation of the test is carried out only by a medical worker in the PHC preventive department.

With a positive analysis of feces for occult blood, the second stage of colorectal screening is performed, which consists in endoscopic examination of the colon - total colonoscopy [6]. At the same time, in this case, this medical manipulation is of a therapeutic and diagnostic nature, since it allows one-stage removal of adenomatous polyps, which, according to various authors, occur in every third subject after 50 years of age. At the same time, women have 20% fewer polyps than men, but they have more right-sided lesions, which are more difficult to detect using fecal blood tests, because they are less traumatic [6,7].

Now, regarding the results of CRC screening. In 2021, despite the difficult epidemiological situation in the country, 920,640 men and women of the target group from 50 to 70 years old were examined during colorectal screening (971,450 in 2020) [3].

According to the results of colorectal screening, 211 cases of colon and rectal cancer were detected in 2021, which is 24 cases more than in the previous year - 187 cases. The detection rate increased from 0.19 to 0.23 per 1000 examined patients.

The low detection rate of CRC was noted mainly in regions with a low level of basic incidence - in Turkestan, Zhambyl, Atyrau, Kyzylorda, Mangystau regions, Shymkent - from 0.01 to 0.20 per 1000 examined, as well as in West Kazakhstan, Akmola regions, Nur-Sultan - regions with an average and high incidence of CRC.

Compared to 2020, screening showed a decrease in the detection rate of CRC in the Mangystau region (from 1.04 to 0.20), Almaty (from 0.36 to 0.26), and Akmola (from 0.26 to 0.13), Karaganda (from 0.29 to 0.22) and Turkestan (from 0.06 to 0.01 per 1000 examined).

Colon precancer (adenoma detection rate) was detected in 22.8% of patients who underwent colonoscopy (2020 - 19%). Below the national average, the detection rate of colorectal precancer was noted in Akmola, Aktobe, Almaty, Atyrau, Zhambyl, Kyzylorda and Mangystau regions.

It should be noted that the indicator of detection of precancer of the colon for 2021, according to the Comprehensive Plan for the Control of Cancer, was 21.0% and was achieved. At the same time, in 2021, the proportion of patients with CRC identified during screening studies with early stages (0-I, II stages) was 89.1% (in 2020 - 89.3%).

The proportion of stage 0-I CRC was 27.5% (2020 - 33.7%); Stage II - 61.6% and 55.6% - respectively. High early detection of CRC (above 30%) was noted in the following regions: Akmola, Zhambyl, Kostanay, North Kazakhstan, Turkestan, East Kazakhstan regions, the cities of Almaty and Shymkent. Cases of cancer in stages III-IV detected during screening were registered in Almaty, West Kazakhstan, Karaganda, Kostanay, Pavlodar, East Kazakhstan regions, Almaty city. A total of 18 cases of CRC in stage III and 5 cases in stage IV were identified [3].

Thus, the goals of oncological colorectal screening can only be achieved with proper organization, high quality of conduct, active participation in population screening, the use of highly sensitive technology, accurate subsequent diagnosis of detected tumors, and modern treatment.

High-quality colorectal screening leads to early diagnosis of colon neoplasms, both benign in the form of polyps, and CRC in the early stages, which, in turn, improves the effectiveness of treatment and improves the prognosis of the disease. Target groups surveyed, who for one reason or another do not participate in this screening, should be informed that there are no other screening methods that could also effectively reduce mortality from CRC.

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Economic Sciences

INTERNATIONALIZATION PROCESS TO GLOBAL MARKETS – A FIRM-BASED VIEW

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INTRODUCTION

For my research, I have chosen Tele2 – a telecommunications company founded in 2001 by the Swedish group of companies Tele2 AB on the basis of networks acquired in the Russian Federation. I had to conduct interview with people who occupy leading positions in one of the biggest Kazakh telecommunication companies and make a research based on the answers.

The choice of Tele2 company may be due to several reasons: firstly, this company is widely known for the residents of Kazakhstan, as well as has a good reputation among users; secondly, it seemed tempting to learn more about the internal structure, scope of activity, international relations of the company with such a rich background. And the last but not least, Tele2 is a Russian company which well operates business in Kazakhstan. That is why at the point of view of international business relations between Russian Federation and Republic of Kazakhstan exactly this company seemed attractive for analyzing. I conducted an interview with Tele2 employee of financial department.

LITERATURE REVIEW

“Boom and bust” is a well-known expression and have been used in the context of many industries such as the railways since the mid-nineteenth century. It is a process that is generally driven by technological progress - new and more efficient ways of producing goods and services. In recent decades, rapid technological progress has been associated with anything digital such as computerization, but it is fair to say that the one thing most affected has been communications, broadly defined. Communications is a difficult term to pin down since it stretches from, say, the writing of a piece of software to the installation of a fibre-optic network, so it is customary to narrow the field somewhat for analytical purposes by restricting it to so-called technology, media and telecommunications (Peter J. Curwen & Jason Whalley). The book covers the decade from 1998 to 2008, and the term “volatile” barely does justice to that period from the viewpoint of mobile telecommunications industry, defines the process of internationalization to global markets of telecommunications. Tele2 is one of the fastest growing European telecom operators, offering customers the services they require for less money (Kazakhstani official website). Most of activities, pricing strategies and statistics are published on official website. I also used Tele2 Annual Report 2018 which contains consolidated financial statements, financial indicators, administrative reports by countries and disclosure notes to the financial statements. Annual Report 2018 helps to analyze financial information and compare Kazakhstani market share with total market share.

METHODOLOGY

The empirical research is conducted in order to the following:

- better understanding on the internationalization process
- connect theory with practice and promote learning regarding globalization, international marketing and innovation, internationalization of a firm, modes of entry and new market entry strategy

According to these purposes the questionnaire had been provided. I interviewed firm's employee in the office of the firm. Based on collected data I did analysis according to my personal knowledge in financial analysis and performance management spheres and with the use of additional materials. Used materials are listed in the references and sources part. The most frequent addressed materials are official data and public financial information.

ANALYSIS, FINDINGS AND DISCUSSION

Table 1: Firm's information

Name	Tele2 AB
Year of establishment	1993
Ownership of the firm	Earlier the company was 51% Sweden, then acquisition of Tele2 brand by Kazakhtelecom JSC in 2018
Business field of the firm/industry or service sector	Telecommunication service field
Turnover in previous year (Euro or Tenge)	EUR 96.7 million in turnover, up 4.5 percent from the respective period last year
Number of employees (permanent and temporary contracts)	About 8000
Position of the respondent	Employee of financial department

Tele2 started as a telecommunications company in Sweden in 1993 by the company [Investment AB Kinnevik](#). Tele2 operates in Sweden, Estonia, Kazakhstan, Latvia, Lithuania, the Netherlands, Austria and Germany. The internationalization process has started in 1996 according to the history. Since 1996, the company entered the international market. In 2000, Tele2 became Denmark's first virtual operator (MVNO). In the same year, the company received licenses for the construction of 3G networks in Sweden and Finland. In 2001, Tele2 entered the Spanish market, in 2003 - on the markets of Portugal, Belgium and the UK. In 2002, the company became a virtual mobile operator (MVNO) in the Netherlands.

Tele2 always acquires the shares of domestic companies and in addition the company is needed licenses to provide 3G, 4G connection, as an example: in January 1999 Swedish telecommunications company NetCom acquired Levi & Kuto UAB. Further in December, the third Lithuanian GSM operator TELE2 mobile network was launched in Vilnius and after one month the Levi & Kuto UAB was changed to Tele2 UAB. Also, Tele2 company operates in Austria since 1999, starting as an alternative fixed-line telephone operator. ADSL internet services were introduced in 2003. One Year later, Tele2 Austria bought UTA Telekom AG, a former competitor, and became the largest provider for alternative telecommunication service in Austria. As we see the Tele2 is a leader in the sphere of communication, it provides the values of low prices and good quality of the services. Tele2 fully provides the same services in each country where located.

The government of the republic of Kazakhstan has been liberalising gradually the sphere of telecommunication since 2004's year by changing the law on telecommunication of 1999. This reduced the market power of the state-owned incumbent operator Kazakhtelecom. The government reduced its share in JSC Kazakhtelecom (to 51%) in 2007. Since 2004, foreign investors entered the Kazakhstani market as Tele2 did in 2010. Sweden operator acquired 51% of shares of Mobile Telecom service LLP and the brand had a right to buy other 49% in 5 years. As one of us is having an internship in this company we can say that obviously even the Tele2 Kazakhstan did the highest margins over the last decades – all of the ratios and coefficients were at a great point – that is such a disappointment the company's behavior does not correspond with the values,

slogans. By this I mean the brand is historically positioned as a telefonia company which is against monopoly.

- *In how many foreign markets is the firm active today?*

As of 2019, Tele2 serves 17 million subscribers in 8 countries. The first Tele2 cellular network was launched in 1993 in Sweden. The period from 1997 to 2004 has become a time of full-scale business expansion in Europe. The company launches its networks in Norway, Estonia, Lithuania, Germany, Austria, Luxembourg, Switzerland, Holland, Latvia, Russia, Spain, Portugal, the UK and several other countries. The Tele2 brand (Mobile Telecom-Service LLP) first appeared on the telecommunications market of the Republic of Kazakhstan in 2010, completing a deal to buy a local telecom operator. In May 2019, Kazakhtelecom JSC acquired the remaining 49% of the mobile operator Tele2 AB in the joint venture, becoming the sole shareholder of the company.

- *What is the percentage of total annual sales coming from international sales?*

In 2018, the total sales revenue amounted to SEK 23,704 million, the total sales revenue from operations in Kazakhstan amounted to SEK 3,084 million. Thus, the total annual sales revenue for 2018 from international operations is SEK 20,620 million (23,704 - 3,084). Accordingly, the percentage of international sales of total sales is 86.99% (20620/23704).

- *Has the product/s been adapted to match the foreign markets and their different requirements? In which way?*

Since Tele2 was originally a foreign company and the process of internationalization to European markets (1997 – 2004) was earlier than the moment Tele2 entered the Kazakhstan market (2010), it becomes obvious that Tele2 in the Kazakhstan market is the result of the internationalization process. Consequently, the process of internationalization had place to be. According to Stanford L. Levin, the internationalization of mobile telecommunications is a comprehensive look at the rapidly changing market structure, the alternative technologies, the extent of globalization, and the ownership of firms in increasingly competitive mobile telecommunications markets around the world.

- *Has the pricing and price positioning (cf. low cost vs. premium) been different in foreign markets than in domestic market?*

Despite the positioning of Tele2 as a discounter (low price operator), the company occupies a modest place in the European market. During the internationalization to the market of Kazakhstan, the low-price policy was successful, since at that moment there was almost no competition in the telecommunication services market and prices were very high.

- *What kind of marketing communication and promotion the firm is using in foreign markets?*

We considered a communication strategy developed for residents of Moscow, the capital of the Russian Federation. Following the “Other Rules”, Tele2 used effective FMCG mechanics – such as a money-back guarantee (returning money to a subscriber in case of cancellation of services) and a test drive of connection. The company also strengthened the reputation of the operator with the dynamic development of the network: Tele2 was the first on the market to provide 100% coverage of the 4G network at all stations of the metro and proposed “Everywhere online” subscriber to use Wi-Fi in the underground without advertising. Continuing the role of the operator, which supports the lifestyle of subscribers, Tele2 provided them with the opportunity to visit the “Night of Museums” on special conditions – without queues, with author tours and free coffee. Within the framework of the strategy, several other projects were implemented aimed to improve the perception of communication quality and strength relevance. The result was the operator’s absolute leadership in the industry in Consideration factor (willingness of a potential customer to change operator) in Moscow.

CONCLUSION

In conclusion, I would like to quote the words of our foreign professor Maria Elo : "*the learning process takes place both inside and outside your classroom and sometimes to better understand the essence of business and entrepreneurship you need to plunge into this environment in real life.*" I have found that the heads of large organizations are eager to tell young followers about the essence of their work and are happy to share invaluable experience and knowledge. I found out a lot about globalization, international marketing and innovation, internationalization of a firm, modes of entry and new market entry strategy, resource base of the company including its stakeholders, role of networks and diaspora, global consumer culture, consumers as producers, prosumers, co-innovators and business actors, etc.

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ESG rating as a factor in increasing the competitiveness of companies

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Annotation: Currently, one of the development trends is the introduction of ESG principles in the business models of corporations in both the financial and non-financial sectors of the economy. Business adaptation to the principles of environmental (E), social (S) and corporate (G) responsibility, i.e. ESG-transformation, focused on the formation of a responsible attitude of organizations to the preservation and protection of the environment; increasing social responsibility; quality corporate governance. ESG criteria are the basis for compiling various ratings. The participation of businesses in the ESG ratings only confirms their commitment to the concept of sustainable development and is a very important factor, as it improves the reputation and image of the business. ESG rating is recognized as an important tool for the implementation and development of the ESG agenda. As part of the study, the main directions of development of ESG ratings were considered, the content of ESG factors was disclosed, and the analysis of the positions of Kazakhstani companies in ESG ratings was carried out.

Key words: ESG principles, ESG ratings, ESG rankings, sustainable development, sustainable investment, ESG reporting, rating agencies, competitiveness.

Today, an increasing number of investors around the world are choosing companies and securities responsibly, paying special attention to their compliance with the principles of sustainable development. Sustainable development is usually evaluated in three separate categories - Environmental, Social, Governance, which are called ESG criteria. Companies strive to take into account the principles of environmental, social and governance sustainability in the implementation of their development strategy, and the ESG rating is a tool for assessing their efforts.

With the promotion of the sustainable development movement, there is growing demand from investors for financial instruments that promote a greener economy and reduce the risks associated with climate change and social factors. Capital providers are implementing the principles of sustainable financing, which means evaluating an investee against ESG criteria in order to make an investment or financing decision. At the same time, as part of the practice of "sustainable" investments, capital providers are faced with the problem of assessing the ESG profile of companies. Methodologies for assessing financial performance have been developed and tested for a long time, but the procedures for assessing environmental, social and governance performance are still new and have not yet stood the test of time. Some investors and lenders are developing their own methods for assessing business ESG indicators. Others resort to the help of a third party, specialized companies that assign ESG ratings.

The ESG (Environmental, Social and Governance) rating is the Agency's expert opinion, expressed as a symbolic (letter) indicator, regarding the company's exposure to environmental and social business risks, as well as corporate governance risks, based on an assessment of the quality of compliance with relevant practices and their compliance with basic international and/or national guidelines, standards and best practices in the field of sustainable development. The ESG

rating is not a credit rating; it is not related to an assessment of the company's ability to fulfill its financial obligations and does not reflect the Agency's opinion on the creditworthiness, or financial reliability/financial stability of the company [3].

The ESG Risk Ratings measure the degree to which a company's economic value is at risk driven by ESG factors or, more technically speaking, the magnitude of a company's unmanaged ESG risks. A company's ESG Risk Rating is comprised of a quantitative score and a risk category. The quantitative score represents units of unmanaged ESG risk with lower scores representing less unmanaged risk. Unmanaged Risk is measured on an open-ended scale starting at zero (no risk) and, for 95% of cases, a maximum score below 50. Based on their quantitative scores, companies are grouped into one of five risk categories (negligible, low, medium, high, severe). These risk categories are absolute, meaning that a 'high risk' assessment reflects a comparable degree of unmanaged ESG risk across all subindustries covered. This means that a bank, for example, can be directly compared with an oil company or any other type of company. [6].

ESG ratings are used to assess the effectiveness of a company's management and to predict potential corporate, environmental and social risks. In addition, the presence of an ESG rating can increase the interest of investors and clients focused on working with those companies whose activities comply with the principles of sustainable development. Against the backdrop of global climate and environmental changes, as well as the growing importance of a socially responsible approach to doing business, the need to assess the integration of sustainable development principles into the business processes of companies will continue to grow (Figure 1).

E-factors	S-factors	G-factors
<ul style="list-style-type: none"> • Environmental policy • Impact on the atmosphere • Impact on the aquatic environment • Impact on the ground • Waste management • Accounting for indicators affecting the environment • Environmental Impact Mitigation Plan • "Green" projects in the loan portfolio (only for banks) 	<ul style="list-style-type: none"> • Corporate Social Responsibility Policy • Compensation of employees • Social security and professional development of employees • Staff turnover • Labor protection and industrial safety • Work with clients • Plan to improve socially significant indicators 	<ul style="list-style-type: none"> • Business reputation • Development strategy • Efficiency of the Board of Directors • Activities of executive bodies • Risk management system • Degree of information transparency • Protection of the rights of owners

Figure 1. Key assessment factors when assigning a rating

Compiled by the author based on [5]

The ESG criteria were first formulated in 2004 as a guideline for socially oriented investors. ESG ratings became popular six years later, and since 2015, such ratings have been actively used by investors.

ESG rating originates from the system of credit ratings, on the basis of which the probability of default is determined according to the scales of credit rating agencies.

In the modern sense, ESG principles were introduced by former UN Secretary General Kofi Annan. In 2004, in his "Who Cares Wins" address to leading financial institutions, he encouraged CEOs of major global companies to incorporate these principles into their long-term strategies.

In 2005, the term ESG became more widely used when the UN supported the Principles of Responsible Investment (PRI) initiative. This document urged investors to take ESG criteria into account when making decisions.

After 2010, the demand for responsible investment began to appear, which led to the emergence of a whole category of social investors. Credit ratings began to be supplemented by ratings or markings of issuers in accordance with ESG criteria. The evolutionary process took more than 15 years: from the formulation of criteria, the labeling of issuers, the emergence of ESG ratings and rankings, to the inclusion of ESG criteria in credit risk assessment methodology [8].

The main driver for the development of risk assessment of issuers, whose policies are being transformed taking into account the sustainable development agenda and the achievement of ESG criteria, was precisely the request from investors.

The growing interest in responsible investing has led to a rapid increase in the number of ESG products, which has become the reason for the wide popularity and demand for ESG ratings and database providers.

In addition to ESG ratings and rankings, of which there are more than 500 today, there are more than 100 ESG awards and about 120 voluntary ESG disclosure standards [8].

Depending on the approach to assessing ESG, data and rating providers can be divided into 3 main groups (Figure 2).

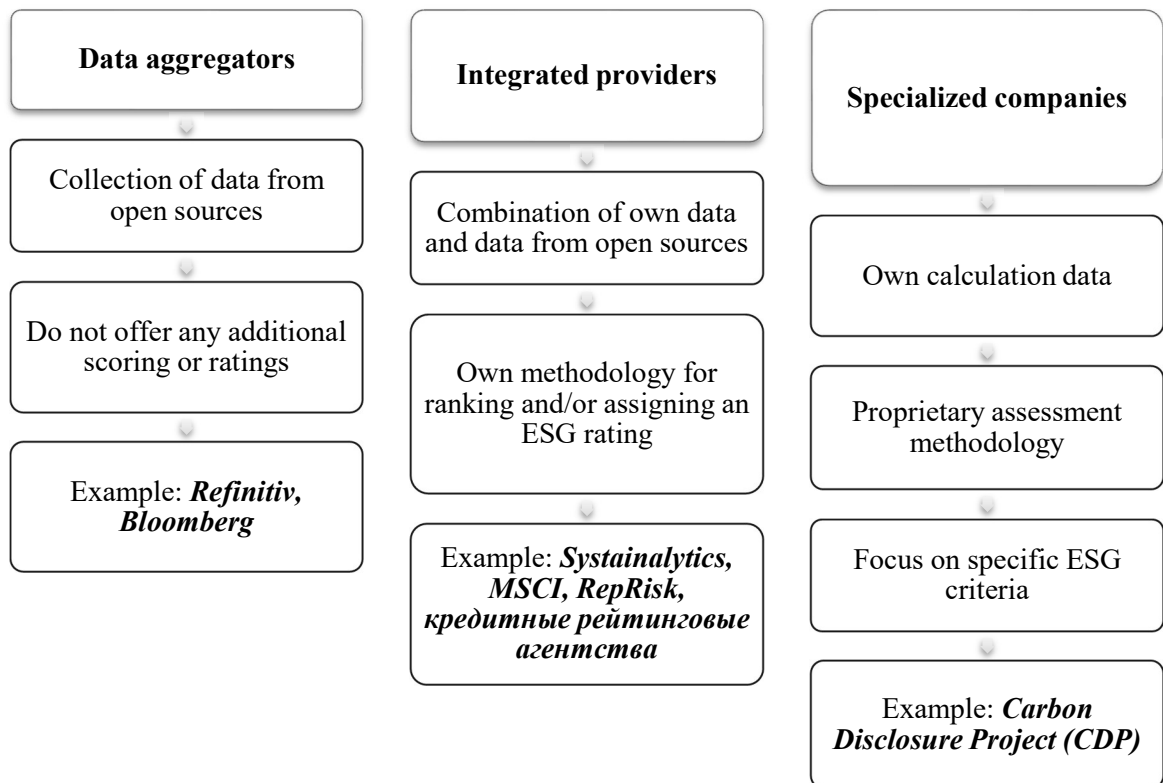


Figure 2. Most common types of ESG data and ESG rating providers

Compiled by the author based on [5]

Both ratings and rankings evaluate companies according to ESG criteria.

ESG rankings are compiled based on the analysis of information posted by companies in the public domain. Basically, these are documents, policies, sustainability reports, strategies, individual corporate documents. If such data is not disclosed, the opacity of the company does not allow it to get a high place in the ranking.

When assigning an ESG rating, there is direct contact between the company that receives this rating and the agency that evaluates the level of this rating. At the same time, the rated entity

provides full information; in some cases the NDA principle may be included. A rating interview is mandatory, where company representatives provide detailed comments on the sustainable development strategy, results achieved, the dynamics of individual indicators, supplementing public information.

Due to the lack of clear compliance standards and interpretation of the ESG approach, rating agencies began to form ESG ratings based on their own set of assessment methods. At the same time, most of them are based on the current recommendations provided by the United Nations, and, of course, on the requests of investors. Rating agencies analyze the company's policy, its systems and measures to comply with ESG criteria. The object of analysis is all public non-financial information of the company, which is collected from a variety of sources. Very often, agencies conduct surveys to collect some additional information. When compiling ratings, agencies use a special mechanism for their adjustment, taking into account the specifics of the industry in which the company operates. The relative performance of the analyzed company is compared with the performance of similar companies. Thus, when building a universal rating, certain benchmarks are formed that are suitable for evaluating activities in any industry. If a company wants to improve its ESG score, then it must first establish a solid ESG management structure within the company. The main goal of such a structure is to create a system of continuous monitoring of compliance with ESG criteria, aimed at improving and optimizing these indicators.

Most of the international public and private companies are evaluated according to ESG-indicators of the leading foreign financial, analytical and rating agencies.

Bloomberg and its Bloomberg ESG rating

Bloomberg ESG collects ESG policy data from over 10,000 companies worldwide. Based on the information received, it annually generates ratings of companies. The Bloomberg rating scale is based on 100 points, which, in addition to analyzing companies from the standpoint of the ESG approach and comparing with similar companies, includes data from other rating agencies. The analytics itself is based on an annual assessment of publicly available information on compliance with the ESG principles disclosed by companies through non-financial reporting, annual reports, websites and other open sources. Bloomberg may also contact the companies for certain information. All received information is grouped, authenticated and standardized. The analytical data collected by Bloomberg covers 120 environmental, social and corporate indicators [4].

Corporate Knights and its Global 100 ranking

This financial and analytical company annually compiles the Global 100 rating of the 100 most sustainable corporations in the world, which is then published in the Corporate Knights magazine. This is the world's largest publication covering the issues of sustainable development of responsible business. Corporate Knights builds its rating scale for certain industries based on the maximum possible 100 points. The corporation analyzes more than eight thousand companies with a minimum gross income of \$ 1 billion and compares them with industry peers around the world. The ranking is based on 24 qualitative key indicators such as resource management, personnel management, financial management, net income and net investment, and supplier performance. This rating is based on officially disclosed information. Prior to the publication of the results, the compilers of the rating, together with the analyzed companies, reconcile the data. The criteria used to evaluate the companies included energy efficiency, carbon generation, water pollution, waste management, research and development, cash-to-tax ratio, the difference between the earnings of management and the average worker, pension fund status, injury rate, number of accidents deaths at work, staff turnover, the percentage of women in the total composition of workers and among managers, etc. [4].

RobecoSAM and its Dow Jones Index

The Dow Jones Sustainability Index (DJSI) was founded in 1999 and was the first global index to include ESG analysis. This analysis was prepared by RobecoSAM, a company that tracks data on public companies that are committed to responsible and sustainable development. To further calculate the publication of ESG indices, S&P Dow Jones Indices entered into a partnership agreement with RobecoSAM. Previously, the DJSI index was differentiated into the DJSI World indices (it tracked the world's leading companies), DJSI Regions and DJSI Country. In December 2021, the last two are excluded from the general system and divided into country-by-country regional indices: DJSI North America, DJSI Europe, DJSI Asia Pacific, etc. The DJSI World rating scale, like that of previous agencies, is based on the principles of a 100-point system for a certain industry. The DJSI World index reflects the best companies in 60 sectors of the S&P Global BMI (broad market index). Rating scores are based on an annual assessment of the level of corporate sustainability, data on which is provided by RobecoSAM. The questionnaire for the analyzed companies includes from 80 to 120 questions, due to which more than 100 aspects of the ESG approach are subject to consideration [4].

ISS and its ISS Quality Score

ISS is a group of companies founded in 1985 to serve institutional shareholders. Today, ISS is a leading provider of corporate governance and responsible investment solutions, market intelligence, fund services, and events and editorial content for institutional investors and corporations around the world. The ISS Quality Score rating scale is based on intervals from the first to the tenth decile. The first decile indicates relatively high quality and relatively low corporate governance risks, while the tenth decile characterizes relatively high corporate governance risks. This rating is updated regularly. When compiling it, more than 200 factors are analyzed, which are divided into four main components: board structure, compensation and remuneration, shareholder rights, audit and risk oversight. ISS subsidiary ISSEthix conducts research and analysis on a number of ESG topics. For example, in July 2017, ISS-Ethix, in partnership with CDP, created the world's first climate impact rating for investment funds, aimed at supporting investments in the context of climate conservation. The rating evaluates companies on a scale from one to five "green sheets". The very concept of "green sheets" acts as certain criteria taken into account in the methodology. It is important to note that the company does not disclose the process of assessing aspects of ESG. According to the official ISS-Ethix website, companies that have passed the assessment procedure are only allowed to disclose their overall scores and/or environmental, social and governance quality ratings [4].

MSCI ESG Research and its MSCI ESG rating

The company, founded in 2010, is an integral part of the MSCI Group. At present, MSCI ESG Research is the largest independent ESG rating operator that evaluates more than 8.5 thousand companies and more than 680 thousand fixed income stocks and securities worldwide. The MSCI ESG rating is designed to assess a company's resilience to long-term, industry, environmental, social and governance risks. The ranking uses a methodology based on rules to identify industry leaders and laggards according to their exposure to ESG risks and how well they manage those risks compared to their peers. MSCI ESG Research ratings range from leader (AAA, AA), average (A, BBB, BB) to laggard (B, CCC). The assessment of the analyzed companies is carried out on the basis of 37 questions of the ESG principles, divided into three key categories and 10 topics. Information for analysis is collected from reports, publications of companies. At 45% (according to the website), ratings are formed on the basis of objective information obtained from alternative sources: the media, non-governmental organizations, government databases, etc. In addition, MSCI conducts regular monitoring of the analyzed companies, during which, among other things, including using artificial intelligence technology, data about them is checked and structured. MSCI also conducts a full audit of corporate governance information disclosed by

companies once a year. An assessment of investment portfolios and their risks, reporting and disclosure of information to regulatory authorities, securities within the ESG, and the presence of long-term trends for development is carried out [4].

RepRisk and its RepRisk ESG Risk Platform rating

The company was founded in 1998 and currently provides ESG reports for more than 84 thousand private organizations from 34 sectors of the economy, for more than 20 thousand governmental and non-governmental organizations, regulators. When building ratings, the company uses a rating scale from AAA to D, which facilitates a comparative analysis of reputational risks associated with ESG principles in the process of business conduct. The lower the letter designation (D), the more serious the company's risk of violating one or more of the 10 principles of the UN Global Compact. RepRisk focuses on 28 ESG issues aligned with the 10 principles of the UN Global Compact. RepRisk is partnering with CDP to produce an annual review of the leading companies in carbon and water efficiency, the Carbon Performance Leaders and Water Performance Leaders. RepRisk publishes two types of reports: company summaries and company reports, which contain a final assessment of the company's activities, its risks, according to ESG criteria, as well as an analysis of current issues related to controversial goods and services, supply chain problems, violations of the law, compliance with standards [4].

Sustainalytics and its rating Sustainalytics Company ESG Reports

The company has been operating since 2008. Sustainalytics currently ranks over 6,500 companies operating in 42 industries. The rating scale is based on a 100-point system; companies are compared by sectors of the economy. Sustainalytics considers key aspects and indicators of ESG principles: issues of ecology, social and corporate responsibility. At the same time, the industry of production directly affects the weight of the value of each of the indicators. In total, the company covers at least 70 indicators in each industry. Before publishing its report, Sustainalytics sends it to the researched company in order to receive feedback in order to supplement and expand the report [4].

Thomson Reuters and its Thomson Reuters ESG rating

Thomson Reuters was formed in 2008 following Thomson Reuters' acquisition of Asset4, which provided raw ESG data to investors. Since that moment, Thomson Reuters has been creating ESG ratings, in the formation of which it uses the percentile rank of the score, presented both as a percentage and in a letter rating system from A+ to D-. Thomson Reuters analyzes companies on over 400 different ESG metrics. The most significant, and there are 178 of them, are grouped into 10 categories (topics), each of which has its own weighting factor. The category that covers the most questions will have the highest weight (figure). Also, Thomson Reuters ESG Score uses the analysis of 23 "disputed issues". From their perspective, it measures a company's exposure to environmental, social, and governance controversy and negative developments in the global media. If the analyzed company is involved in a scandal, then this is all reflected in the overall ESG scores and ratings [4].

The main function of ESG ratings is to briefly and meaningfully describe a company's ESG profile and its performance and sustainability performance. Due to the problem of standardization, investors are not inclined to fully rely on these estimates when analyzing investment risks, and use them more often in a combined form [6]. Investors often use more than one rating so they have access to more research and information. ESG ratings and rating report data are used to complement fundamental analysis, portfolio building (identifying leaders and underperformers), and collecting and disclosing information about the ESG impacts of the funded portfolio. Due to the high attention of investors to the sustainability agenda, companies can use ESG ratings to promote their financial instruments. In addition, companies with high ESG ratings often end up in specialized ESG indices and special listing platforms, which also contributes to

increasing the company's attractiveness and distinguishes its instruments from the general background.

ESG ratings are also used by companies to improve their own ESG practices. Most ratings, in addition to the assessment itself, show the company's position in relation to its competitors and other industry representatives, which can help in creating an improvement strategy. The ESG rating also helps companies communicate to stakeholders other than investors about their sustainability performance [2].

Institutional investors tend to look at ESG factors in terms of long-term value creation. In addition, the market has formed a growing group of ESG investors who work exclusively with "sustainable" companies. Together, these investors are increasingly vocal about their interests in this area.

ESG reporting can be called by different names - sustainability reporting, corporate social responsibility reporting, and reporting on ESG risk opportunities. Market participants want to know how companies assign weights to ESG risks and consider ESG factors when formulating their business strategy.

Providing information on ESG factors allows you to confirm the reputation of the company, while the refusal to disclose it can negatively affect the company's market value, access to capital and brand reputation in the market. In short, ESG reporting is the disclosure of significant ESG risks and opportunities in qualitative and quantitative terms. It also explains how and in what directions information about ESG risks and opportunities is taken into account when developing a company's business strategy.

ESG investors prioritize non-financial factors related to environmental, social and governance aspects in their analysis to identify risks and opportunities for growth. They can consider ESG risks along with financial results, exclude or choose investments based solely on ethical principles. They can also track investments that have a positive environmental impact or that provide public goods. They rely on ESG disclosures to make investment decisions.

This is also facilitated by conducting an ESG audit and obtaining certificates of compliance with the company's ESG goals.

Companies with well-articulated ESG strategies are generally in a better position to raise capital as more investors are willing to invest in these types of companies. Companies should think about how information about ESG factors reaches investors. Some of them receive this information directly from the company. Others use ESG data compiled or prepared by rating agencies (in particular, advisory firms, ESG rating compilers, and credit rating agencies).

In Kazakhstan, companies have also begun to switch to ESG (Table 1). In December 2021, PwC published a study assessing the quality and availability of ESG information in the public reporting of Kazakhstani companies following the results of 2020. The total sample included 96 companies operating in Kazakhstan. As a result of the assessment, a list of the top 10 best companies in terms of the level of ESG information disclosure was prepared. About 80% of the companies on the list are listed on the KASE, and the exchange's requirements to a large extent affect the disclosure of information. At the same time, the leaders of the rating are mainly companies that go beyond regulatory requirements and move towards following international standards and trends. According to the results of the study, the top 5 included KazMunayGas, Kazatomprom, KazTransOil, KEGOK and Kazakhtelecom [1].

Samruk-Kazyna actively promotes the principles of ESG. So, for example, in 2021, the fund began to develop an ESG policy that will establish uniform principles for ESG activities for Samruk-Kazyna and portfolio companies and declare commitment to ESG principles for investors. In 2020, KazMunayGas was the first company in Kazakhstan and the fund to receive an ESG rating from Sustainalytics. In 2021, the international agency Sustainalytics improved KMG's risk rating in the field of sustainable development from 34.5 to 28.4 points (above average) [1]. The

implementation of ESG principles is of great importance, as it will contribute to an increase in the long-term value of assets and an overall increase in investment attractiveness.

Table 1. Top 50 ESG Disclosure Companies (PwC)

Position 2020	Position 2019	Company	Position 2020	Position 2019	Company
1	1	"KazMunajGaz"	26	22	Kazpochta
2	2	NAK «Kazatomprom»	27	25	Eurasian Resources Group
3	3	KazTransOjl	28	-	SP "KATKO"
4	4	KEGOC	29	28	Ob"edinennaya himicheskaya kompaniya
5	16	Kazahtelekom	30	32	AK Altynalmas
6	10	NUH "Bajterek"	31	27	Samruk-Kazyna Construction
7	9	Samruk-Energo	32	61	Atyrauskij neftepererabatyvayush chij zavod
8	7	Narodnyj bank Kazahstana	33	36	Transtelekom
9	11	Central'no-Aziatskaya Elektroenergeticheskaya Korporaciya	34	33	Eksportnaya strahovaya kompaniya «KazakhExport»
10	5	KAZ Minerals PLC	35	-	AO «Kazakhmys Copper»
11	13	KazAgroFinans	36	24	Kazahstanskije kommunal'nye sistemy
12	6	«Karachaganak Petroleum Operejting B.V.»	37	35	ForteBank
13	34	Kazahstanskaya ZHilishchnaya Kompaniya	38	42	Investicionnyj fond Kazahstana
14	14	PAVLODARENERGO	39	50	FRP "Damu"
15	21	SEVKAZENERGO	40	52	KMK Munaj
16	12	NOSTRUM OIL & GAS PLC	41	63	NK "Prodovol'stvennaya kontrakt'naya korporaciya"
17	23	NK "Kazakstan temir zholy"	42	73	Kazyna Kapital Menedzhment
18	8	«ZHilstrojsberbank Kazahstana»	43	30	KazAzot
19	19	Bank Razvitiya Kazahstana	44	51	DB AO "Sberbank"
20	15	"Samruk-Kazyna"	45	66	Agrarnaya kreditnaya korporaciya
21	18	NGK "Tau-Ken Samruk"	46	56	Evrazijskij Bank
22	31	Air Astana	47	44	Embamunajgaz
23	17	SHubarkol' komir	48	38	Batys tranzit
24	26	ZHaikmunaj	49	-	AO "SHubarkol' Premium"
25	29	TNK "Kazkhrom"	50	76	RG Brands

Note - compiled by the author based on [7]

In the context of a deep restructuring of economic ties and relations, the main goal of a modern company is changing. The harmonization of interests of all participants in the market process comes to the fore. There is a clear relationship between sustainable development and

business reputation of the company. Strengthening the socialization of business is manifested in the development of the trend of taking into account ESG factors in assessing the company's activities. Companies that adhere to ESG principles increase their reputation in the eyes of interested parties - stakeholders. Building relationships with stakeholders, taking into account their interests, meeting their needs is the shortest way to building a positive business reputation. Numerous stakeholders should be considered as significant and significant participants in corporate relations, expecting benefits from interaction with the company. And it's not always economic benefits. There is a noticeable trend towards increased control by stakeholders over the impact of the company on nature and society. Under these conditions, the requirements for the quality of corporate governance, the implementation of the principles of corporate social responsibility, and the business reputation of the company are increasing. The conditions for attracting capital necessary for the implementation of the set strategic and tactical tasks are changing. The share of institutional investors in the share capital is growing, which, when choosing an investment object, impose strict requirements on companies in relation to their compliance with ESG principles, thereby increasing the responsibility of companies for the results of their impact on nature and society. In turn, companies that adhere to ESG principles are able to generate more sustainable income by improving their business reputation. The formation of an investment image that complies with ESG principles and promotes capital raising should begin within the company. A company that cares about its business reputation builds its own investment image based on corporate values and policies, a set of specific competencies, culture and obligations to employees, and a responsible attitude to the environment.

Embedding the ESG agenda in corporate strategies is the leading trend in the development of Kazakhstani business, as it allows not only solving environmental, social and management problems, but also attracting investments for companies, improving the image and business reputation. However, there are a number of limitations that hinder the process of ESG transformation: the lack of a unified methodological and methodological approach to compiling ESG ratings, as well as standards for compiling non-financial corporate reporting that discloses economic, social and environmental indicators of sustainable development.

Thus, adherence to the principles of sustainable development guarantees the organization the development and preservation of competitiveness in the long term.

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DEVELOPMENT OF TOURISM INDUSTRY OF THE REPUBLIC OF MALDIVES

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Abstract: The aim of this research paper is to observe and analyze the tourism industry in the Maldives, paying attention to its history, government organization, regulations, policies, performances, zoning, and recent changes.

1. INTRODUCTION:

Tourism in the Maldives is the leading industry in the economy of the island nation. Also, it plays an essential role in generating foreign exchange earnings and creating jobs in the service sector. The Maldives archipelago attracts tourists from all over the world.

Tourism has brought prosperity and progress to the Maldives. It all started with the opening of Kurumba in 1972. At that time, only fishers lived on this remote archipelago. It was unknown to the outside world, did not have foreign investments. At the time, Hulu Island (where the International Airport is now located) had a small runway built by volunteers. There were no regular flights. Mohamed Umar Maniku, Chairman of the Board of Directors of Universal Enterprises, recalls: *"We had nothing in the Maldives, nothing at all. No banks, no airport, no telephones. Amateur radio only or Morse code for communication with Colombo. Even UNDP experts said that tourism would never succeed here because there were no resources or infrastructure."*

The travel industry has been an industry that could have ruined an opportunity to develop without much of a stretch. Nevertheless, the travel industry is flourishing gratitude to the once youthful Maldivian authors. They ended up being the perfect individuals in the perfect spot at the perfect time with their commitment and assurance.

Everything began with an opportunity meeting in Colombo of George Corbin, an Italian travel planner, with Ahmed Nasim. He at the time began serving at the Maldives embassy and later became foreign minister. At the time, Mr. Corbin was looking for unspoiled islands to bring Italians to swim and fish. Corbin fell in love with the idyllic Maldivian archipelago at first sight. After his first visit to Male with Nasim on a cargo ship in 1971, he promised to return here with more tourists.

First tourists were brought by Corbin to the Maldives, mainly journalists and photographers, in February 1972. They stayed in three modest houses on Male, which were looked after by M. Yu. Maniku and his friends. Among them was Hussein Afif, who is currently the successful owner and operator of several resorts. Perfect for swimming, sunbathing, fishing, the Maldives have captivated them. Corbin promised Manik, Nasim, and Afif to bring more tourists here if they could find a place to stay. Thus, Kurumba was born.

Inspired by their enthusiasm, Maniku and Afif contacted Fr. Vihamanafushi, an uninhabited island set aside for coconut plantations. They chose this island for its proximity to the runway and the capital. It was possible to reach the island only by dhoni boats or boats with an outboard motor. There was not even a pier (although it was later built using the trunks of coconut trees as supports). When arriving by boat to the beach, tourists were required to wade across the surf to the resort.

Mr. M. Yu. Maniku, an employee of the Ministry of Agriculture, devoted time after work every evening to the development of Fr. Vihamanafushi. With monetary help from Mr. Corbin and their assets, Maniku and his kindred Maldivians fabricated 30 rooms (in gatherings of three) utilizing coral blocks for walls, coconut wood, and palm leaves for rooftops. Each room had a salty water shower and latrine, fundamental decorations, and beach access. It was possible to eat in the dining room or barbecue on the beach.

2. THE FIRST RESORT OF THE MALDIVES

They named the resort "Kurumba Village" (Kurumba means "coconut" in translation from Dhivehi). Afif became a manager. The resort opened on Tuesday, October 3, 1972, and was fully booked for the remainder of the year, which boded for its future success.

"We did not know anything about tourism," says Maniku. "It was tourists who helped us develop this industry here. We listened to their wishes and provided them with what they wanted. Luckily for us, they wanted simplicity in their natural environment, which we had to offer and what we had the means."

Whereas in its humble beginnings, Kurumba was able to accommodate only 60 visitors a month, now that figure is 14,000. The staff, initially composed of founding friends, has grown to 450 people. There are some people who worked here for over 20 years.

"Initially," says Maniku, "we did not have the foggiest idea what to cook for unfamiliar travelers. I had a book with recipes which I translated into Dhivehi for the nations to peruse."

Kurumba bedid not expand to accommodate more guests after the airport was renovated to accommodate international flights. Kurumba is a real tropical village, but only with the comforts of home. Freshwater, air conditioners, and restaurants with dishes from different countries appeared. In 2003, the resort was once again wholly renovated to meet the requirements of the 21st century. As a result, it is now a world-class resort with 180 rooms, including the royal residence, presidential suites, pool villas, family villas, and superior beach or garden views.

This is the result of natural development, ambitious persistence, and high-quality service over the years. Kurumba has become the Maldives' premier resort, setting the tourism industry benchmark in the region and the tropics in general.

3. SPECIALIZATION IN THE MALDIVES INDUSTRY

As indicated by the Maldives Tourism Promotion Board's official site, the nation resembles a white and blue world for honeymooners, jumpers, and maturing Robinson Crusoe. Without a doubt, it is the worldwide submission of the Maldives. The explanation behind this touristic advancement is segregation: travelers are permitted (and held on) to invest energy in extravagance resorts while Maldivian occupants are contained on local islands. Taking into account this wonder of social and spatial partition, the expression "visit" is unseemly. "Experience" would be more reasonable: Maldivian island-inn is a walled model in the area, rehashed at various scales and concerning various individuals. It empowers vacationers to keep up their propensities in a superb climate while the chance of a feared "social contamination" is contained. Staff individuals are the prominent individuals encountering the outskirts, both knowing and living in what is by all accounts two equal universes: island-lodgings structure their work environment and home. Island-hotel is a social, spatial, and political development where an intriguing, innovative world works out. Additionally, it is an area where nook, regulation have various utilizations: from one viewpoint arranging the hotel to offer a scene and a social setting past the real world, then again evading dwelling together (aside from the previously mentioned instance of resorts staff). For example, among the 200 local islands (for example, populated islands), Malé is the capital-

island. Thilafushi is known as the rubbish island for being the nation's landfill site Hulhumalé is the air terminal island. Specialization is both generic and adapted to the setting of an archipelagic miniature state. As a political and strict choice, the travel industry improvement depends on additional specialization, for example, segregation. To save Maldivian Muslim occupants from westerner' vacationers and evade a feared tainting of Maldivian personality, the travel industry (and sightseers) is contained on various islands. As a matter of fact, the social, monetary, and social foundations of vacationers and occupants are diverse yet spatial detachment expands that distinction.

The travel industry happens in committed islands: islands-lodgings. First islands inns have been worked close to the air terminal and the capital city, north, and south Malé atolls, at that point in nearest atolls like Ari. These days, there are 98 lodgings islands in the entire Maldivian archipelago regardless of whether Ari and Malé atolls are the primary seats. This social and spatial partition is appropriate for political partners whose point is by all accounts checking and watching traveler's versatility. Nevertheless, vacationers themselves are satisfied with this fact since it empowers them to live a so-called dream come true. Though, it should be mainly mentioned, that tourist visa requirements are well-managed with all nationalities granted "outcome," with the highest point possible to embody the wishful vacation.

4. TOURIST VISA GUIDELINES AND ENTRY REQUIREMENTS

A foreigner traveling to the Maldives as a tourist does not require pre-approval for the visa. The person must satisfy the basic entry requirements to get immigration clearance upon arrival:
- A passport or a travel document with Machine Readable Zone with at least six months validity.
Passport and other documents must be valid for a minimum of 30 days from the arrival date.

- A pre-paid hotel booking

- Confirmed tickets to home country

- Entry facilities to their onward destinations

- Traveller Health Declaration

The most significant number of days allowed on appearance would be 30 days, except if concurred by any respective methods or arrangement. This time of stay is not for the guest to guarantee; however, it lies at the Maldives Immigration's caution to allow quite a few days not exactly or equivalent to 30.

The time of remain allowed has appeared on the endorsement in the passport. Guests are encouraged to check their endorsement for the arrival endorsement and observe the number of days conceded to remain in the Maldives. When shown up as a traveler, the guest cannot participate in any business, occupation, calling, or paid work while in the Maldives.

Categories like: social guests, companions, family guests, or media and business guests, who are not considered real travelers, are profoundly encouraged to pronounce sponsorship before their appearances (if appropriate) to encourage the section's progression.

All explorers are additionally reminded that it is a culpable offense to exceed in Maldives past the number of days given.

5. PRIVATE AND PUBLIC SECTOR ORGANIZATIONS

The Maldives Tourism Industry Association (MATI) is a *non-governmental, non-profit* organization established in 1982 with the aim of promoting and developing tourism in the Maldives. Three decades of **MATI** services have been provided for almost all travel and tourism-related issues that arise in the Maldives.

MATI's essential function is to coordinate with all mandatory government policymakers to bring new laws and regulations in line with tourism industry best practices. **MATI** coordinates with the government and liaises with local and international organizations to strengthen its members' services and operations in the tourism sector.

The association coordinates with all mandatory government bodies and policy-making organizations to participate in all **MATI** member-related activities. Throughout all these years, the association has sustained its existence by participating in these activities, actively pursuing research, and promoting and raising awareness on behalf of the association's members.

MATI expresses concern about government policies for both members and the tourism industry in general. The affiliation speaks to the business and its representatives universally and locally by going to different seminars, arranging, and providing exploration and expert counsel to the required specialists.

Focus areas:

- Tourism development and planning
- Quality and standards
- Education and training
- Environment and culture.

Government also controls the tourism impact on economics, culture, and environment. For example, the authorities of the Maldives have introduced a "green" tax on tourists. Now all foreigners arriving at the country's hotels pay \$ 6 per day. The tax is also levied on cruise ship passengers visiting the islands. Only citizens of the Republic of Maldives are exempt from tax if they come on vacation.

Tour operators working in the Maldivian direction believe that the new tax will not affect tourists - against the background of the high cost of living in local hotels, travelers will not notice it. The funds raised in this way will be used to protect the environment of the archipelago.

6. ENVIRONMENTAL REGULATIONS AND SOCIOECONOMIC IMPACT OF TOURISM IN THE MALDIVES

The administration of the environment, a significant perspective that the government imagines are safeguarding the first natural cycles. To meet this end, the expulsion of indigenous vegetation, disturbance of marine biology, redirection of unique current examples, and bending of the wave designs inside the tidal pond by the development of structures is debilitating. A portion of the natural guidelines and controls here include:

- a) control and obligatory swap for each tree chopped down (individual uncommon and giant trees must be dodged while developing a structure). All structures must be found well away from the fringe vegetation - in any event, 5 meters from the shoreline to guarantee that the fringe vegetation generally significant for beachfront insurance is protected;
- b) allotting space for vegetation between each building. This is to guarantee that considerable zones of indigenous vegetation are left immaculate;
- c) every single waterfront work and more significant activities must be started after a thorough natural effect appraisal. Demanding designing answers for dynamic coastlines are debilitating;
- d) development of rock-filled wharves and crotches are controlled. Plan of boat wharves and breakwaters should be so as not to block the first progression of flows or disturb the wave atmosphere inside the tidal pond;
- e) development of seawalls, separated, and lowered embankments are confined. All things being equal, the advancement of more noteworthy coral colonization on the fringe reefs and other common strategies to ensure shorelines are empowered;

- f) coral and sand mining from resorts and occupied islands and their home reefs are carefully disallowed. All the more, as of late certain particular areas have been assigned for sand and coral mining. Development of structures with coral is currently being controlled;
- g) lance, toxin, and explosive fishing are carefully precluded. Net and trap fishing are controlled and restricted to specific regions. Expulsion of shells, fishing of turtles and turtle, adolescent and gravid lobsters are carefully disallowed;
- h) all hotels are needed to have incinerators, bottle pounds, and compactors. Strong waste must be scorched, metal jars compacted, and bottles pulverize before removal. A portion of the retreats are currently utilizing natural waste as composts;
- i) sewage removal through splash pits into the spring is debilitate (consent to do so is dictated by the size of the island and measure of utilization of the spring). Sewage arranged should be beneath government affirmed standard of organic oxygen request under 20 mg/l; Ammonia nitrogen 2-4 mg/l and suspended solids 20 mg/l; and
- j) other ecological guidelines incorporate engineering controls. To protect the stylish respectability of resort islands, the stature of structures is confined to the tallness of the foliage of the vegetation. They must be very much incorporated into the island. Thus, utilization of nearby materials is energized.

The travel industry in the Maldives can adversely affect local people in light of the fact that an enormous segment of the resorts is possessed by unfamiliar organizations, which implies that local people of the Maldives will not get a high level of cash since it would have gone abroad. The unfamiliar organizations are said to have their advertising divisions, and they contract out their rooms to enormous visit gatherings. This makes it harder for nearby organizations to pull in sightseers because of the opposition.

The travel industry has likewise adversely influenced the association between local people. There is additionally a more prominent imbalance in riches, and this is appeared by a couple of neighborhood people who own hotels who likewise own few yachts and the yearly compensation for resort staff being just NZ \$1550. This could cause conflicts with specific individuals having much more abundance than others.

Be that as it may, the travel industry likewise emphatically influences local people since it gives work and brings cash once more into their administration, which encourages them all as a nation. It is assessed that "11% of Maldives' populace of 314,000 [2009] are utilized in the travel industry". The travel industry achieves \$600 million per year and produces 60% of all foreign money acquired. It additionally represents 90% of the public authority's income.

The travel industry may emphatically influence sightseers rolling in from different nations on the grounds that there are numerous eco the travel industry organizations out there who are advancing supportability. For instance, Naturetrek Wildlife Holidays have said, "*All travel industry affects nearby networks, untamed life, and territories of the host nation. To expand the beneficial outcomes of Naturetrek visits, where conceivable, we take little gatherings, utilize privately possessed convenience, and give work to nearby individuals. We additionally resolve to long haul plans, which assist nearby networks with ensuring their current circumstance.*". Tourists may study supportability and may place that without hesitation when they return home.

7. ECOTOURISM IN THE MALDIVES

Ecotourism in the Maldives has become very popular recently due to the fact that it guarantees the best way to relax and unwind in nature. As tourism is the main generator of income in the Maldives, various projects that combine sustainability with the hotel business are significant. The construction of new eco-friendly hotels by the Maldivians themselves with money taken from within the country is extremely important for both the economy and the Maldivian culture.

Preserving the beauty of the Maldives and restoring the ecosystem of coral reefs after their bleaching due to the harmful effects of El Niño requires much money, as well as attracting volunteers from around the world. By saying so, ecotourism in the Maldives, based on the knowledge and behavior of tourists who are not indifferent to ecology problems, brings much more benefit to the Maldives than the construction of luxury resorts. The Maldivian authorities used even to sell their islands, but today they lease them out on a long-term lease with the condition of respect for nature, shifting part of the responsibility for caring for the environment onto the owners of such resorts.

For example, according to the Maldives laws, the owners of resorts cannot build up more than 20% of the island's territory and are obliged to preserve its nature and ecosystem in its original form because it has the status of a reserve. Thus, almost all Maldives resorts would be tiny if you did not find a solution that suits absolutely everyone - these are eco-friendly water villas located on stilts right above the lagoon and are ideal for a relaxing holiday for tourists. Keeping the environment intact is very important for ecotourism in the Maldives. Tourists come to the Maldives not only to relax but also to see their sheer beauty, as well as admire the endangered coral reefs and their underwater inhabitants. Therefore, the Maldivians are making many efforts to popularize natural beauty, strive to show it to tourists from all sides, not limiting themselves to snorkeling and watching dolphins, but developing diving centers and arranging deep-sea excursions with sharks and rays, as well as organizing exotic and extreme water sports, such as surfing and parasailing.

Summing up, it is worth noting that ecotourism is very important for the Maldives because of its development. The Maldives economy is developing rapidly, the Maldivian culture does not fade away and preserves its traditions, and the richness of the Maldives' nature is preserved in its original form. Combined, all these factors allow us today to call the Maldives a true paradise on Earth, and the tourist infrastructure continues to develop. Furthermore, every year more and more tourists come to hotels in the Maldives to see with their own eyes all the wealth that nature has so generously endowed residents with.

A significant part of the money that every tourist spends during his vacation in the Maldives is preserving these unique islands' nature and the underwater world around them.

Today, many resorts in the Maldives offer not just a luxurious vacation, but the opportunity to make a real escape from civilization and become an ecotourist for a while, disconnecting from the news and walking barefoot on the velvety sand of the world's best beaches in the Maldives. At the same time, it is pleasant to feel like not Robinson Crusoe on a desert island but to relax in comfortable conditions, created taking into account all the most stringent requirements for preserving the pristine nature of the Maldives for posterity.

8. IMPACT OF COVID-19 TO TOURISM INDUSTRY

2019 has been a landmark year for tourism in the Maldives, with tourist arrivals reaching a record 1.7 million. However, on March 27, 2020, the Maldives were forced to close the borders due to the global pandemic. Furthermore, since tourism accounts for 23% of GDP, the country's economy as a whole and the tourism industry have been particularly hard hit by restrictions imposed to curb the spread of COVID-19.

Due to the COVID-19 pandemic happening worldwide, the Maldives overall, and the movement and the travel industry was hit hard. It caused an unprecedented degree of disturbance, in any case. Nevertheless, the Maldives has gotten the 'World's Leading Destination grant' at the "Grand Final of the World Travel Awards 2020" reported at a virtual occasion. This is the first run through the Maldives won the honor throughout the island country's entire existence, which is also the most recognized honor classification of "World Travel Awards". The Maldives contended in this

classification with 22 different objections, including Dubai, Malaysia, Spain, Mauritius, and Sri Lanka. Almost four months after the closure of borders and the suspension of tourist visas, the Maldives reopened to foreign visitors on July 15, 2020, taking all necessary measures to ensure visitors' health. The Ministry of Tourism has issued a guide on safe tourism and has developed a safety and hygiene system for all tourist sites. Now all categories of accommodation facilities have resumed their work - resorts, guest houses, and floating hotels are open to guests, but wearing masks in them is mandatory.

At an online ceremony to mark World Tourism Day, Tourism Minister Abdullah Mausum unveiled the exclusive Maldives Border Miles program to promote tourism in the Maldives. *"The program launched today will increase the country's tourist attractiveness in key markets,"* said Mr. Abdullah Mausum.

Maldives Border Miles is a tourism promotion program initiated by the Immigration Service and developed in collaboration with stakeholders who also attended the ceremony: Ministry of Tourism, Maldives Marketing, and Public Relations Corporation (MMPRC) and Maldives Airports Company Limited (MACL). The program officially was launched on December 1, 2020, and is expected to contribute to the Maldives' tourism sector for the foreseeable future.

Members of the three-tier loyalty program earn points based on the number of visits and length of stay. Additional points will be awarded for visits on special occasions. The program has three levels; Aida (bronze), Anantara (silver), and Abaarana (gold). Each of them has a different set of benefits, incentives, and services that increase in value as you level up.

Speaking at the ceremony, Inspector General of the 'Maldives Immigration Service' Mohamed Ahmed Hussein said: *"The Maldives is ready to welcome tourists and provide them with an unforgettable experience. The front desk is not where tourists start their vacation. Their long-awaited journey begins with the welcome smile of the immigration officer at the border, which opens the first chapter of an unforgettable vacation. Moreover, now that there is a program, we are ready to welcome them with privileges and grant them an unforgettable experience."*

Gordon Andrew Stewart, the CEO and Managing Director of MACL, also noted the benefits of the new program. The Maldives Border Miles is an innovative way to attract travelers from all over the world, and he said, *"and will undoubtedly revitalize the tourism industry hit by the coronavirus. Furthermore, the program provides an excellent opportunity to enjoy their stay on the islands once again and get the best travel experience for those who have already been here."*

9. TOURISM INDUSTRY IN THE MALDIVES AFTER THE PANDEMUC

Since the reopening of borders on July 15, 2020, The Maldives has noticed substantial changes to its key markets. Russia held the top spot as the largest market as of February 3, 2021, with 23% of the market. India came in second place with 21% of the market. Ukraine came in third on the list, providing 7.8% of the market share in the Maldives after the reopening of borders. Kazakhstan (4.9%), France (4.5%), Romania (3.8%), Germany (3.7%), the United Kingdom (2.6%), the Czech Republic (2.2%), and the United States (2.1%) are some of the other major source markets.

The Maldives' tourism industry is currently operating at pre-COVID-19 levels. A total of 170,000 tourists arrived between December 2022 and March 2023, which is the same amount as there were three years before the epidemic. This position is benefiting the economy, which is largely dependent on the tourist sector but is nonetheless hampered by significant public debt.

The Maldives marked a historic milestone in tourism, reaching one million visitors for the year 2023, according to the most recent updates. The Maldives Marketing & PR Corporation (MMPRC), Maldives Airports Company Limited (MACL), Maldives Immigration, and other stakeholders in the

tourism sector organized a special welcome event at Velana International Airport on July 16 to welcome the country's one millionth visitor.

1,016,719 visitors had visited the Maldives as of July 19th, 2023, a rise of 13.4% over 2022 and 7.9% over the same time in 2019. The top five markets during that time were Germany, UK, China, Russia, and India.

10. CONCLUSION

The Maldives, which had 1,192 islands and no foreign investment fifty years ago, has transformed into a tropical paradise with private island resorts. Although there is still a lot of interest in both traveling to the Maldives and developing hotels there, the emphasis with each trip planned and each hotel established is on conserving the genuine beauty that first-time visitors fell in love with in the 1970s.

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Agricultural Sciences

Storage conditions and mycotoxins

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Abstract

Creating an optimal environment during grain storage has only one goal - maintaining grain yield/quantity and quality.

For full/effective grain storage, it is necessary to create environmental conditions that prevent the development of pests and microorganisms. The storage conditions are directly related to the issues of maintaining the quality of grain as raw material, because it is the bacterial and fungal organisms on the surface of the grain that begin to develop as soon as the conditions are favorable for it, on the basis of which the quality of the grain deteriorates, the storage capacity decreases and the yield/quantity of the grain decreases. The growth and development of fungal organisms leads to the accumulation of toxic compounds - toxins in the contents of the grain.

The article discusses the impact of different methods of grain storage on the level of highly dangerous agents mycotoxins and at the same time on the growth of colony-forming units of pathogenic microflora (mesophilic aerobic and facultative anaerobic bacteria).

The research was carried out in the grain storage and drying complex of LTD "Chirina", the largest poultry meat products producer in Transcaucasia.

Keywords: Cereals, storage conditions, mycotoxins, pathogenic microflora.

The relevance of the issue.

Modern technologies and technical means of grain storage give us more and more opportunities to store grain without loss and with preservation of quality for a long time.

The optimal regime is achieved by maintaining specific indicators of humidity, temperature and oxygen supply. In order to store grain, to maintain its mass without loss and quality, it is necessary to adjust at least one of the above-mentioned parameters.

Postharvest losses of grain are 20 to 40%, and storage losses are 5%. The study showed that the world practice uses 4.931 million ha of agricultural land out of the total 14.894 million ha of land surface of the earth. In addition, agricultural production consumes 2.5 trillion m³ of water per year [1].

Traditional storage practices in developing countries do not guarantee grain protection, leading to 20-30% losses, especially post-harvest, due to the proliferation of pests and other pathogenic microorganisms. In addition to causing quantitative losses, grain-borne pests are also associated with aflatoxin contamination and poisoning. To avoid these problems, metal storage facilities called "silos" were created. It is a cylindrical structure building made of galvanized iron sheet and

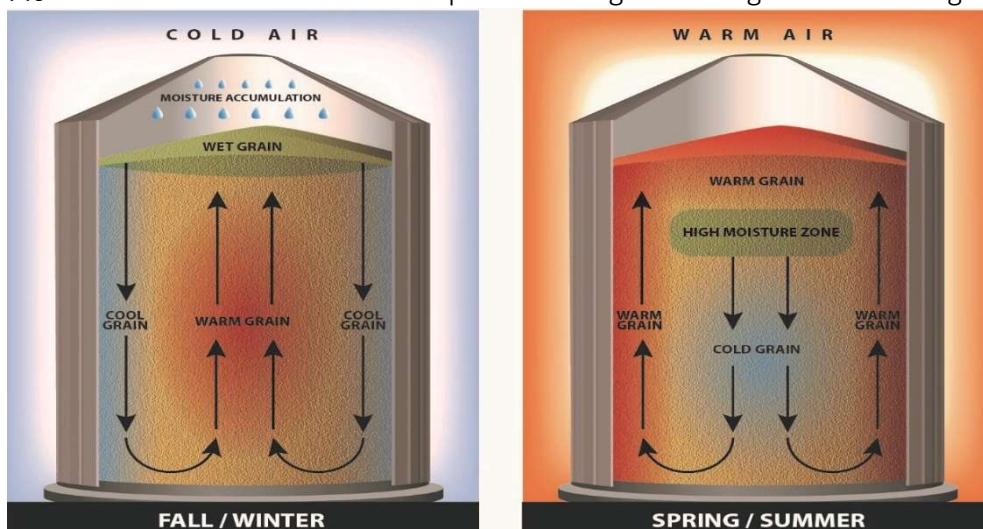
hermetically sealed. It ensures the storage of clothes without loss as much as possible and maintaining quality. Such types of grain storage facilities enable the storage of grain with minimum losses, which at the same time helps to strengthen food security. This is especially important in developing countries. [2]

Grain storage practices and technologies in developed countries are on the verge of transformation. It is driven by advances in information and computing technologies that offer unprecedented opportunities to farmers and grain storage technologists. [4]

A factor to consider when storing grain is seasonality, that is, the influence of winter and summer regimes on the storage of grain mass, especially in the case when the climate cannot be regulated. So, for example, at low ambient temperature, the grain placed in the central part of conveyor-type metal storages/silos keeps heat for a long time, while the layer of grain placed near the wall is cold.

The situation is opposite in summer, the grain placed in the central part of the silo is cold, and the layer near the wall is hot. The temperature of the wheat grain close to the wall is always lower during the cold period of the year and vice versa. The temperature difference in the grain mass causes the air flow to move first towards the central part and then towards the ceiling. Condensation is formed as a result of humid warm air reaching the surface of the cold grain. This leads to an increase in moisture in the grain mass and focal spoilage. (Image #1)

Pic. #1. The effect of seasonal temperature on grain storage in a modern grain store



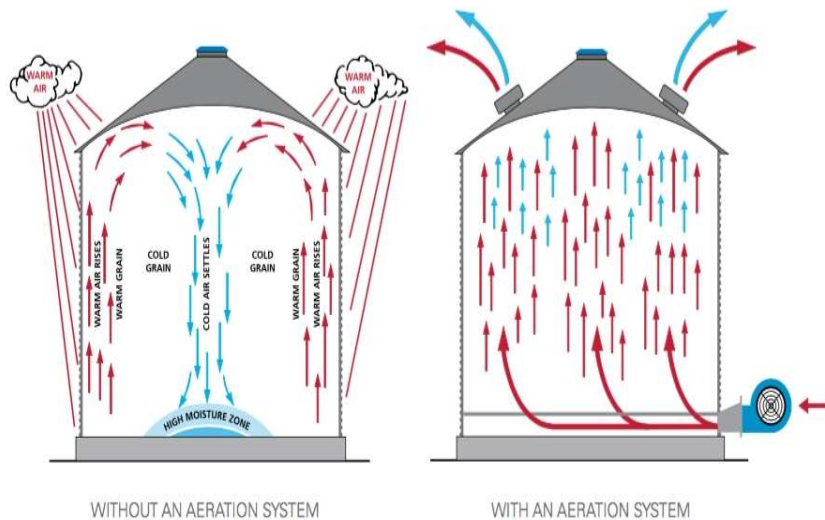
During the migration of moisture between the cold and hot layers and as a result of the condensation, a high humidity layer can be formed in the upper part of the storage during the winter, and in the middle part during the summer.

During grain storage, the moisture content in different parts of the silage is not the same. Due to the change in ambient temperature, it is possible to create zones with high humidity.

One of the downsides to condensation is that there is no real way to get rid of it. High humidity significantly increases the risk of condensation. It is because of the formed condensate that sometimes it is not possible to store grain until the planned time. The way out of these circumstances, as a lifeline, is the presence of a proper aeration system.

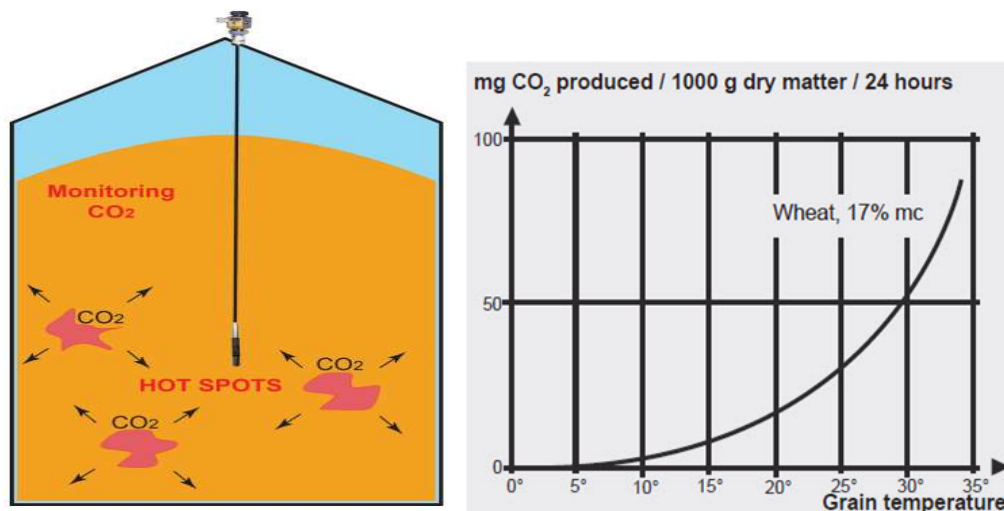
During seasonal temperature changes, it is important how much it is possible to store grain in a cool environment. Processing grain with ventilation (aeration) with a small flow of heat is one of the important measures. The main purpose of aeration is to maintain an even temperature at different points of the grain mass, and it also prevents moisture from migrating to the top (or bottom) of the storage silo based on natural convection. The possibility of ventilation helps to increase the duration of storage (Figure #2) [4] [5]

Pic #2. Effect of ventilation mode on grain weight during long storage period



Very often, during grain storage, a so-called "hot spot" - a localized high temperature zone - is formed in the grain mass. Hot spots can occur anywhere in the reservoir (silo). Usually caused by an infestation that produces excessive amounts of gas in the form of carbon dioxide (CO₂). Grain is a fairly poor conductor of heat, making these hot spots difficult to detect. It is impossible to fix it from the outside. Therefore, thermal imaging is one of the methods used to detect hot spots. This non-contact method involves the installation of several sensors in the silo, which will detect high moderate readings reached up to a certain point (on the basis of which the service operator will take appropriate action). Modern sensors are inserted through the silo roof and its end must be embedded in the grain mass (pic. #3) [5] [6]

Pic # 3 Emergence of hot spots in the granary under the influence of carbon dioxide



A grain, like a living organism, breathes and releases carbon dioxide. As the temperature rises, the respiration process is activated, both for the pathogenic aerobic microorganisms present in the grain and in the mass. Grain respiration is significantly higher than microbial respiration. This physiological process has long been used to measure the metabolic activity of a stored product. The respiration rate can vary depending on the variety, age and quality of the grain. The loss of dry matter is obtained as a result of the use of carbohydrates during respiration. Consequently, respiration data can also be used as a measure of dry matter loss.

The rate of loss of dry matter can become an indicator of grain suitability. It is considered that with a loss of 1% during 12 months, the grain is suitable for animal feed. [6] [7] [8]

Due to the fact that there are many opinions regarding the determination of the need for aeration cooling and aeration drying, it is necessary to compare how these two processes differ from each other. A relatively low air velocity is required to cool the grain. About 2-4 liters of air per second/ton. Whereas grain drying requires much higher air flow rates, more than 15 liters of air per second/ton.

When using cooling aeration, the grain can be cooled even by 10° degrees Celsius, which significantly reduces the risk of fungi and mycotoxins.

When storing grain mass, moisture is of crucial importance, because excess moisture is a favorable condition for the activation of all vital processes, including pathogenic microflora. [9]

Reproduction of stored grain fungal organisms, accumulation of toxins, and grain spoilage are possible when the water activity (moisture) in the grain mass exceeds a critical threshold, which in turn promotes the growth of mycotoxin-producing fungi. (Some mushroom species are known to produce harmful mycotoxins). The most harmful toxigenic species include xerophilic species (genera *Aspergillus* and *Penicillium*, *Fusarium*). Because mycotoxin contamination of grain is a worldwide problem, ongoing monitoring of mycotoxin content and product detoxification is a constant concern for public health and the grain food industry. This is why tolerable levels of mycotoxins are strictly regulated worldwide.

Based on the above, the integrated management of fungal organisms in stored grain is based on four pillars:

1. Prevention of the development of fungal organisms - by keeping the grain moisture below the critical limit of fungal growth;
2. Accurate monitoring of grain and temperature changes during the storage period, which is related to the monitoring of early indicators of respiratory activity of storage fungi;
3. Cleaning of grain mass from mechanical impurities;
4. It is possible to use biocompetitive strains of fungi or bacteria to prevent the development of mycotoxigenic fungi in grain bulk - although this is a topic for future research.

Pests, fungi, bacteria are one of the biggest problems in grain storage.

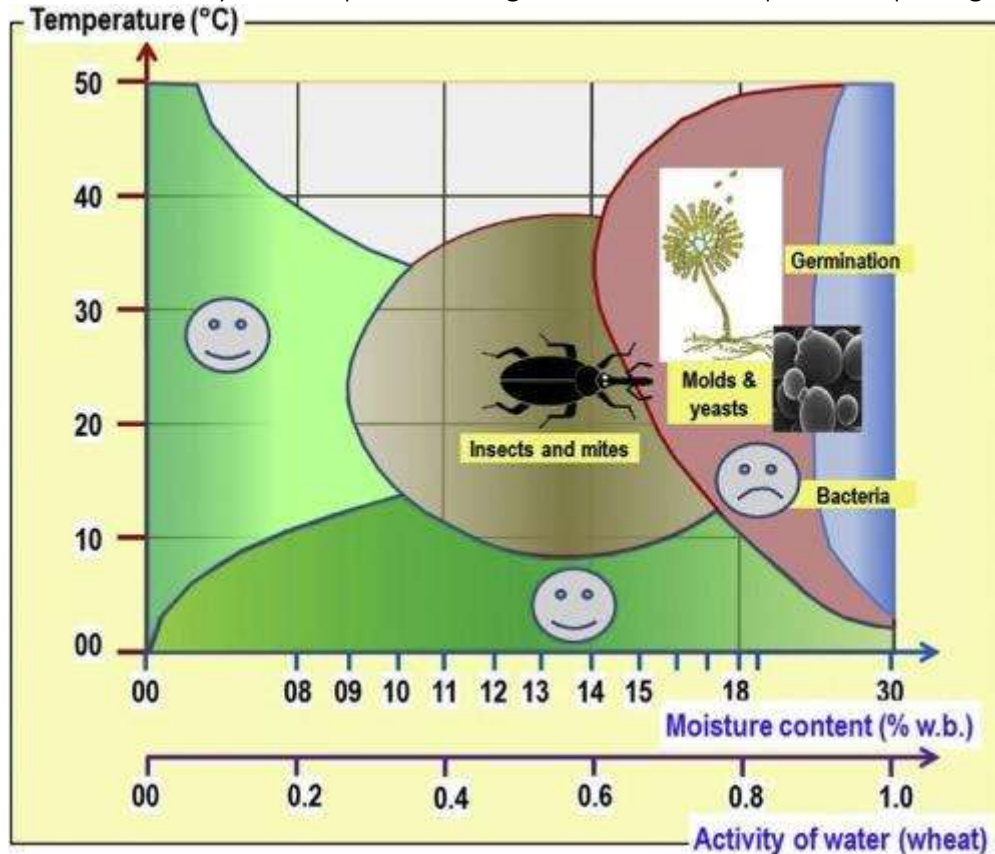
The first measure to be taken is prevention. Which means maintaining a healthy surface of the grain and the absence of fungal diseases.

In most cases, the grain mass is more or less damaged by fungal diseases. At this time, it is very important to know the characteristics of the development of fungal diseases and grain pests.

From 0 to 50 °C the grain mass is ideally stored when the humidity is 9%.

From 9% humidity to 20°C pests begin to develop well. For the development of fungal organisms, a moisture content higher than 15% and a temperature of 20 to 50 °C are needed in the grain.[9] (picture #4)

Pic. #4. Humidity and temperature range of distribution of pests and pathogenic microorganisms.



<https://www.sciencedirect.com/science/article/abs/pii/S0022474X16300911> (Integrated management of the risks of stored grain spoilage by seedborne fungi and contamination by storage mould mycotoxins – An update - Journal of Stored Products Research Volume 71, March 2017, Pages 22-40)

When the desired moisture level is violated, one of the main measures is to dry the grain mass to the standard moisture content.

When drying the grain, it is necessary to take into account the fact that all metabolic reactions in the grain are related to its moisture content. Through micro and macrocapillaries in the grain, moisture circulates in the form of a liquid to the surface of the grain and vice versa.

Therefore, the active surface of the grain, where the exchange of moisture with the environment takes place, is almost a thousand times greater than the geometric surface of the grain. The moisture present in the grain is found in different forms and connections. This connection can be conventionally divided into three groups: chemical, physico-chemical and mechanical. In the process of drying, the moisture that is in mechanical connection with it is removed from the grain, often this applies to physical-chemical connections as well. Even after drying, there is always moisture in the grain, the amount of which depends on the ratio of dry matter to water mass. Grain moisture is expressed as a percentage of moisture relative to dry matter.

The process of moisture transfer between the grain and the drying agent is carried out through the surface of the grain, so the condition of the surface of the grain is of great importance. Which is more than 1 kg. The surface of the grain mass, the more efficient the drying process is, therefore, the finer the grain, the more intensively it dries.

The influence of the drying agent temperature on the organic substances in the grain (proteins, fats, carbohydrates, enzymes and vitamins) is very important. Grain with 14% moisture can

withstand heating only up to 60-65 degrees. Due to the influence of higher humidity or high temperature, the sowing value of the seeds decreases, starch and proteins are destructured, the structure of the gluten structure changes, the number of fatty acids increases, the activity of enzymes is inhibited, and the commercial value of the grain decreases and deteriorates.

In addition to biochemical changes, structural and mechanical changes are taking place: the skin of the grain breaks and the grain is deformed. This breaks the integrity and structure. The content of the grain becomes easily accessible to pathogenic microorganisms.

The purpose and objectives of the research. The aim of the research was to study the concentration of mycotoxins in grain samples taken from five grain-producing regions of Georgia (Kakheti, Kartli, Samegrelo, Imereti, Guria).

a) to observe the stored grain, whether the content of mycotoxins changed, taking into account the storage conditions, and to express all this in a numerical indicator.

b) at the same time, to study the dynamics of bacterial background changes in grain mass depending on grain moisture and duration of storage.

Scheme of the test:

Option 1 - The grain was stored in the form of embankment for 6 months, with an acceptable concentration of mycotoxins in it

Option 2 - The grain was stored in polyethylene film under vacuum

Option 3 - The grain was stored in modern granaries of Metal with ventilation mode

Option 4 - The grain was stored in a metal granary without ventilation.

Initial state of grain: normative (Mycotoxin Regulations For Feed in The EU EC No. 32/2002 Directive of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed)

Research material and methods.

The research material was grain (corn, wheat), sampling was carried out taking into account the methodology, in accordance with the regulation. ("Approving the technical regulation on sampling and analysis methods for the determination of mycotoxins" Resolution of the Government of Georgia No. 497 of November 7, 2016, effective date 01/01/2018)

Samples for different mycotoxins were taken separately from each batch to be evaluated. Aokin spectrometer was used to determine the amount of mycotoxins, Perten DA 7200 tool was used to determine the chemical composition of combined food. Spectral method was used for research. Mesophilic aerobic and facultative anaerobic microorganisms were determined using the microbial cultivation method. The analysis will be conducted in the accredited laboratory of "Chirina" LLC.

Accumulation of mycotoxins in grain mass depending on storage conditions

Storage conditions Mycotoxin	DON (Microgram-ppb/kilogram)				ZON (Microgram ppb/kilogram)				AFLA B1 (Microgram ppb/kilogram)				T2 HT2 (Microgram ppb/kilogram)			
	Corn		Wheat		Corn		Wheat		Corn		Wheat		Corn		Wheat	
	№1	№2	№1	№2	№1	№2	№1	№2	№1	№2	№1	№2	№1	№2	№1	№2
Option 1 - the grain was stored in the form of embankment for 6 months	120	860	111	970	320	420	230	130	5	3.2	2.1	0.9	120	180	115	390
Option 2 - the grain was stored in polyethylene film under vacuum	400	620	230	320	200	80	90	430	1.6	0.1	0.9	0.5	290	150	210	200
Option 3 - grain was stored in modern Metal granaries with ventilation mode	120	70	650	890	180	300	300	310	1,9	0.7	3.2	3.5	310	200	390	180
Vatiant 4 - grain was stored in a metal granary without ventilation.	120	80	200	420	210	380	180	200	0.6	1.7	5.1	2.2	90	140	500	270

Research results in production conditions

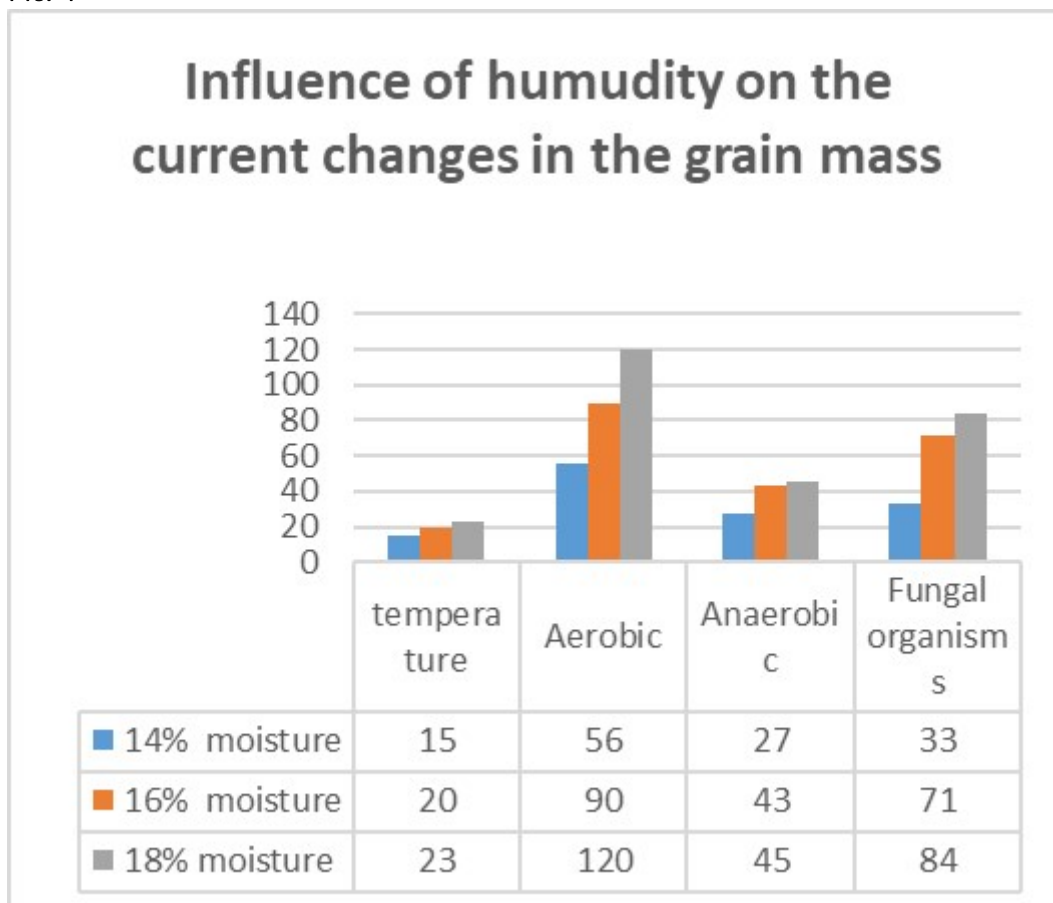
1. As can be seen from the table, the trend of increase of mycotoxins was observed in option 1, where the grain was stored in the form of embankment. Accordingly, the growth of fungal organisms in the bulk of stored grain is more pronounced, which is due to the activation of fungal organisms caused by the interaction of the large surface of the grain mass with air.

2. The lowest increase in mycotoxins was observed in option 3, where the grain was stored in a metal granary with the possibility of using an active mode of ventilation.

Based on the research results, we can make the following conclusions:

- The growth of mycotoxin-producing species is closely dependent on grain moisture content. The higher the humidity above +14°C, the higher the overall bacterial contamination on the grain surface. Growth of aerobic bacteria and fungal organisms (Figure #5)

Pic. 4



Influence of humidity on changes in grain mass

	Temperature	Aerobic	Anaerobic	Fungal Organisms
14% humidity	15	56	27	33
16% humidity	20	90	43	71
18% humidity	23	120	45	54

1. The grain must be in the phase of physiological maturity. Harvesting of grain should be done in a tight time frame and taking into account the weather conditions to avoid excess moisture in the grain. (The ideal moisture content for harvesting is below 20%)
2. Recommended storage temperature is 15-20°C temperature range.
3. It is recommended to keep the grain mass moisture at 12.5%. The upper limit should not exceed 14%. The increase of humidity above the mentioned index leads to problems during the storage period, the result of which is grain mouldy, heating red-hot and an increase in the concentration of mycotoxins.
4. Prevention of mycotoxigenic fungal spoilage of stored grain is possible with a preventive strategy that includes integrated approaches combining different methods, materials and practices

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(Integrated management of the risks of stored grain spoilage by seedborne fungi and contamination by storage mould mycotoxins – An update - Journal of Stored Products Research Volume 71, March 2017, Pages 22-40)

YABANI HALDA AZƏRBAYCANDA YETİŞƏN ÇAŞIR BİTKİSİ (PRANGOS FERULACEAE L.) SAPLAQLARINDA MİNERAL TƏRKİBIN VƏ PEKTİNMETİLESTERAZA FERMENTİ AKTİVLİYİNİN KONSERVLƏŞDİRMƏDƏ İSTİFADƏ MƏQSƏDİLƏ ÖYRƏNİLMƏSİ

QURBANOV NÜSRƏT HEYDƏR oğlu

t. e. n., dosent (UNEC)

TAGIYEV MƏRDAN MƏHƏRRƏM oğlu

t. e. n., dosent (ATU)

QULUZADƏ NƏRMİNƏ HAMİL qızı

bakalavr (UNEC)

AZƏRBAYCAN DÖVLƏT İQTİSAD UNİVERSİTETİ (UNEC)

AZƏRBAYCAN TEXNOLOGİYA UNİVERSİTETİ (ATU)

ANNOTASIYA. Beynəlxalq səviyyədə yabani halda yetişən çaşır (Prangos) cinslərinin yayılması və qısa təsnifat xarakteristikası ədəbiyyat mənbələri əsasında təhlil olunmuşdur. Azərbaycan Respublikasında qidalanmada geniş yayılmış adi çaşırın (Prangos ferulaceae L.) saplağı konservləşdirmədə istifadə məqsədilə tədqiq edilmişdir. Rentgenflüoressensiya metodu ilə saplağın mineral tərkibi və pektinmetilesteraza fermenti aktivliyi pH və temperatur reyimindən asılı olaraq öyrənilmişdir. Alınan məlumatların texnologiyada istifadəsi tövsiyə olunur.

AÇAR SÖZLƏR: Çaşır (Prangos) cinsləri, adi çaşır (Prangos ferulaceae L.), mineral tərkib və PME aktivliyi.

Yabani halda yetişən, yeyilməyə yararlı bitkilər arasında 1000-ə yaxın tərəvəz, yarmalı, nişasta daşıyıcı, zülallı, şəkərli, ədviyyəli bitkilər respublikamızın florasında geniş yayılmışdır. Bununla belə, texnoloji istifadə qaydalarını tam bilmədiyimiz üçün, həm də təhlükəsizlik baxımından biz onlardan az istifadə edirik.

Bu bitkilərdən istifadə təkcə qida rasionu kaloriliyinin artması üçün deyil, həm də qidanın dad keyfiyyətinin yaxşılaşdırılması, xörək və məmulatların vitaminlə, makro- və mikroelementlərlə, həmçinin digər faydalı birləşmələrlə zənginləşməsi üçün lazımdır. Ata-babalarımız müxtəlif xəstəliklərin müalicəsi üçün onlardan əsrlər boyu istifadə etmişlər. Bunlardan biri də, ta qədimdən xalqımıza bəlli olan və evdə qidalanma üçün işlədilən və mövsümi xarakter daşıyan çaşır (Prangos ferulaceae L.).

Yabani bitən yetişən bitkilərin öyrənilməsinin əsas aspekti insanların rasional qidalanmasının təşkilində istifadəsinə, eyni zamanda müalicəvi rol oynamasına görə onların çox dəyərli hesab olunmasından ibarətdir. Onlarda olan əsas bioloji aktiv maddələrdən hətta həyat katalizatoru kimi hormonlar və s. birləşmələr də vardır. Belə bitkilərin tipik nümayəndəsi kimi müalicə və qida əhəmiyyətli adi zoğlu çaşırı göstərmək olar ki, xalq təbabətində ta qədimdən məlum olmasına baxmayaraq, müasir qidalanma baxımından funksionallığına görə hələ də tam tədqiq edilməmişdir.

Ona görə də yabanı bitkilərin, o cümlədən çəşir tərki binin və emal zamanı dəyişilməsinin tam öyrənilməsi, onların qorunması və rasional istifadəsi məsələləri baxımından qarşıya qoyulan vacib məsələlərdən sayılır.

Yabanı bitkilərin tərki binində sağlamlıq üçün lazım olan və orqanizmin normal inkişafını təmin edən elə maddələr vardır ki, bunlar qida ilə qəbul olunduqda orqanizmin bütün üzvlərinin fəaliyyətini artırır, onun möhkəmlənməsinə kömək edirlər. Bu baxımdan, təbii sərvətimiz olan Prangos ferulaceae L.-in – adi çəşir, qida və dərman bitkisi kimi tərki binin tam öyrənilməsi, onun dərinədən araşdırılması, funksional əhəmiyyətli qida rasionlarında işlədilməsi istiqamətində aparılan eksperimental tədqiqat kimi əhəmiyyətli məsələlərdəndir.

Mövzunun aktualığı

Prangos cinslərinin sistematikasını üzrə sanballı elmi tədqiqat işlərindən biri kimi Moskvada M.Ç. Pimenovun rəhbərliyi altında botanika ixtisası üzrə (03.01.01) yerinə yetirilmiş namizədlik dissertasiyasını qeyd etmək düzgündür (Lişkov Dmitriy Fyodoroviç – Систематика рода Prangos Umbelliferae, Apoibeae и сближаемых таксонов: сопоставление морфолого-анатомических и молекулярных данных, 2015). Burada qeyd olunur ki, bitkinin bu cinsi üzrə tədqiqatlar XIX əsrin klassikləri sayılan Candolle və Boisserin hələ 1830, 1844, 1849, 1856, 1860, 1872-ci illərdə apardığı elmi işlər əsasında qurulmuşdur. Bununla belə, bu cins daxilində sistemləşdirmə 1962-ci ildə rus alimi L.V.Kuzmina tərəfindən təklif olunsada, bu istiqamətdə sanballı monoqrafiya İsrail alimləri (Herrustadt Heyn, 1977) tərəfindən işlənilib hazırlanmışdır. Sonrakı illərdə bu cinsin Türkiyədə, Orta Asiyada yeni növləri aşkar olunaraq tədqiq olunmuşdur. Bunların əksəriyyətinin morfoloji göstəriciləri ümumiləşdirilərək təsnifləşdirmə üçün əsas götürülmüşdür.

Qeyd olunur ki, Prangos cinsinin bütün növləri qiymətli dərman bitkiləri və yem (heyvanlar üçün) obyektini kimi qəbul olunmuşdur. Bütün bunlara baxmayaraq, Prangos cinsinin növləri insan qidalanmasında tətbiq olunma üçün geniş öyrənilməmişdir. Ona görə qarşıya qoyulmuş tədqiqat işində bir sıra ölkələrdə, o cümlədən Azərbaycanda yerli əhali tərəfindən ev konservləşdirilməsində və kulinariyada məşhur olan adi çəşir (Prangos ferulaceae Lindl) növünün innovativ üsulla konservləşdirilmiş məhsul alınması nöqtəyi-nəzərinə tədqiqi aktualdır.

Çəşir (Prangos) cinslərinin botaniki xarakteristikası, müalicə və qida əhəmiyyəti.

Prangos (latınca Prangos) toxumları ikiyüvalı bitkilərdən olub, Çətirçiçəklilər (Apiaceae) fəsiləsinə aid edilir. O, ilk dəfə Britaniya botaniki Con Lindli tərəfindən 1825-ci ildə qeydə alınmışdır. Elmi təsnifatda prangos Eukariotlar aləminə aid edilir. Kərəvüzkimilər yarım fəsiləsindəndir. Prangos ferulaceae L isə onun cinsinə aiddir. Bitkinin beynəlxalq elmi adı 1825-ci ildən Prangos Lindl adlandırılmışdır. Onun xalq arasında adı çəşir (şəşir), yuqan, yaxud yuqon kimi də səsləndirilir.

Bu cinsin nümayəndələri ən çox mərkəzi və cənubi-qərbi Asiyada və Aralıq dənizi ölkələri ərazisində rast gəlinir. Çəşir çoxillik ot bitkisi olub, kökləri konusvari, uzunsov, ağacquruluşludur. Budaqları (gövdəsi) düz inkişaf edən, şaxələnmiş şəkildədir. Yarpaqların ucu iti, qanadşəkilli xəttidir, yuxarı hissədəki yarpaqlar isə kiçik ölçüdə olurlar. Çiçəkləri çətirlərdir. Gülləri ağ yaxud sarımtıl rəngli ləçəklərdən ibarətdir, ellips yaxud yumurtavari formadadırlar. Meyvələri uzunsovdan ellips formasına oxşar qanadlar şəklində olurlar.

Elmi məlumatlar çəşir 45 növə malik olduğunu göstərsə də, hazırda bitkilərin təsnifatında (The Plant List) olan baza informasiyasına görə Prangos cinsinin 19 növü vardır (Buna baxmayaraq, son tədqiqatlarda dünya üzrə onun 48 növə malik olduğu iddia edilir).

Botaniki məlumatlara görə bitkinin 35 növü Aralıq dənizi, Qərbi, Orta və Mərkəzi Asiya və Himalay zonalarında yayılmışdır. Keçmiş SSRİ məkanında isə onun yemlik növü daha çox quru dağ ətlərində yetişir. Yem çəşiri, yaxud yuqanın (P.pabularia) Orta Asiyada geniş yayılan cəngəllikləri vardır. Kimyəvi tərki binə görə onun 2 müxtəlif forması: şirin yuqan (yarpaqları heyvanlar tərəfindən quru ot kimi həvəslə yeyilir) və acı yuqan məlumdur. Onların hər ikisinin kökündə kumarin və onun

törəmələri olur. Bəzən prangos cinsinə kaxris (*Cachrys*) növü də daxil edilir. Azərbaycanda yayılan çəşir cinsi növləri içərisində ferulaşəkilli çəşir (*P.ferulacea* Lindl) çoxillik bitki kimi insanlar tərəfindən qida məqsədilə tə qədimdən istifadə olunur. Bu növ çəşir 60-150 sm hündürlükdə budaqlanmış şəkildə bitir. Kökünə yaxın olan yarpaqları 20-45 sm uzunluqda boy atır. Qafqazda bu növ geniş yayılmışdır. Əsasən daşlı-çınqıllı yerlərdə yetişir. Ümumilikdə bütün çəşir cinslərinin yarpaqları, xüsusilə yem çəşiri 0,01%-0,1% miqdarda alkaloidlərə malik olur, gülləri efir yağı toplayır.

Alkaloidlərin miqdarına görə məhz çəşirin yem kimi, ya da zəhərli bitki kimi qiymətləndirilməsi aparılmışdır. Ədəbiyyatda (R.H.Vbythdek, 1958) göstərilir ki, türkmənlərin yerli əhalisi bu xüsusiyyətlərinə görə yem çəşirini seçib heyvanlar üçün tədarük edirmişlər.

Azərbaycanda, yeyilən çəşirin (*Prangos ferulaceae* L.) növləri içərisində onun zəhərli formalarına da rast gəlinir.

Qoyunlar üçün belə bitkinin zəhərli dozası 7-9 kq-a çatır. Müalicə üçün bu halda onlara süd içirdirlər.

Mərkəzi Asiya xalq təbabətində yuqan çəşirini stimullaşdırıcı, mədə üçün, sidikqovucu və abortiv vasitə kimi işlətməmişlər. Onun köklərini isə qadın və dəri xəstəliklərində tətbiq etmişlər. Yuqan çəşirindən alınmış neycedanin adlı birləşməni 1964-cü ildə dərmanların tərkibində yaman şişlərə qarşı təsiri gücləndirmək üçün işlətməmişlər. Yaxud pastinaçin adlı maddəni spazmolitik və damargenişləndirici vasitə kimi nevroza qarşı müasir təbabətdə işlədirlər. Çəşirin tərkibindən alınan Berqapten adlı preparat isə arterial təzyiği aşağı salır. O da məlumdur ki, çəşirin kökündən alınan ekstraktlar təbabətdə qipoqlikemik və qipolipidemik vasitə kimi işlədilmişdir. Çəşir ekstratları şəkərli diabet xəstəliyində qaraciyər dağılmasının qarşısını alır.

Yem çəşiri – *Prangos pabularia* Lindle kökünə görə müalicəvi məhsul kimi Tacikistanın Hissar zonasında geniş yayılmışdır. May, iyun aylarında çiçəkləyir, iyun-avqustda isə meyvə verir. Bu cins çəşirə Qıgızıstanda da rast gəlinir. Burada bitkini ayıtükü (ayı saçı), yuqan adı ilə də işlədirlər. Onun kökünün tərkibində smola, aşılavıcı maddələr, nişasta, kumarin törəmələri toplanır. Lakin nəzərə almaq lazımdır ki, yuqanın preparatları qıcıqlandırıcı və antiseptik təsirə malik olurlar. Çəşirin kökünün həlimi ilə heyvanlarda və insanlarda çəşinmanı müalicə etmişlər. Onun həlimi yod və spirt qarışığı ilə nastoyka şəklində dişin desnaları və parodontozunda müalicə məqsədilə işlədilir.

Pranqosun növləri müxtəlif ölkələrdə həm də dekorativ bitki kimi işlədilir.

Prangos ferulacea (L.) Lindl cinsinə aid olan çəşir - xalq təbabətində bir çox xəstəliklərin müalicəsində istifadə olunan qiymətli dərman bitkilərindən biridir. Müxtəlif laboratoriya tədqiqatları onun müalicəvi xüsusiyyətlərini nümayiş etdirmişdir. *P.ferulacea* yumşaldıcı, mədə-bağırsaq xəstəlikləri üçün tonik, antifatulent, sedativ, iltihab əleyhinə, anti-viral, antihelminthic, antifungal və antibakterial təsirə malikdir. Bundan əlavə, *P.ferulaceae* bitkisinin yarpağı mədə-bağırsaq xəstəlikləri üçün də istehlak olunur və onun kökü sərtliyin müalicəsi və cinsi istəyi gücləndirmək üçün istifadə olunur. *P.ferulacea* -nın digər xüsusiyyətləri arasında dözümlülüyün artması, lümenlərin daralması və maneələrinin açılması, böyrək və mesane daşlarının qırılması və dalağın şişkinliyini azaltmaq və s. göstərmək olar. Bununla yanaşı, bu bitkinin insan xəstəliklərinin müalicəsində istifadə edilməsi üçün klinik tədqiqatlar lazımdır. Morfoloji və biosistematik xassələrinə görə fərqlənən *P.ferulacea* Umbellales ailəsinin üzvü, Umbelliferae (*Apiaceae*) ailəsinə də aid edilən *Prangos* cinsi də malikdir. O uzunluğu 80-200 sm-ə çatan və çox qalın, budaqlı qolları və əks budaqları olan çoxillik, perpendikulyar bir bitkidir. Yarpaqları yaşıl, tutqun, nadir hallarda kobud, geniş və əsasən bölünmüş, xətti hissələrə malikdir. Çiçəkləri sarıdır və 6-12 sm radiuslu toplanır. Meyvələri isə yumurtavari və toxum diametrindən daha incədir. Çiçəklənmə müddəti may-iyul aylarıdır. *P.ferulacea* Elbrus ətəklərində, şərq və qərbdə, İranda və Azərbaycanda və s. yerlərdə rast gəlinir. *Prangos* cinsi təxminən 45 növündən 5-i müvafiq olaraq İranda və ölkəmizdə yetişir və bu yerlər çəşir üçün doğma yerlərdir. İranla yanaşı, bu cinsin digər növləri Şərqi Avropada Türkiyə, Qafqaz və Orta Asiyaya yayılmışdır. İranda *Prangos* Şərqi Azərbaycan, Qərbi Azərbaycan,

Kürdüstan, Kermanşah, Həmədan, Semnan, İsfahan, Lorestan əyalətlərində, Elbrus dağlarının cənub ətəkləri və Fars əyalətlərinin əksər dağlarında yayılmışdır. Fitokimyəvi tədqiqatlar Prangos növlərində bəzi kumarinlərin, alkaloidlərin, flavonoidlərin və terpenoidlərin aşkarlanmasına və çıxarılmasına səbəb olmuşdur. *P.ferulacea* toxumlarının araşdırılması bu bitkinin yağında 33 birləşmənin aşkarlanmasına səbəb olmuşdur. Bu bitkinin meyvəsinin efir yağında 39 birləşmə aşkar edilmişdir. Tədqiqatlar birləşmələrin miqdarının və ekstrakt tərkib hissələrinin nisbətinin əsasən bitkinin genotipindən, inkişaf və böyümə mərhələsindən asılı olduğunu göstərmişdir. İranın əksər ərazilərində bu bitki qışda yem verən əsas bitkilərdən biri hesab olunur. Bəzi insanlar *P.ferulacea*'ni mal-qaranı bəsləmək üçün yosunlardan üstün tuturlar. *P.ferulaceae* mal-qara tərəfindən bilavasitə yeyilmir, əksinə, qışda yem olaraq istifadə etmək üçün doqranır və qurudulur. Tədqiqatlar göstərir ki, müxtəlif mal-qara (inək, qoyun və keçi) heç bir böyümə mərhələsində *P.ferulacea* ilə otlamır. *P.ferulaceae*nin yaşıl ekstraktlarında kumarinlərin çox olması və onların xoşagəlməz qoxusu, ehtimal ki, *P.ferulaceae*nin müxtəlif böyümə mərhələlərində heyvanlar tərəfindən otlanmasına mane olur. Türkiyədə aparılmış bir araşdırmada *P.ferulacea*'nin kimyəvi parçalanması bu bitkinin enerjili yem olaraq istifadə edilə biləcəyini göstərmişdir. *P.ferulacea* antioksidantların zəngin mənbəyidir. Digər bir araşdırmada isə *P.ferulacea*'nin qoruyucu və antioksidant təsirlərinin α -tokoferol (vitamin E) ilə müqayisədə daha yüksək olduğu göstərilmişdir. Bundan əlavə, *P.ferulacea*'nin fenollu birləşmələri bu bitkinin antioksidant xüsusiyyətlərini təsdiqləyir. Digər araşdırmalarda *P.ferulacea*'nin diabetlə əlaqəli böyrək və qaraciyər çatışmazlıqlarının bərpasına müsbət təsiri göstərilmişdir. Böyrək pozğunluqlarının öyrənilməsi, bitki kökü ekstraktının diabetlə əlaqəli biokimyəvi və histoloji fəsadların bərpasında effektivliyini izah edə bilər. Çəşir ekstraktının *Bacillus cereus*, *Bacillus subtilis*, *Micrococcus luteus*, *Staphylococcus aureus* və *Listeria monocytogenes* kimi bir neçə müsbət qram bakteriyalara qarşı antibakterial təsiri tədqiqatlarda tam əsaslandırılmışdır. Xalq təbabətində *P.ferulacea* diş ağrısı, sümük qırılması səbəbindəki ağrı, oynaq ağrıları, qançırılar, baş ağrısı, əzələ ağrısı və s. daxil olmaqla, bir çox ağrıları azaltmaq üçün sedativ olaraq istifadə olunur. Digər bir işdə *P.ferulacea* ekstraktında saponin, antrakinin, tanin və flavonoidlər kimi bəzi birləşmələrin mövcudluğu onun analgetik təsirinin potensial səbəbləri kimi təklif edilmişdir. Beləliklə, *P.ferulacea*, geniş tibbi xüsusiyyətlərə malik olan dərman bitkilərindən biridir və bir sıra hallarda ənənəvi tibbdə istifadə edilmişdir. Belə bir mürəkkəb tərkibə və dərman xüsusiyyətlərinə malik olması gələcəkdə bu bitkinin insan xəstəliklərinin müalicəsi üçün dərman kimi istifadə olunmasının faydalı və naməlum təsirlərinin daha da müayinəsinə zəruri edir.

Tədqiqat obyektinin və metodlarının xarakteristikası

Tədqiqat obyektini kimi ölkənin Yardımlı zonasında yabanı yetişən və Bakının Nəsimi bazarında satılan, 2022-ci ilin aprel məhsulu kimi adi çəşir (*Prangos ferulaceae* L.) saplağından istifadə olunmuşdur (bax şəkil 1).



Şəkil 1. Təzə yığılmış çəşirin saplaqları

Pektin maddələrinin miqdarca öyrənilməsi kalorimetrik karbazol metodu ilə, PME aktivliyinin dəyişilməsi isə alman metodu ilə aparılmışdır (şəkil 2).

Eksperiment nəticələri 3-5 dəfə təkrarlanmaqla orta arifmetik qiymətin $\bar{x} = \frac{\sum xi}{n}$ təyin edilməsi ilə müəyyənləşdirilmişdir.

$\sum xi$ – müşahidə olunan göstəricilərin cəmi; n – paralel aparılan təcrübə müşahidələrinin sayıdır.

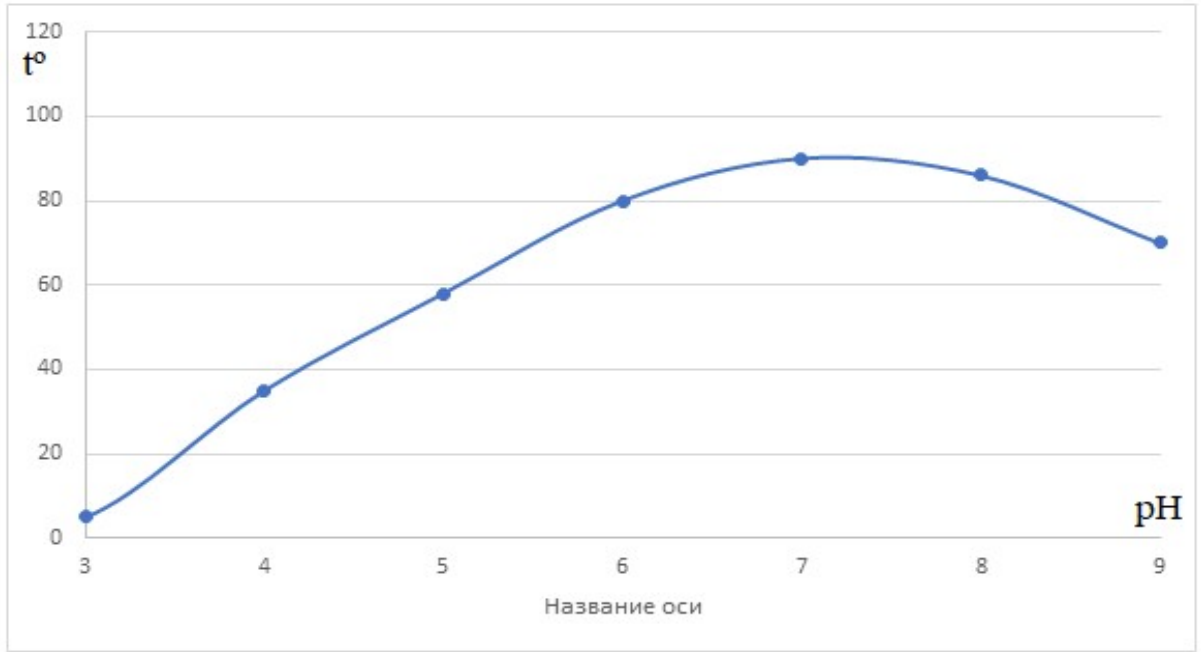
Çəşirin tərkibində olan mineral maddələrin miqdarı müasir və tanınmış rentgen-flüoressensiya metodu ilə aparılmışdır. Nəticələr şəkil 3-də göstərilmişdir. Məqalənin həcmninin böyüklüyü səbəbindən eksperiment nəticələrini sxemlərdə göstərməklə kifayətlənirik.

Çəşirdə PME (pektinmetilesteraza) fermenti aktivliyinin təyini

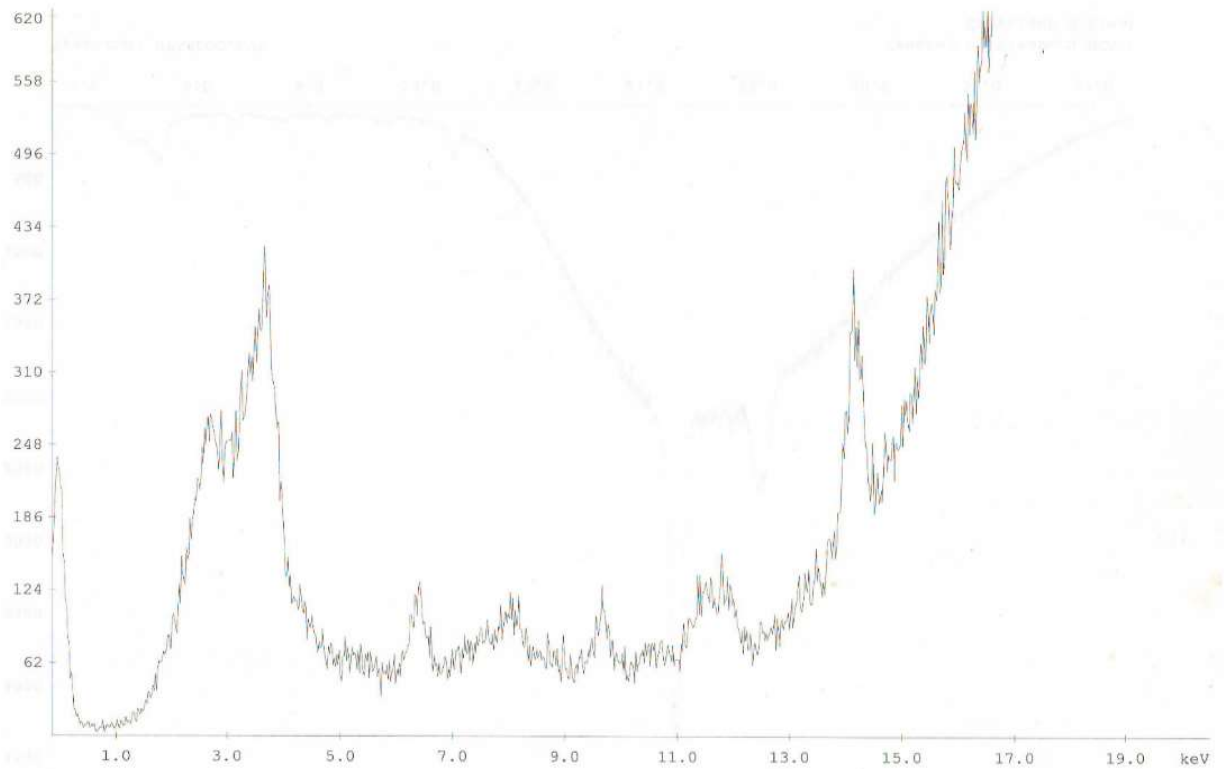
150 mq aseton 5 ml 5%-li xörək duzu məhlulu ilə qarışdırılır və qarışıqın pH-ı 9,0 qiymətinə qədər nizamlanır və qarışıq yaxşı çalxalanır (20 dəq.) sonra isə məhlul süzgəc kağızında süzülür. Bundan sonra əzilmiş çəşir nümunəsi filtratla qarışdırılır. Son qarışıqın pH-ı isə 7,5-ə çatdırılır.

Bundan sonra standart pektin məhlulunda karbazol reaksiyasına görə kalibrə əyrisi qurulur və çəşirin tərkibindəki pektin maddələrinin miqdarı və dəyişilməsi, eyni zamanda pH və temperaturdan asılı olaraq otaq temperaturunda PME aktivliyindən asılı olaraq həll olan pektinin miqdarı təyin olunur.

Prinsip qalakturon turşusunun təyin olunmuş miqdarına görə PME aktivliyinin təyin olunmasından ibarətdir. Bu isə tərkibində ferment olan məhlulda pH və temperaturdan asılı olaraq həll olan pektinin miqdarının necə dəyişilməsi ilə qiymətləndirilir. Aktivlik hər 100 ml məhlula və tərkibdə olan çəşir materialına görə mq-la hesablanıb qrafikə köçürülür. Bu isə şəkil 2-də göstərilmişdir.



Şəkil 2. Çaşır saplağında PME fermenti aktivliyinin pH-dan və pektin maddələrinin miqdarından asılı olaraq dəyişmə qrafiki (qızdırılma müddəti 15 dəq. olmuşdur)



Şəkil 3. Rentgenflüoresensiya metodu ilə çaşırda mineral maddələrin təyin olunma spektrləri

Əldə olunan məlumatların elmi cəhətdən əsaslandırılmış izahı

Yuxarıda qeyd etdiyimiz kimi istehsal müəssisələrində və ev şəraitində ekoloji cəhətdən təmiz qida məhsulları resepturaları və texnologiyaların işlənməsində yabani halda yerləşən qida və müalicə əhəmiyyətli faydalı bitkilərdən istifadə edilməsi aktual məsələlərdən hesab edilir. Bunların hamısı qida rasionlarında zülal və qida liflərinin çatışmazlığının aradan qaldırılması, onların bioloji aktiv maddələrlə zənginləşdirilməsi məqsədi daşıyır və son nəticədə xüsusi dad xüsusiyyətlərinə

malik yeni məhsulların yaradılmasına gətirib çıxarır. Ot şəkilli tərəvəz bitkilərinin böyük əksəriyyətinin müalicə profilaktiki xassələrə malik olması isə onlara diqqəti daha da artırır.

Belə bitkilər içərisində yabanı halda ölkənin əksər rayonlarında (Yardımlı, Dəvəçi, Naxçıvan Muxtar Respublikası, qədim Zəngəzurun daxil olduğu əksər rayonlarda) yetişən çəşir - Prangos ferulaceae qiymətli qida xammalı kimi ta qədimdən dədə və babalarımız tərəfindən ev konservləşdirilməsində geniş işlədilir və bu iş bugünə qədər davam edir. Heç də təsadüfi deyil ki, bir sıra özəl ticarət şəbəkələrində 3 litrlik şüşə balonlarda 30-40 manata ləziz bir məhsul kimi satılan konservləşdirilmiş çəşirə biz bütün il boyu rast gəlirik və qidalanma üçün onu alırıq.

Amma təəssüf ki, çəşirin konservləşdirilməsi üçün elmi cəhətdən əsaslandırılmış konkret reseptura və texnologiyaya yazılı mənbələrdə bu günə qədər rast gəlmək mümkün deyildir. Hazırda evlərdə çəşiri kim necə istəyir o vəziyyətdə konservləşdirir deyə, hazır məhsul heç də hamı tərəfindən müsbət qəbul edilmir.

Bu ilk növbədə çəşirin yarpaq və saplaqlarının xoşagəlməz acı (zəhərli) dadı iyi ilə izah olunur, onun tərkibinin texnoloji emal zamanı dəyişilməsinin tam əsaslandırılmaması ilə əlaqədardır. Təzə yetişmiş çəşirdə hüceyrə quruluşunun formalaşmasını təmin edən protopektin kompleksi elə vəziyyətdədir ki, çox zaman onu suda qaynadan kimi quruluşu dağılır, ya da vaxtsız yığılıb işlədəndə, bişmə zamanı rezin kimi çeynənməyən xoşagəlməz quruluşa malik olur. Bundan başqa, onun acılığının götürülməsi və rənginin yaxşı saxlanmasının təminatı da aktual məsələlərdəndir.

Yeni texnologiya məhz bu məsələnin həllini nəzərdə tutmaqla, əhaliyə yüksək keyfiyyətli konservləşdirilmiş çəşir çatdırılmasını təmin etməlidir. Fikrimizcə, konservləşdirilmiş çəşir ixrac yönümlü məhsul kimi də diqqət çəkə bilər.

Laboratoriya şəraitində apardığımız tədqiqatlar göstərir ki tutqun yaşıl yarpaqlara və saplağa malik olan çəşir, açıq rənglilərə nisbətən keyfiyyətli sayılır və onun acılığının çıxarılması üçün əlverişli hesab olunur. Bişirəndə o incə və şirəli alınır, bir az çox bişirildikdə isə tərkibindəki pektinlərin zənginliyindən zəif jele quruluşunu xatırladır.

Adətən ilin aprel-may aylarında yığılmış çəşirdə sellüloza 1,45%, zülali maddələr 1,85%, mineral maddələr (külün miqdarı)-1,3%, monoşəkərlər və saxaroza 3,3%, üzvi turşular (alma turşusuna görə) – 0,1 % C vitamini 80-100 mq %-ə qədər təşkil edir. Onun tərkibində nişasta demək olar ki, yoxdur. Ən yaxşısı çəşiri aprelin ortalarına qədər yığıb toplamaqdır. Bu zaman həm də çəşir saplağında tünd ətirli-ədviiyyə dadlı birləşmələr üstünlük təşkil edir. Bişirən zaman nümunələr şirəli və yumşaq , ətirli olur.

Mineral tərkibin öyrənilməsi üzrə kompüter materiallarının təhlili onu göstərmişdir ki, çəşir saplağında 14-dən çox makro- və mikroelementlər toplanmışdır. Bunların içərisində kalium, kalsium, dəmir, mis, xrom, kobalt, elementləri üstünlük təşkil edir və hətta qızıl ionlarının mövcudluğu da müşahidə edilmişdir. Bu da fikrimizcə bitkinin yığılma yerində torpağın zəngin mineral ehtiyata malik olduğu ilə əlaqədardır. Bütün bunlar çəşir saplağının müalicə profilaktik əhəmiyyətini bir daha təsdiqləyir və onun qida texnologiyaları üçün vacibliyinə dəlalət edir.

Təzə çəşir 7-10 dəqiqə ərzində pörtlədildikdən sonra istifadə olunmalıdır. Bununla belə, acılığın çox olmasından başqa onun qüsuru cavan çəşirin bişirmə (pörtlətmə) zamanı- tamam ötdükdə əzilmiş (saxlanma üçün yararsız) quruluşa düşməsidir. Bunun qarşısının alınması üçün,şəkil 2-dən görüldüyü kimi fikrimizcə çəşiri pörtlədilmədən əvvəl 70-80°C- də isti suda 15-20 dəqiqə ərzində islatmaq lazımdır. Bu zaman çəşirdə olan PME -pektinmetilesteraza fermentinin aktiv təsiri ilə yumşalmanı təmin edən həll olan pektinlərin tədricən həll olmayan vəziyyətə düşməsinə və onun bişmə zamanı incə quruluş almasını təmin edir. Bunlar tərəfimizdən təsdiqlənmiş və bütün tərəvəzlər üçün də elmi cəhətdən əsaslandırılmış olan məlumatlardır. Ən maraqlısı isə çəşir saplağının yüksək mineral tərkibə malik olmasının müasir rentgenoflüoressensiya analizi ilə təsdiqlənmişdir. 2-ci şəkildəki sxemdən bu aydın görünür.

İş üzrə ümumi nəticələr

1. Yabanı halda yetişən çəşir cinsinin növləri haqqında ədəbiyyat məlumatları təhlil olunmuş, onların müalicəvi qida əhəmiyyəti, fitokimyəvi və farmakoloji xüsusiyyətləri ümumiləşdirilmişdir .

2. Laboratoriya şəraitində çəşirin saplığında müasir rentgenflüoressensiya üsulu ilə zəngin mineral tərkibin mövcudluğu təsdiq edilmişdir.

3. Temperaturdan asılı olaraq çəşir saplığında PME fermenti aktivliyinin dəyişməsi öyrənilmişdir ki, bu da yeni texnologiyalar yaradılmasında, xüsusilə onun konservləşdirilməsi üçün əsas şərtlərdən hesab olunur. Hazırda alınan elmi məlumatlar əsasında texnologiyada tətbiq olunacaq ixtira materiallarının hazırlanması nəzərdə tutulur.

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Sociological Sciences

Professional skills needs' assessment in tourism and hospitality sector

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Abstract

This research assesses the professional skills needs in Georgia's tourism and hospitality sector post-COVID-19. It aims to identify required professions and qualifications, improve existing education programs, and suggest new ones. The study analyzes employer surveys and finds a steady recovery in the private tourism sector, but a shortage of qualified personnel in various regions is hindering growth. Employers tend to recruit personnel without involving educational institutions. In-demand professions are identified, and three essential lacking skills are highlighted: languages, problem-solving, and independence. Key competencies required include communication, customer service, and work attitudes. Employers attribute the skills gap to inadequate vocational training and teacher quality. Recommendations include emphasizing practical training, updating programs to market demands, and aligning them with international standards. Unpopular professions require awareness-raising efforts. Strengthening cooperation between educational institutions and the private sector is essential, fostering internships, employment, and program development. The research reveals that educational institutions rarely consult with employers to develop relevant programs. However, 77% of employers express readiness to partner with vocational educational institutions in a dual approach to enhance professional education. Overall, this research contributes valuable insights to facilitate sustainable growth and address skill gaps in Georgia's tourism and hospitality industry. By aligning education with market demands and fostering closer cooperation between the private sector and educational institutions, the industry can better equip its workforce, meet employer needs, and drive the country's tourism and hospitality sector towards greater success and resilience in the post-pandemic era.

Key Words: Tourism, Hospitality, Skills, Professional education.

JEL Classification: Z31 Industry Studies; Z32 Tourism and Development.

Reference: N. Kekelidze, N. Kvachantiradze. (2023). Professional skills needs' assessment in tourism and hospitality sector.

1. Introduction

Carry out of research the needs for tourism and hospitability sector professional skills and development of recommendations was conducted within the project existing between Georgian Tourism Association and Germany International Cooperation Association GIZ - „Support of Technical and Professional Education and Training Development in the Tourism Sector”. The aim of the project was coordination and support of the professional education and trainings by

direction of tourism and hospitality, which increased and enhanced the tourism industry of Georgia.

The research is conducted by Nino Kekelidze Head of Educational Tourism Committee at GTA and Natalie Kvachantiradze Chairman of Georgian Tourism Association.

Purposes of the Research

The purpose of the research is to investigate and assess the existing required professions and qualifications in the tourism and hospitality sector of Georgia after COVID-19 pandemic. To determine the required qualification skills and development of the recommendations for labor market of Georgia about existing professional education programs improvement or to develop of new programs.

Tasks of the Research

In the sector of tourism and hospitality of Georgia:

- Assessment of the market needs;
- Identifying the needs of employers in the direction of professional and general competencies of human resources (knowledge and skills);
- Highlighting the need for mutual cooperation between employers and vocational schools.

Methodology

Based on the purposes and objectives of the research, quantitative and qualitative research methods were used, where the sequence of activities to be performed was established by structures:

- ✓ Preliminary research/identification of existing professional educational programs and market of employers in the direction of tourism and hospitality
 - Highlight of the existing dual professional educational programs in the direction of tourism and hospitality
 - Identifying the market of employers in the direction of tourism and hospitality
- ✓ Survey of employers through an electronic questionnaire
- Development of the research questionnaire
- Survey of employers through an electronic questionnaire
- Identifying the findings from the survey of employers and analyzing the results
- ✓ Organizing the focus - group
 - Organizing a focus group with employers participating in the research
 - Presentation, validation and analysis of research results
 - Development of final recommendations

During the initial stage of the research, the Georgian Tourism Association conducted a survey of existing dual professional educational programs in the field of tourism and hospitality, where the following four programs were identified:

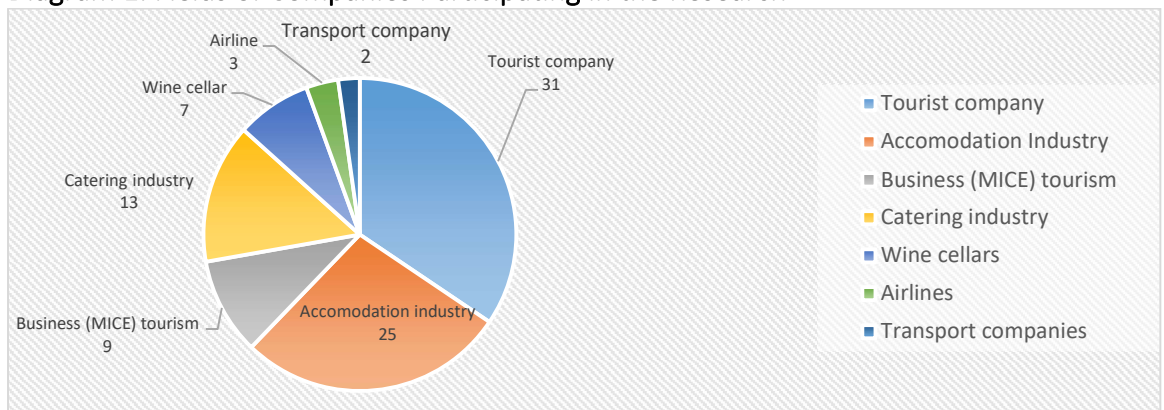
- Art of cooking
- Confectionery
- Hotel services
- Restaurant services

The four existing programs were compared with the specifics of the employers' market of the same industry and the need was identified to include in the research not only employers in the direction of the above-mentioned four programs (accommodation and food sector), but also all member companies of the Georgian Tourism Association in order to achieve the goals of the research as efficiently as possible. In the result, the predetermined number of Georgian Tourism Association (150 companies) and up to 10 medium and large companies operating in the field were selected: Hotels, catering facilities, domestic, inbound and outbound travel companies, wine cellars, transport and business (MICE) tourism companies, airlines.

During the second stage of the research, a research questionnaire was developed (Find attached Appendix 1.), which included questions regarding the skills needed in the field, as well as the involvement of companies in vocational training and the existing and possible forms of their cooperation with the vocational schools. There were selected occupations and skills/competencies in the questionnaire that are compliant with the international education standards and, at the same time, in line with local labor market requirements.

The developed questionnaire was sent to 160 companies, of which 66 companies (41%) filled out the questionnaire. From the surveyed companies, 31 were tourism companies, 9 business (MICE) tourism, 25 accommodation industry, 13 catering industry, 7 wine cellars, 3 airlines, 2 transport companies (Find diagram 1.). It is important to note that due to the specifics of the tourism industry, there were several cases from the surveyed companies, when each company was represented equally in different areas of tourism, for example: one company is represented as a hotel, a catering facility and a wine cellar. From 66 companies surveyed, a wide range of different areas of tourism were covered.

Diagram 1. Fields of Companies Participating in the Research



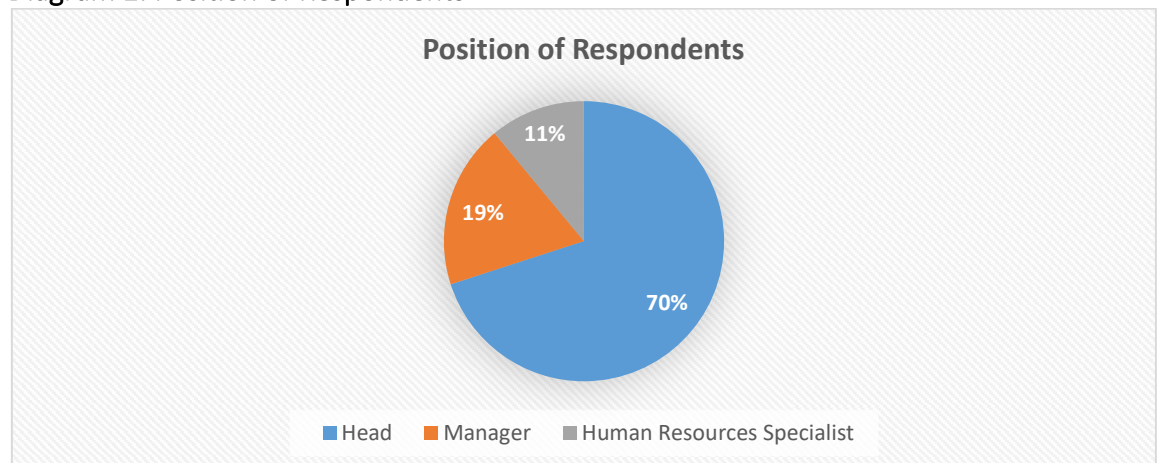
During the end of the second stage of the research, the findings from the employer survey were compared and identified, and the results were analyzed.

During the third stage of the research, a focus group meeting was planned with the participating employers, to whom the results were presented, a summary analysis was performed, the results were validated and final recommendations were developed (Find attached Appendix 2, Appendix 3, Appendix 4).

Respondents Participating in the Research

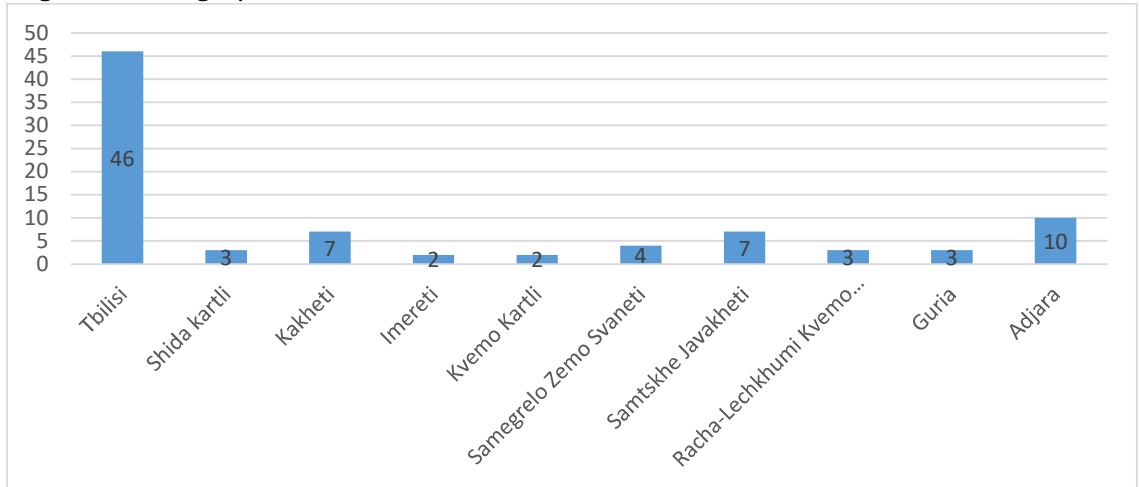
From 66 companies participating in the research, the questionnaire was mostly filled by top managers: head/founder - 70%, manager - 19%, human resources specialist - 9% (Find diagram 2.).

Diagram 2. Position of Respondents



Geographical area of participating respondents: Tbilisi - 46 companies, Kakheti - 7, Imereti - 2, Kvemo Kartli - 2, Samegrelo Zemo-Svaneti - 4, Samtskhe-Javakheti - 7, Shida Kartli - 3, Racha-Lechkhumi, Kvemo Svaneti - 3, Guria - 3, Adjara - 10. (Find diagram 3.).

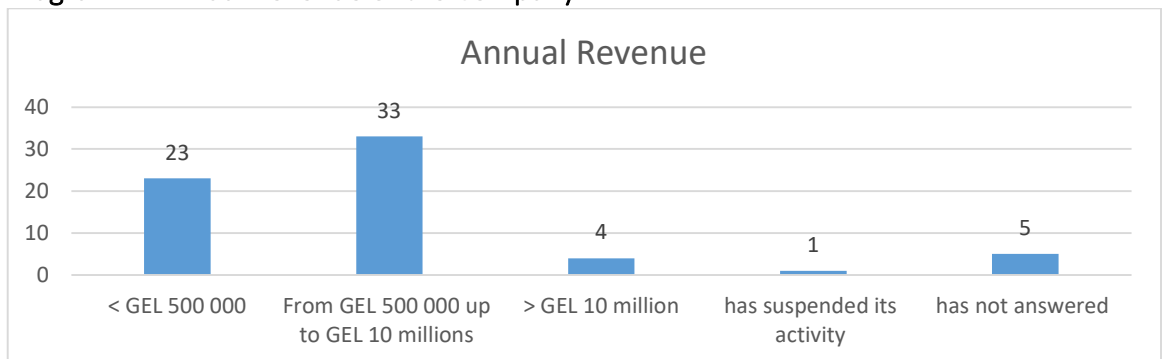
Diagram 3. Geographical Area of Research



The participating surveyed 66 companies significantly define the labor market of the Georgian tourism and hospitality industry, as evidenced by their annual revenues and financial turnover. Following the COVID-19 pandemic, the annual revenue of the surveyed companies is as follows (Find Diagram 4.):

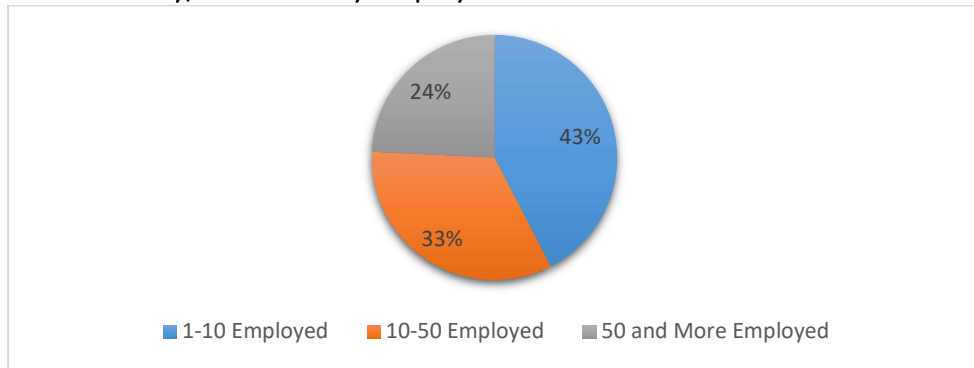
- < GEL 500 000 – 23 Companies
- From GEL 500 000 up to GEL 10 million - 33 companies
- > GEL 10 million - 4 Companies
- 1 has suspended the activity
- 5 has refused to publish of the mentioned information

Diagram 4. Annual Revenue of the Company



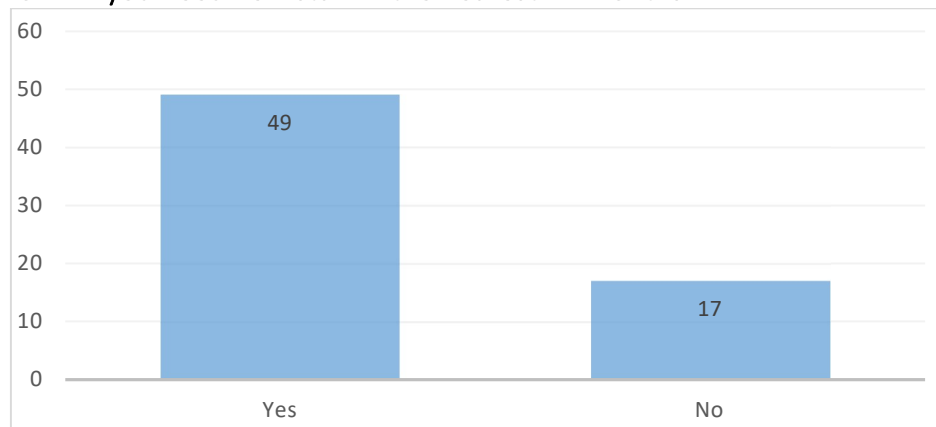
The number of employees of the respondent companies is different in all the participating companies due to the specificity and diversity of the tourism and hospitality industry and at the same time the damage caused by the COVID-19 pandemic. From 66 participants, 28 companies have employed from 1 to 10 persons. 22 companies have from 10 to 50 employees, and 16 companies have 50 or more employees (Find diagram 5.).

Diagram 5. Currently, Permanently Employees Number



In order to achieve the main objectives of the research, it was important to specify the expectations of the companies regarding the increase/decrease the number of employees after 12 months, where 49 participants from 66 respondents explained that they will need a new staff in the next 12 months; Meanwhile, 17 participating companies explain that they will not need new personnel.

Diagram 6. Will you need new staff in the nearest 12 months?



1. Research Analysis

The questionnaire of employers consisted of 24 questions (Find Appendix 1.), which were directed to the main objectives of the research and related to post-Covid-19, to determine the qualification professional and general competencies (knowledge and skills) needed for the labor market in the tourism and hospitality sector of Georgia and to develop recommendations for the purpose of improving the existing professional educational programs or developing new ones. For the maximum fulfillment of the above-mentioned goals, three important tasks were identified, which were formulated in the form of different questions in the research questionnaire:

- Assessment of market needs;
- Identifying the needs of employers in the direction of professional and general competencies of human resources (knowledge and skills);
- Highlighting the need for mutual cooperation between employers and vocational schools.

Whereas one of the important criteria for the assessment of the program for the institutions implementing the dual professional educational program is the targeted and long-term employment of the graduates, at the initial stage of the research, it was required to determine the internal procedure of the employers: how and using what methods they employ new staff in their companies. Based on the analysis of the research results, it was determined that the employers, when hiring a new staff, mostly try to implement personnel changes themselves and are less address to professional or higher education institutions. 69.7% of respondents publish

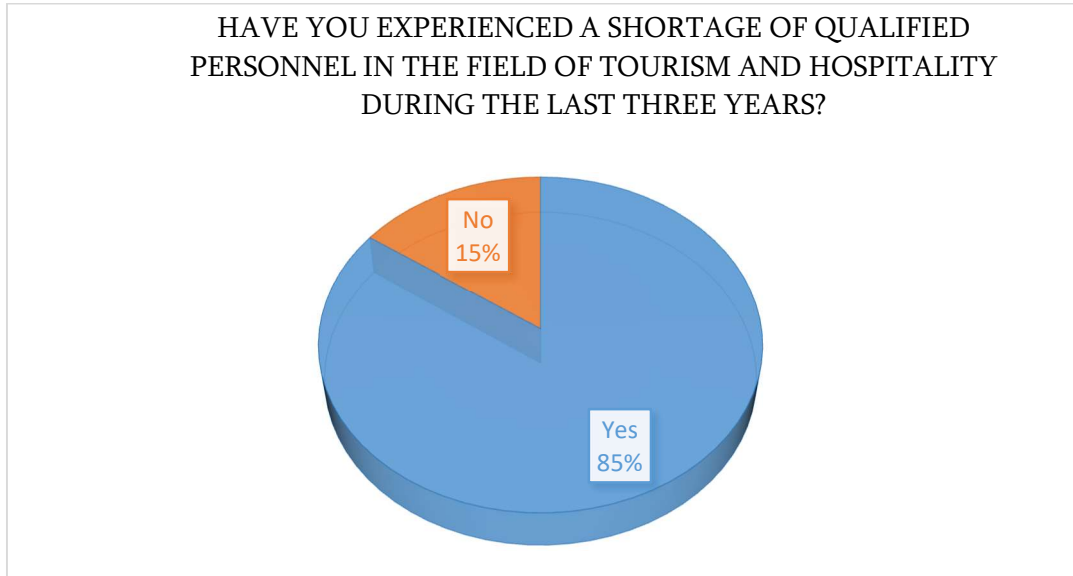
vacancies: on jobs.ge/hr.ge/worknet.ge, 63.6% address colleagues, 51.5% use Facebook groups, 31.8% use LinkedIn and 24.2% use other following employing know-hows: Raising staff by own efforts, promoting internal staff and other similar things. 30.3% of participating respondents address professional educational colleges, 27.3% address higher educational institutions, and 13.6% are in contact with the Georgian Tourism Association regarding the issue of new personnel needed (Find diagram 7.).

Diagram 7. How do you hire staff at your company?



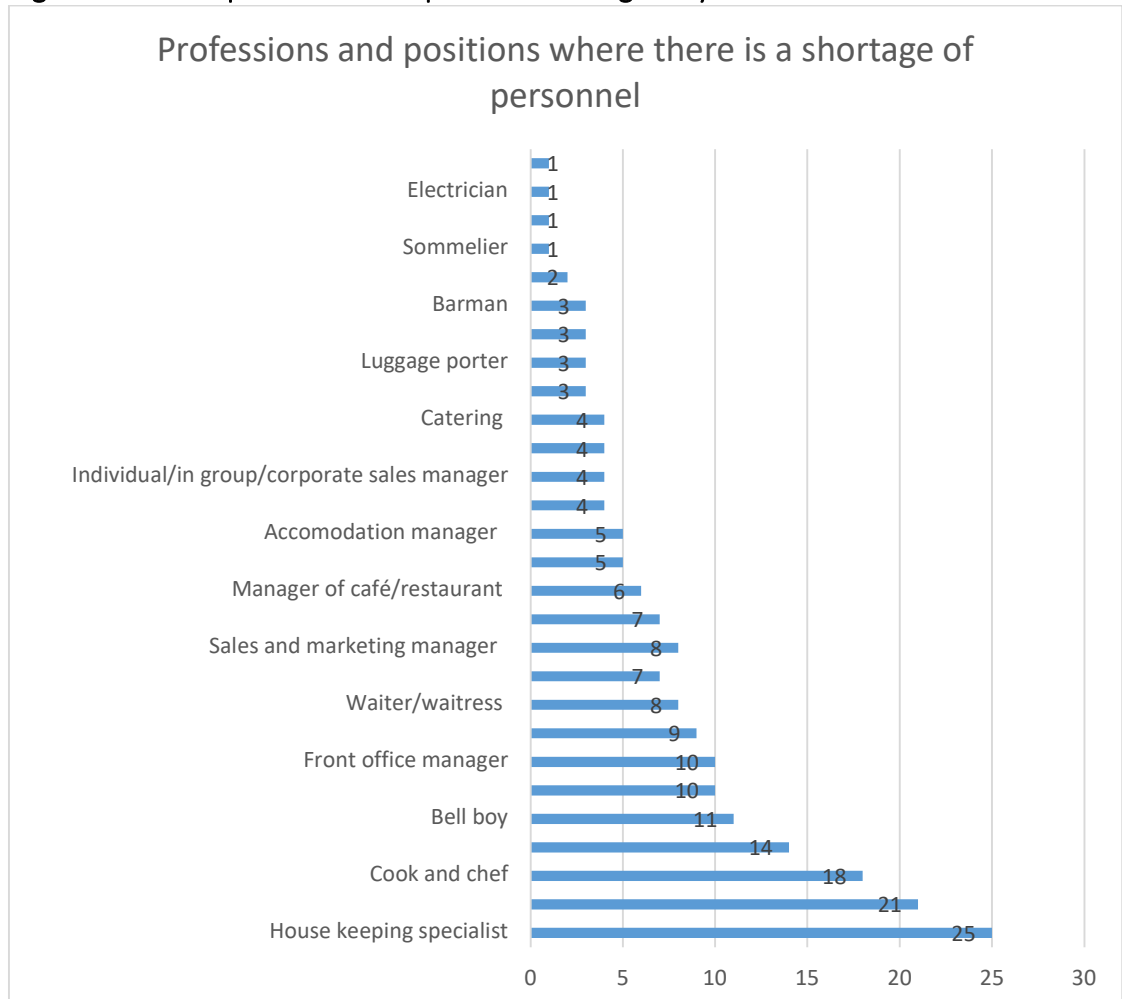
Based on the analysis of the surveyed respondents results , it was determined that the tourism and hospitality industry has been experiencing a shortage of qualified personnel for the last three years, which is confirmed by 85% of the respondents (Find Diagram 8.).

Diagram 8. Shortage of Skilled and Qualified Staff



Professions and positions that are mainly in demand by the private sector, where is seemed a lack of qualified personnel, are presented in the attached diagram (Find diagram 9.) According to 45.5% of respondents, the private sector is experienced a shortage of personnel in the position of housekeeping specialist. After the position of housekeeping specialist, according to 38.2% of the respondents, the most in-demand profession is tour operator (air tickets, local, import and/or export). According to 38.9% of respondents, there is a shortage of staff for the professions of cooks and chefs. 25.5% are experienced a lack of staff in the position of tourist guide. Demand for the position of bell boy was also observed with a view of 20%. 18.2% need a confectioner and a front office manager, 16.4% think that there is a shortage of staff for customer relations manager positions.

Diagram 9. Which profession and position shortage do you have?



26% of respondents think that they will not need new staff in the next 12 months, and 74% think that they will need to hire new staff, according to the following professions:

- ✓ Housekeeping specialist
- ✓ Housekeeping division manager
- ✓ Cook assistant
- ✓ Cook
- ✓ Administrator
- ✓ Waiter/waitress
- ✓ Safety officer
- ✓ Driver by own car
- ✓ Tour operator
- ✓ Guide
- ✓ Operational manager (reservations)
- ✓ Barman
- ✓ Sales manager
- ✓ Social media manager

The companies participating in the research note that the positions of housekeeping specialist, waiter/waitress, administrator and cook are lacked mostly. It is noted that even in the process of filling out the questionnaire, several companies have vacant positions of 20 housekeeping specialists and 20 waiters. One company also announces its readiness to hire 10 drivers by own vehicle.

In relation to the deficiencies in the skills of the employed staff, three main skills were identified that are lacking in the staff:

1. **Language ability**
2. **Ability to solve problems**
3. **Work independently**

According to the relatively low percentages, the skills where the employed personnel suffer from weaknesses were also highlighted: Self-motivation and self-control, punctuality, stress and time management, empathy and emotional intelligence, strategic thinking and innovativeness.

Diagram 12. What skills do tourism and hospitality workers lack the most?



The following competencies were named as the three most important professional competencies (knowledge and skills) that personnel should have:

1. Written and spoken communication in Georgian language and one international language (business correspondence, ability to write reports) – 36 respondents;
2. Customer service skills (customer service skills in different types of tourist institutions) - 33 respondents;
3. Work competencies: basic competencies, such as attitude to work and personal assumptions - 31 respondents.

In addition to the above, the need for the following professional competencies was additionally identified: planning, quality control, sales and etc.

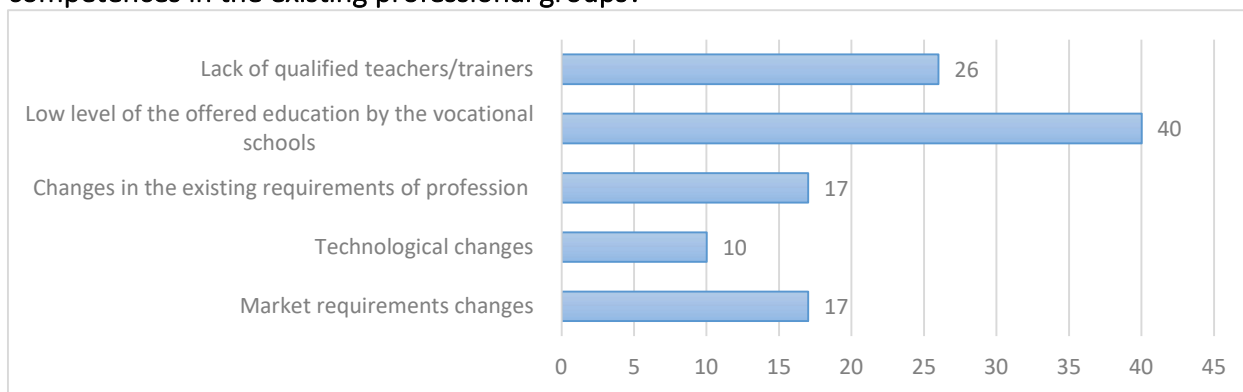
As a result of highlighting the deficiencies of staff skills, it was important to determine what caused the lack of skills and professional competencies of the employed staff. According to the opinions of 40 companies from 66 respondents, this is caused by the low level of training offered by vocational schools. 26 participants think that it is the lack of qualified teachers, trainers and instructors that causes the lack of skills and professional competences in the country (Find diagram 14). Different opinions were also reported on behalf of the individual respondents:

- „Student have lack of personal development motivation”.
- “The staff do not want to develop, because they work without it, and it seems that many people are satisfied with the quality of their work." For example, still too many organizations

do not know how to issue an invoice and say that it has been working this way for years and no one has needed an invoice from them except us."

- "There is no need to get professional education, therefore the majority of the employees do not try to get professional education".
- "For most of the employees, the work is of a temporary nature, therefore most of them do not devote the appropriate time and attention to raising their qualifications. This also applies to managerial positions."
- "A cook cannot think of himself as a chef because he/she only studied at the academy."
- "I don't know what disciplines they are passing, but I can see that they are not ready for work."
- "They haven't developed the basic skills of reporting." They always demand to avoid answers to the outputs, but they themselves do not give the so-called feedbacks".
- "Physically, there are no staff who have the desire to be employed, otherwise we will conduct the training in the hotel as well."
- "Outflow of young people abroad".
- "Wrong professional orientation".
- "Disinterested approach to work".

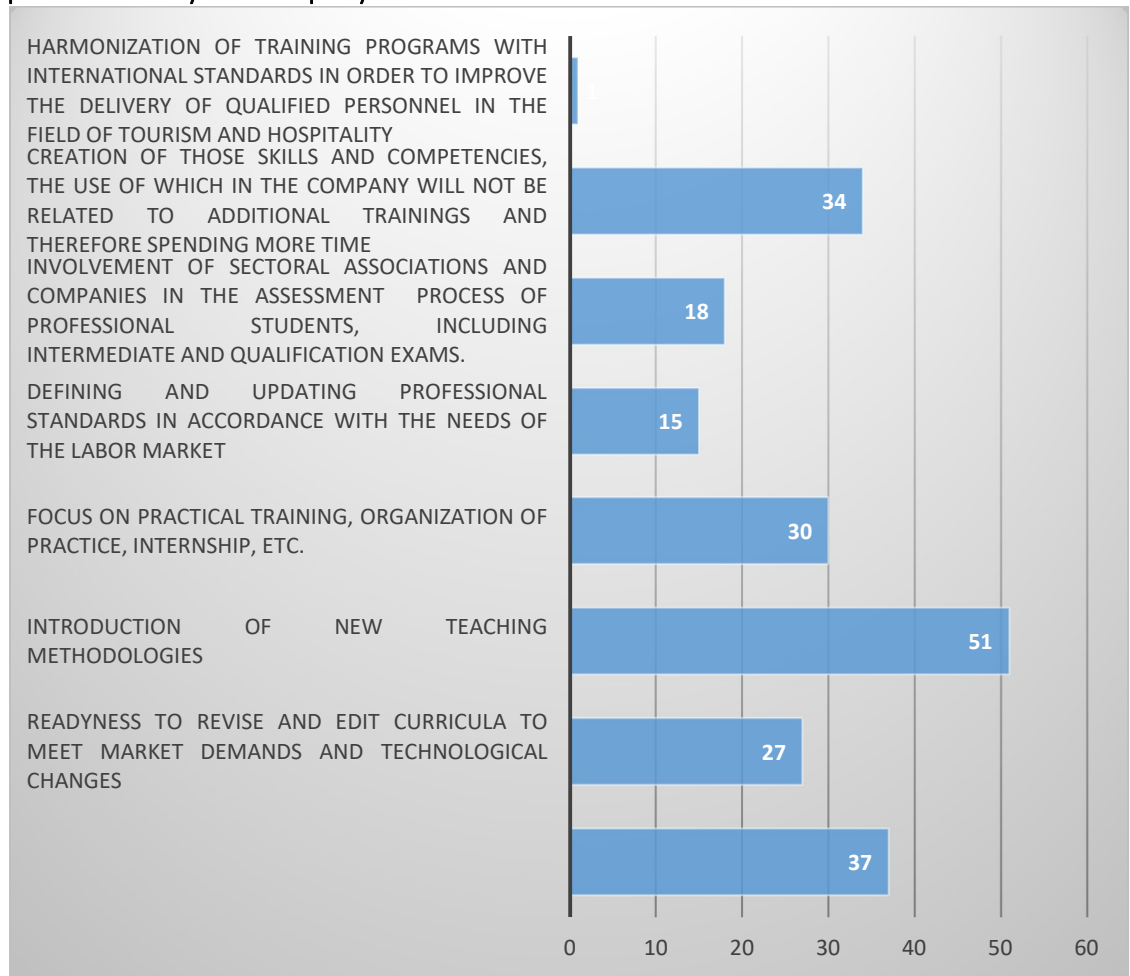
Diagram 13. In your opinion, what is the reason of lack the skills and professional competences in the existing professional groups?



According to the opinions of 51 respondents surveyed, staff turnover in the professional groups of the tourism and hospitality industry is due to the socio-economic background of the country, 25 respondents think that it is due to the wrong professional orientation, while one respondent expressing the following opinion: "The shortage of staff is particularly noticeable in the regions. As you know, the flow of competent staff is actively taking place from the regions to the capital, or in the most cases, the outflow is taking place outside the country. The remained part is not professionally trained and any work for them is temporary."

51 of the surveyed respondents think that the focus of school on practical training and the organization of practice and internships will significantly help the graduate learn the mandatory skills that the employer actually needs. 37 participants, regarding the necessary changes, think that it is important to revise and edit the training programs in order to bring them into line with market demands and technological changes (Find diagram 15).

Diagram 14. In your opinion, what changes are required in the vocational and higher educational institutions of tourism and hospitality, in order to satisfy the skills of graduates the work requirements of your company?

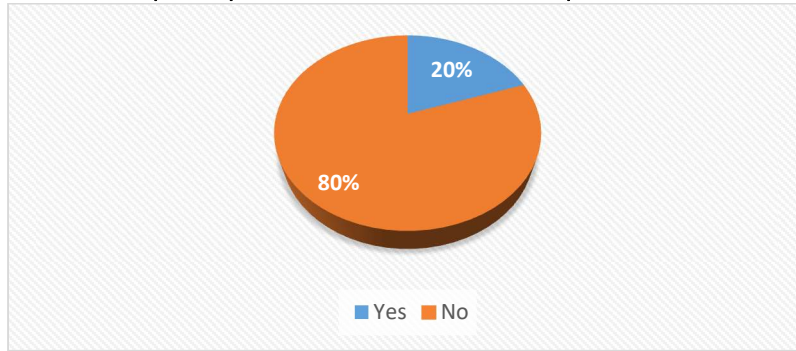


80% of the participants declare, that none of the educational institutions consulted them in order to develop new training programs (Find diagram 16.), but 20% of the surveyed companies name the following educational institutions with which they consulted, namely:

- ✓ Vocational college Blex
- ✓ Aviation university
- ✓ Caucasus international university

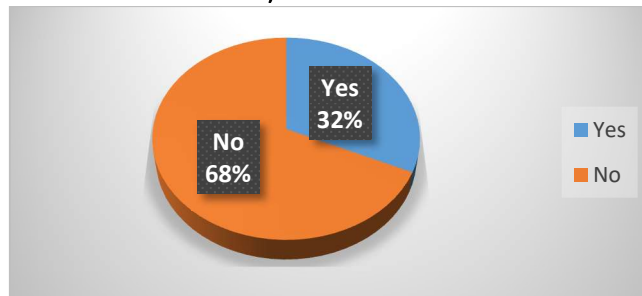
“One of the respondents mentioned that he cooperates with many educational institutions in the region. For example: Telavi Vocational Education College and BDC Academy Telavi. According to the explanation of the second respondent, "this issue is more difficult in the region, because there are no vocational schools, and bringing them from Tbilisi is associated with a significant increase in costs."

Diagram 15. Have any of the educational institutions had any consultations you're your company in the tourism and hospitality sector in order to develop new curricula?



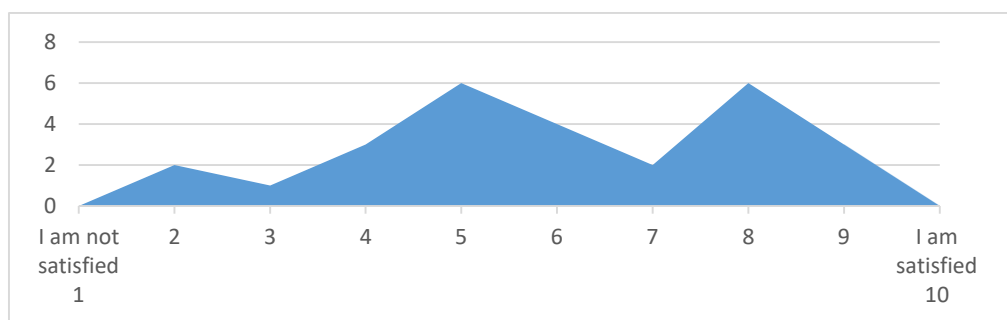
68% of the surveyed respondents declare that they do not cooperate with professional educational institutions, in terms of employment of graduates, sharing of work experience, granting of scholarships, allocation of practice places or other directions (Find diagram 17.)

Diagram 16. Does your company cooperate with the professional educational institutions (in terms of employment of graduates, sharing of work experience, granting of scholarships, allocation of practice places or other directions)?



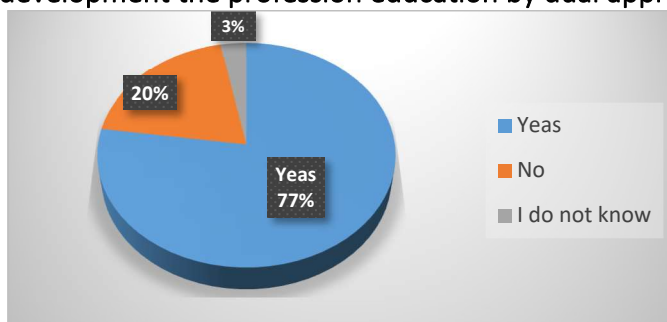
32% of the surveyed participants, who noted that they cooperate with professional educational institutions, additionally was determined the satisfaction index of their mutual cooperation, specifically according to the skills and competencies of the graduates, where the average satisfaction index was revealed (Find diagram 18.)

Diagram 17. If your answer on the previous question is positive, please specify are you satisfied by skills and competences of graduates the professional educational institutions?



13 respondents participating in the research refused to cooperate with educational institutions. 51 respondents express their readiness to cooperate. 2 participants have no answer to the mentioned question (Find diagram 19.).

Diagram 18. Do you want to become a partner of a profession educational institution by direction of introduction-development the profession education by dual approach?



77% of respondents participating in the survey, who declared that they are ready to cooperate with educational institutions, highlighted the following main areas of cooperation:

1. Participation in the implementation of the practical component of the program - 34 (66.7%)
2. Employment of graduates/students - 29 (56.9%)
3. Participation in short-term trainings - 20 (39.2%)
4. Involvement in the training process as a partner company - 18 (35.3%)
5. Sharing experience, participation in program development, including curriculum development - 16 (31.4%)

In addition, directions of cooperation were identified according to priority:

6. Partnership in dual educational programs - 10 (19.6%)
7. As a partner company, allocation of instructors for professional training - 6 (15%)
8. Providing instructors/teachers without becoming a partner company - 5 (9.8%)
9. Sponsorship / scholarship - 0 (0 %)

2. Main Findings of the Research

Based on the analysis of the employers' survey, the current situation and needs in the tourism and hospitality sector were determined, in accordance of which the main findings were identified, the consideration and improvement of which will allow the sector to develop rapidly and sustainably.

As a result of the research analysis, the main findings are highlighted:

- After the crisis caused by COVID-19, the recovery processes in the private sector of tourism are taking place steadily, and the most companies in the sector continue to operate successfully in the market.
- The sector has a shortage of qualified personnel both in the capital city Tbilisi and in the regions: Kakheti, Samtskhe-Javakheti, Mtskheta-Mtianeti and others. This has a negative impact on the functioning of the private sector, on the sustainable development of the country's economy as well;
- In the sector, there is a massive flow of the existing professional staff from the country, one of the determining factors of which is the socio-economic background of the country. The above mentioned needs effective steps for the survival and better development of the industry.
- In case of need for new personnel, the majority of employers do not contact vocational or higher education institutions and use their own resources to recruit new personnel, for example: They publish information about vacant positions via online employment websites and social networks, communicate with colleagues, increase staff with their own resources, etc.;
- In-demand professions and positions (housekeeping specialist, tour operator, cook/chef, tour guide, etc.) have been confirmed, some are covered by dual professional programs, but the profession of tour operator and guide, which is not included in the dual professional education, was again highlighted among the professions in demand by employers.

- In relation to the deficiencies in the skills of the employed staff, three main skills were identified that are lacking in the staff:

1. Ability of languages;
2. Ability to solve problems;
3. Work independently.

- The following competencies were named as the three most important professional competencies (knowledge and skills) that personnel should have:

1. written and spoken communication in Georgian language and one international language (business correspondence, ability to write reports);
2. Customer service skills (customer service skills in different types of tourist institutions);
3. Work competencies: Basic competencies such as attitudes to work and personal assumptions.

- According to the opinion of employers, the lack of skills and professional competences of the employed personnel is caused by the low level of training offered by vocational educational institutions and the lack of qualified teachers/trainers.

- In order for the skills of the graduates to meet the job requirements of the private sector, three main changes to be implemented have been identified:

1. Focus on practical training, organization of practice, internship;
2. Readiness to review and change training programs in order to bring them in line with market demands and technological changes;
3. Harmonization of training programs with international standards, in the purpose to improve providing of qualified personnel in the field of tourism and hospitality.

- Certain professions and positions in the field of tourism and hospitality, such as housekeeping specialist, waiter, steward, luggage porter and others are unpopular with both employees and their family members, which requires awareness raising and more popularization of the professions.

- It was observed the lack by the direction of professional orientation, when after the end of practice, the graduates justify the refusal of an "unpopular" vacant position for them with an uninterested attitude towards the field or a specific position.

- 80% of the participants declare that no educational institution has consulted with them in order to develop new training programs.

- 77% of the respondents express their readiness to become a partner of a vocational educational institution with a dual approach in terms of introduction and development of professional education.

- The private sector representatives express their readiness to cooperate with professional colleges in the following directions:

1. Participation in internship programs;
2. Employment of graduates/students;
3. Participation in short-term trainings;
4. Involvement in the training process as a partner company;
5. Sharing experience, participation in program development, including participation in curriculum development.

Recommendations

1. Strengthening of close and active mutual cooperation between educational and private sectors of tourism and hospitality industry, in the part of training of professional personnel, development of new professional programs, employment of graduates.
2. Raising awareness about dual professional education;
3. Strengthening the professional orientation direction so that the student enrolled in the dual professional program clearly understands the strengths and weaknesses, opportunities and threats of his/her future profession, as well as feels the interest and love of the field. A student enrolled in a dual professional program should make an independent decision when choosing a profession and not act under the influence of an opinion parent or other person;
4. Review of the existing programs in the tourism and hospitality sector by practicing teachers and field experts;
5. Taking into account the needs of the market in terms of strengthening the general and professional competencies (knowledge and skills) of professional staff;
6. Appearing of new training offers for in-demand professions, such as tour operator and guide;
7. Training of teachers of vocational institutions and instructors of companies;
8. Continuous monitoring of cooperation between the private sector of tourism and hospitality and professional colleges, analysis of existing challenges and achieved results.
9. In case of recruitment, the employer selects qualified personnel who have a diploma confirming the relevant qualification or is certified.

Conclusion

In conclusion, this research focused on assessing the professional skills needs in Georgia's tourism and hospitality sector following the COVID-19 pandemic. The main results of the study revealed several key findings that have implications for the sector's growth and development.

Firstly, the private tourism sector in Georgia is steadily recovering after the pandemic, but it faces a significant shortage of qualified personnel in various regions, negatively impacting its operations and the country's economy.

Secondly, employers tend to recruit new personnel without involving vocational or higher education institutions, indicating a lack of collaboration between the private sector and educational institutions.

Thirdly, the study identified specific in-demand professions, such as housekeeping specialists, tour operators, and cooks/chefs, but some crucial positions like tour operators and guides are not covered by dual professional education, warranting attention and potential program development.

The research also highlighted three essential skills lacking in the workforce: language abilities, problem-solving skills, and the ability to work independently. Additionally, employers emphasized the importance of specific professional competencies, including communication skills, customer service skills, and work attitudes.

Furthermore, the skills gap in the workforce was attributed to the low level of training offered by vocational educational institutions and a shortage of qualified teachers/trainers.

The research concludes by providing practical recommendations to address these issues. It suggests focusing on practical training, updating programs to meet market demands, and aligning them with international standards. Efforts to raise awareness about unpopular professions and strengthening cooperation between educational institutions and the private sector are essential for addressing skill gaps and fostering industry growth.

Overall, the research contributes valuable insights to guide policymakers, educational institutions, and employers in enhancing the professional skills and qualifications of the workforce in Georgia's tourism and hospitality sector. By implementing these recommendations, the industry can overcome challenges, ensure a skilled workforce, and promote sustainable development in the post-pandemic landscape.

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After her education diploma as an art expert Academy and her Bachelor's degree at the Georgian Technical University, Natalie Kvachantiradze founded the travel and real estate company Harmony Ltd. in 2005. As a co-founder and full member of the Georgian Tourism Association (GTA) and its chairperson since 2006, Natalie Kvachantiradze has many years of professional experience at the highest level in the Georgian tourism and hospitality sector.

She has a keen interest in the development of service quality in tourism, which is why she has been working at the National Centre for the Enhancement of Education Quality (NCEQE) since 2019, where she has served as an expert on higher education accreditation, as a member of the Accreditation Council for Vocational Training Institutions and as Chair of the Personal Services Council.

These positions helped her to develop the quality of tourism services in Georgia by pioneering the creation of new quality standards in the tourism sector.

Since 2014, she has been the Chair of the Technical Committee for Tourism of the Georgian National Agency for Standards and Metrology (GeoSTM), which is under the Ministry of Economy.

Due to her extensive knowledge, excellent network and expertise in the tourism sector, she became a member of the jury of the International Hospitality Awards (Ukraine), a member of the Tourism Advisory Board of the Ministry of Economy, a member of the Advisory Board for the Promotion of Private Sector Development (Ministry of Economy) and a member of the Vocational Training Council of the Georgian Parliament.

Philological Sciences

Fransız dilində vasitəsiz və vasitəli nitqin işlənmə yolları

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Açar sözlər: *vasitəli nitq, vasitəsiz nitq, budaq cümlə, indiki zaman, ümumi sual cümləsi, xüsusi sual cümləsi*

Xülasə

Vasitəsiz nitq danışanın fikrinin olduğu kimi verilməsidir. Danışanın fikri dırnaq (" ") işarəsi arasında verilir.

Sabir dit: "Je viens de l'école".-Sabir deyir: "Mən məktəbdən gəlirəm."

Leyla demande: "Que fais-tu?"-Leyla soruşur: "Sən nə edirsən?"

Maman dit: "Va vite dans ta chambre!"- Ana deyir: "Tez otağına get!"

Vasitəli nitq danışanın fikrinin müəllif tərəfindən dəyişdirilməsidir. Vasitəli nitqdə başqasının sözləri olduğu kimi yox, yəni dəyişdirilmiş şəkildə verilir. Bu zaman müəllifin sözlərindən sonra qoşa nöqtə və dırnaq işarəsi atılır, daha sonra isə müəllifin sözlərinin ardınca "que" bağlayıcısı istifadə olunur.

Sabir dit qu'il vient de l'école.- Sabir deyir ki, o məktəbdən gəlir.

Leyla demande ce que je fais.- Leyla mənim nə etdiyimi soruşur.

Maman lui demande d'aller vite dans sa chambre.- Ana ona tez otağına getməyi əmr edir.

Vasitəsiz nitqi vasitəli nitqə çevirərkən aşağıdakıları bilmək lazımdır:

Vasitəsiz nitqin əvvəlində gələn cümlə baş cümlə adlanır, danışanın ifadəsi isə budaq cümləyə çevrilir. Vasitəsiz nitq vasitəli nitqə çevrilərkən budaq cümlədə işlənen əvəzlilər baş cümləyə uyğun olaraq dəyişir.

1.Nəqli cümlənin çevrilməsi

a) Bu vaxt danışanın ifadəsi baş cümləyə "que" bağlayıcısı vasitəsi ilə bağlanır və Azərbaycan dilinə tamamlıq budaq cümləsi kimi tərcümə olunur.

b) Budaq cümlədəki əvəzlilər baş cümləyə mübtədasına uyğun olaraq dəyişir.

c) Zaman uzlaşması mütləqdir. Əgər baş cümlə "Présent de l'Indicatif"-dədirsə, budaq cümlənin zamanı olduğu kimi qalır.

Sara dit: "Je vais chez ma tante".- Sara deyir: "Mən xalamgilə gedirəm"

Sara dit qu'elle va chez sa tante.- Sara deyir ki, o, xalasıgilə gedir.

Lucie dit: "Hier mon cousin est revenu de Paris",-Lüsi deyir: "Dünən mənim bibim oğlu Parisdən qayıdıb". Lucie dit que son cousin est revenu de Paris hier.-Lüsi deyir ki, onun bibisi oğlu dünən Parisdən qayıdıb.

Mare dit: "Je partirai pour Lyon".- Mark deyir: "Mən Lyona yola düşəcəyəm". Mare dit qu'il partira pour Lyon.- Mark deyir ki, o, Lyona yola düşəcək.

Əgər baş cümlə "Passé composé" və ya "Imparfait" zamanındadırsa, onda budaq cümlədə "Présent de l'indicatif-in yerinə "Imparfait", "Passé Composé"-nin yerinə "Plus-que-parfait", "Futur simple"-in yerinə "Futur dans le passé" işlənir.

Sara a dit: "Je vais (Présent de l'indicatif) chez ma tante". Sara dedi: "Mən xalamgilə gedirəm".

Sara a dit qu'elle allait (Imparfait) chez sa tante.- Sara dedi ki, o, xalasıgilə gedir.

Lucie a dit: "Hier mon cousin est revenu (Passé Composé) de Paris". - Lüsi dedi: "Dünən mənim bibim oğlu Parisdən qayıdıb". Lucie a dit que son cousin était (Imparfait) revenu de Paris hier. - Lüsi dedi ki, onun bibisi oğlu dünən Parisdən qayıdıb.

Marc a dit: "Je partira (Futur simple) pour Lyon". - Mark dedi: "Mən Lyona yola düşəcəyəm". Marc a dit qu'il partirait (Futur dans le passé) pour Lyon. - Mark dedi ki, o, Lyona yola düşəcək.

2. Ümumi sualların çevrilməsi:

a) Budaq cümlə baş cümləyə "si" bağlayıcısı ilə bağlanır və Azərbaycan dilinə geniş tərkibli vasitəsiz tamamlıq kimi tərcümə olunur.

b) "Si"-dən sonra söz sırası nəqli cümlədəki kimi sıralanır.

c) "Dire" feili "demander" feili ilə əvəz olunur.

Nicolas dit à son ami: "Viendras-tu chez nous?" - Nikola öz dostuna deyir: "Sən bizə gələcəksənmi?" Nicolas demande à son ami s'il viendra chez eux. - Nikola öz dostundan onlara gələcəyini soruşur.

Maman dit à Anne: "Peux-tu m'aider?" - Ana Annaya deyir: "Mənə kömək edə bilərsənmi?"

Maman demande à Anne si elle peut l'aider. - Ana Annadan ona kömək edə bilməsini soruşur.

3. Xüsusi sualların çevrilməsi:

a) Əgər sual cümləsi "qui, qui est-ce qui, qui est-ce que, lequel, laquelle, quel, quelle, où, quand, comment, combien de, pourquoi" sual sözləri ilə başlayarsa, onda bu sual sözləri budaq cümlənin əvvəlində gəlir, onlardan sonra söz sırası nəqli cümlədə olduğu kimi sıralanır və Azərbaycan dilinə geniş tərkibli vasitəsiz tamamlıq kimi tərcümə olunur. [2.s 172]

b) "Dire" feili "demander" feili ilə əvəz olunur.

Henri dit: "Qui cherches-tu?" - Anri deyir: "Sən kimi axtarırsan?" Henri demande qui je cherche. - Anri mənim kimi axtardığımı soruşur.

Maman demande à sa petite fille: "Pourquoi pleures-tu?" - Ana balaca qızından soruşur: "Nə üçün ağlayırsan?" Maman demande à sa petite fille pourquoi elle pleure. - Ana balaca qızından nə üçün ağladığını soruşur.

La vendeuse dit: "Quelle chemise voulez-vous choisir?" - Satıcı deyir: "Siz hansı köynəyi seçmək istəyirsiniz?" La vendeuse demande quelle chemise nous voulons choisir. - Satıcı bizim hansı köynəyi seçmək istədiyimizi soruşur.

La petite Nina a dit à sa sœur aînée: "Quand irons-nous nous promener?" - Balaca Nina böyük bacısına dedi: "Biz nə vaxt gəzməyə gedəcəyik?" La petite Nina a demandé à sa sœur aînée quand elles iraient se promener. - Balaca Nina böyük bacısından nə vaxt gəzməyə gedəcəklərini soruşdu.

c) Əgər sual cümləsi "qu'est-ce qui" sual əvəzliyi ilə başlayarsa, onu vasitəli nitqə çevirəndə bu sual əvəzliyi "ce qui" ilə əvəz olunur.

Sylvie a dit à sa copine: "Qu'est-ce qui est arrivé?" - Silvi rəfiqəsinə dedi: "Nə baş verib?" Sylvie a demandé à sa copine ce qui est arrivé. - Silvi rəfiqəsindən nə baş verdiyini soruşdu.

d) Əgər vasitəsiz nitq "que, qu'est-ce que" sual əvəzliləri ilə başlayarsa, vasitəli nitqdə onlar "ce que" ilə əvəz olunur.

Le père demande à André: "Que lis-tu?" - Ata Andredan soruşur: "Sən nə oxuyursan?"

Le père demande à André ce qu'il lit. - Ata Andredən nə oxuduğunu soruşur.

4. Əmr cümlələrinin çevrilməsi:

a) Budaq cümlə baş cümləyə "de" sözünü vasitəsi ilə bağlanır, xəbər məsdərlə əvəz olunur və Azərbaycan dilinə geniş tərkibli vasitəsiz tamamlıq kimi tərcümə olunur. [2.s 172]

"Dire" feili "demander" feili ilə əvəz olunur.

Cécile dit à Claire: "Ecris-moi vite!" - Sesil Klerə deyir: "Tez-tez mənə yaz!"

Cécile demande à Claire de lui écrire vite. - Sesil Klerdən tez-tez ona yazmağı xahiş edir.

Le professeur a dit à ses élèves: "Réfléchissez bien avant de répondre!" - Müəllim şagirdlərinə dedi: "Cavab verməmişdən qabaq yaxşı fikirləşin!"

Le professeur a demandé à ses élèves de réfléchir bien avant de répondre.- Müəllim şagirdlərindən cavab verməmişdən qabaq yaxşı fikirləşmələrini tələb etdi.

b) Budaq cümlə baş cümləyə "que" bağlayıcısı ilə bağlanır, budaq cümlənin xəbəri "Subjonctif présent" ilə əvəz olunur. "Dire" feili "demander" feili ilə əvəz olunur, Maman dit à son fils: "Fais vite tes exercices!"- Ana oğluna deyir: "Tez tapşırıqlarını et!" Maman demande à son fils qu'il fasse vite ses exercices.- Ana oğlundan tələb edir ki, o, tez tapşırıqlarını etsin.

Vasitəsiz nitqi vasitəli nitqə çevirərkən zaman uzlaşmasında zaman zərfləri aşağıdakı kimi dəyişir.

İndiki zamana aid	Keçmişə aid	Gələcəyə aid
Aujourd'hui- ce jour-là Ce matin- ce matin-là Ce soir – ce soir-là Maintenant- à ce moment- là,alors En ce moment,en ce moment-là,alors	Hier- la veille Il y a deux jours- deux jours Le samedi dernier- le samedi précédent	Demain- le lendemain Lundi prochain- le lundi suivant Dans deux jours- deux jours après

Discours direct :	Discours indirect :
Aujourd'hui	Ce jour-là
Lundi, il a dit ' On aura beaucoup d'exercices aujourd'hui.'	Lundi, il a dit qu'on aurait beaucoup d'exercices ce jour-là.
Demain	le lendemain
Lucile a dit 'Je reviendrai demain.'	Lucile a dit qu'elle reviendrait le lendemain.
Hier	la veille
La semaine dernière, elle m'a dit 'Je les ai achetés hier.'	La semaine dernière, elle m'a dit qu'elle les avait achetés la veille.
Jour/année/lundi ... Prochain	Jour/année/lundi... Suivant
En fin d'année, mon frère m'a dit : 'J'aurai mon bac l'année prochaine.'	En fin d'année, mon frère m'a dit qu'il aurait son bac l'année suivante. (vous entendrez aussi 'l'année prochaine')

Le discours indirect libre (Sərbəst vasitəli nitq): Bu növ vasitəli nitqdən əsasən yazılı ədəbiyyatda istifadə olunur. Bu nitqdən istifadə olunduğu zaman dinləyici və oxucu, özünü söhbətin getdiyi məkanda hiss edir. Belə ki, dırnaqlar və qoşa nöqtə atıldıqdan sonra heç bir şey dəyişdirilmədən olduğu kimi verilir. [1.s 119]

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Прагматические особенности английских газетных заголовков

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Ключевые слова: прагматика, семантика, контекст, газетный заголовок.

Key words: pragmatics, semantics, context, newspaper headline.

Прагматика включает в себя процесс с упором на связь между произносимым языком и контекстом, в котором он используется, в то время как семантика влечет за собой концептуальный процесс, концентрируясь на значении выражений.

[1, с. 22]. Пользователи языка знают или предполагают, что реципиенты могут сделать вывод об этих подразумеваемых предложениях на основе общих знаний и, таким образом, создать ментальную модель дискурса. «Заголовок в нескольких словах описывает суть сложной новости. Быстро информирует и точно и вызывает любопытство читателя» [5, с.35]. Заголовки новостей особенно важны для читателей как они понимают новостной текст; они являются маркерами, ориентирующими мониторное внимание, восприятие и процесс чтения [7, с.587]. Темы и ремы кратко реализуются в заголовках и ведущих абзацах. Согласно Dijk [5, с.77] заголовки изображают единство дискурса как источника информации; и читатели со своими собственными убеждениями и идеями обычно принимают предлагаемые СМИ определения насколько важна и емка опубликованная информация о событии. Кресс [4, с.57] утверждает, что определенные высказывания не только выражают, но и организуются для определенной идеологической цели.

Газетные заголовки действуют как предвестники новостных сообщений, более того, заголовки раскрывают социальные, культурные и национальные представления и часто заголовки считаются аудиторией более важными, чем новостные статьи. Их влияние, вероятно, будет больше на читателей из-за определенных языковых особенностей, которые делают их запоминающимися и эффективными [2] Develotte & Rechniewski утверждают, что газетные заголовки это не только содержание в двух словах, но они могут дать подсказки о том, как расшифровать содержащиеся в них сообщения. Понимание единства предполагаемой и перспективной информации позволяет читателю понять социальную и культурную ссылки. Заголовки как часть целого сигнализируют о фактах в новостной статье, в то время как статья несет в себе основное средство интерпретации и оценки [3,с.89] Для лучшего понимания так называемого «трудового разделения» между заголовком и статьей, вклад прагматических и смысловых аспектов также должны быть тщательно рассмотрены.

Согласно социальной репрезентации Ван Дейк [5,с.601] указывает, что контекстные модели связаны с общими, разделяемыми социальными представлениями, которые включают социокультурные, групповые знания, отношения, нормы, ценности, идеологию и другие формы социального познания членов группы разделяют с другими членами той же социальной группы или сообщества. Эти социальные репрезентации играют роль в самом построении новых контекстных моделей. В зависимости от этих репрезентаций пользователи языка могут учиться на своем повседневном опыте, точках зрения на социальном познании, социальных представлениях и других формах социально разделяемых убеждений. Он также утверждает, что помимо важности социальных знаний, пользователи языка нуждаются в семантических и прагматических знаниях языка.

Ван Дейк [6] утверждает, что контексты как ментальные модели релевантных коммуникативных ситуаций не просто личные интерпретации ситуаций, но также основаны на социально разделяемом понимании времени, места, участников, их роли и идентичности, отношения власти и т.д. Для правильной интерпретации сигналов и маркеров в заголовке и тексте пользователям языка нужны знания как общие, так и фоновые знания.

Таким образом, в заголовке взятой из газеты Daily Mail (April 16, 2023) *Coronation cull: Dukes are left off the guest list for King Charles's big day leaving some of Britain's most senior aristocrats shocked and dismayed* репортер разделил статью на несколько частей в зависимости от последовательности событий. В данном газетном заголовке автор использует антитезу *shocked and dismayed* как риторическое противопоставление образов, состояний, связанных между собой общей конструкцией и внутренним смыслом.

В заключении нашего исследования мы пришли к следующим выводам:

Заголовки содержат различные прагматические и семантические аспекты. Они предполагают идеи и заставляют читателей активизировать свои общие знания, чтобы прийти к правильным выводам.

Заголовок является составной частью, т. е. частью статьи, которая предоставляет читателям интерпретацию и информацию, которая тесно связана с заголовком.

Основная функция заголовков – кратко информировать читателя о последующем тексте. В то же время контекст помогает прояснить предпосылки заголовка и заставить читателей активизировать свои мысли и знания, чтобы сделать правильные выводы.

Цель публицистического стиля — оказать глубокое влияние на общественное мнение и убедить читателей принять высказанную в статье точку зрения, реализацию любой из которых вряд ли можно рассматривать как успех.

Через семантическое знание читателей (ссылки, метафоры, следствия, когерентность, связность и т. д.), читатель сможет сделать выводы, чтобы прийти к предполагаемому смыслу автора.

Прагматическое знание помогает читателям через их взаимные знания о культуре, обществе правильно воспринять смысл контекста.

Ясно, что особенности контекста как часть критического дискурса могут влиять на сознание людей и контролировать их, например, знания или мнения.

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Articles and types of articles

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Key words: style of an article, genre of an article, types of articles, feature articles, editorials, book review articles, lifestyle articles, opinion articles, news articles, how-to articles, investigative articles.

Abstract. Nowadays, articles can cover different genres and styles. According to genre there can be informational, entertaining, opinion, educational articles. If we talk about the style of an article, an article can be complicated, frequently using complex words and phrases or exploring more in-depth ideas. On the other hand, an article can be more conversational and informal for its style and intend to engage a younger audience. The second factor that influences article style is the length of the piece. There can be long articles and short articles. Long articles have often several thousand words in length, and they are designed to provide deep insight into a specific topic. Short articles, as we may expect are intended to be more compact and easier to read. They provide a simple overview of a topic or share particular information in as few words as possible. Short articles also generally contain shorter sentences. Certain article styles are more common in magazines and journals. In magazines and journals you might see book review articles, clinical case studies, lifestyle articles, shorts, opinion articles etc. In newspapers we can find local news articles, national news articles, international news articles. Local news articles focus on the recent happenings in our neighbourhood. National news articles focus on what is happening in the whole country. International news articles focus on events that are happening outside the country. In newspapers we can also find different types of articles such as news articles, columns, interview-style articles, investigative articles, feature writing articles etc. There are different article styles that are used in the online or digital world. We can see them while browsing the web than in newspapers or magazines. These are blog posts, original research articles, essays, how-to articles, sponsored articles, review articles etc.

Newspapers are rich sources of information. They can provide you with the most recent data and updates about significant and noteworthy events happening across the world. Nevertheless, you must get familiar with all the types of newspaper articles first in order to easily find the kind of information you are seeking for. There are countless different types of articles in today's journalistic and publishing worlds. Some are designed specifically to inform and educate readers, like editorial articles and newspaper reports. Others are intended for entertainment purposes or to provide an opinion on a particular topic. Any writer creating pieces for a website, magazine, newspaper, or other publication must clearly understand the different article genres, styles, and formats. After all, each type of article is aligned with its own specific purpose. The pieces produced for a magazine may differ from those created for a traditional newspaper publication. Today, we will take a closer look at the various types of articles in production. We'll be exploring the different use cases for these articles, what makes them unique, and what writers may need to consider when producing their own content.

When defining the different types of articles available today, genre and style are the first components worth looking at. First, modern articles can cover a range of other "genres." The most common types of article genres include: 1. **Informational:** Informational articles are generally designed to provide objective insights into a topic. News reports and press releases are common forms of "information-led" articles. They don't include a lot of opinion or hyperbole and are less focused on entertainment. 2. **Entertaining:** Entertaining articles can include some factual information, but the focus is more on keeping the reader entertained and eliciting an emotional

response. There's often more personality in the content and a greater focus on fun and frivolity.

3. **Opinion** : Opinion-style articles provide insight into a topic from a certain person's perspective. While facts may be referenced here, the purpose of the piece is to convey the writer's thoughts and feelings or to argue a specific mood.

4. **Educational** : Educational articles are focused heavily on helping readers to learn something. They may look at various opinions, facts, and sources to enlighten the reader. How-to articles are an excellent example of this. Related to the style of articles, most writers consider two separate things. The first is the specific tone of voice used in writing. For instance, an article can be sophisticated and authoritative, often using complex words and phrases or exploring more in-depth ideas. It's also possible to explore a more conversational and informal style intended to engage a younger audience. The second factor influencing article style is the length of the piece. In today's digital world, articles are often separated into two key segments. There can be long articles and short articles. Long articles have often several thousand words in length, and they are designed to provide deep insight into a specific topic. Long articles can handle more complex subject matters or break a complicated topic into smaller segments. These articles are more common in the online landscape, where it's possible to create digital books and lengthy web pages discussing a concept. Many newspapers and magazines limit how many words they can publish on each page. Short articles, as we may expect are intended to be more compact and easier to read. They provide a simple overview of a topic or share particular information in as few words as possible. These pieces can be up to 700 words long, depending on the nature of the publication. Short articles also generally contain shorter sentences.

As mentioned above, the different types of articles you encounter in today's publishing world will often depend on the type of publication you read. Certain article styles are more common in magazines and journals than they would be on websites and newspapers. Here are some of the different types of magazine articles you might see:

1. **Book review articles**- One of the most common types of magazine articles is a "book review" piece. These articles generally appear in specific magazines intended to attract a literary audience or look at a specific niche. It's also possible to find book reviews in academic journals. The purpose of a book review article is to provide a behind-the-scenes look at the content of a recently released book. Usually, these pieces are relatively short, as the writer aims to generate interest in the other publication rather than giving away all available information. Some companies publish entire sections in their magazines dedicated to miniature reviews of the latest books. Additionally, books don't have to be the only media covered. Creator review articles can also look at movies and musical releases in some magazines.

2. **Clinical case studies**- More common in journals than typical magazines, clinical case studies are written exclusively for a particular group of subscribers. For example, doctors and physicians may subscribe to a medical journal to get insights into the case studies of various medical trials and patient reviews. These pieces are both educational and informative. They're often written to a very high academic standard and will include a lot of "industry jargon" related to the niche for the case study. Some case studies can have very high word counts because they outline several factors about the case, the methodology used, and the trial outcomes, all bundled into one.

3. **Lifestyle articles**- The most common form of magazine article, a lifestyle article focuses on the issues related to the lifestyle of the particular audience the magazine wants to reach. Think about the pieces you'll see in publications like Time or Men's Health. They can look at things like how entrepreneurs achieved their success or how you can improve your health with certain practices. Lifestyle articles can also address the concerns of a group in a specific locale or area. A local magazine might provide insight into some of the top schools in the region or what kind of new retail stores are opening. Lifestyle articles are often more personalized and niche-oriented than other types of articles online and in print.

4. **Shorts**- Because magazines are often more compact than newspapers or website blogs, many of the articles produced are short and snappy in length. These "shorts" can cover various topics, from what's happening in a celebrity's life to

what's happening on television. Some magazines will also use shorts to provide a brief overview of a relevant news topic. The nature of "shorts" in a magazine will often be dictated by the specific audience the publication wants to reach. For example, these articles will usually cover things like workout routines, nutrition tips, and cosmetic reviews in a health and beauty piece. 5. **Opinion articles** - While opinion articles can appear in online publications and newspapers, they're most common in magazines, where the focus is on forming an emotional connection with the reader. Many magazines focus on specific niches and take a more personalized, colloquial approach to writing. In contrast, newspapers are often more focused on simply conveying the facts. Opinion articles are often short, straight to the point, and focused on a specific topic. In some cases, they review an event that might be relevant to the reader. For example, a fashion magazine might produce an opinion article about celebrities' outfits for an awards event. Opinion articles can reference facts and studies to make their perspective more credible. However, the focus is mostly on sharing a writer's unique thoughts.

Depending on the style of the newspaper you choose to read, the articles you see in one of these publications may overlap with magazines. In the UK and the US, more "tabloid" style newspapers are generally filled with a wider range of reviews, opinion articles, and trend-focused pieces intended to highlight current topics. However, some types of articles are more common in newspapers than anywhere else. In newspapers we can find local news articles, national news articles, international news articles. A **local news article** focuses on the recent happenings in your neighbourhood. An example of a local news story would be an article on city council meeting. Other examples of local news stories can be articles about local sports, local crime and justice, local weather, local business and economy, local events. A **national news article** focuses on what is happening in the whole country. An example of a national news article would be an article on the Senate passing a new bill. Other examples of national news articles can be political or trade news magazines, club newsletters, technology news websites. An **international news article** focuses on events that are happening outside the country. A story on an influenza outbreak in Russia would be considered an international news story. There are other article styles you might see in a newspaper: 1. **News article** - The most common type of article among newspapers, the news article highlights the latest happenings in the world or a specific space. News articles are generally written from an objective and informative perspective, with minimal opinion or personal insight. News stories get straight to the point and relay the facts rather than going in-depth into any background details. Sometimes, it is possible to extend the length of a news article to make it more like an "editorial" piece. In these situations, the articles become more in-depth and may include additional information, such as an interview with a relevant party. However, typical news articles are generally relatively short and compact, with exceptionally little fluff. 2. **Columns** - A column is a dedicated piece within a newspaper or magazine to highlight the author's personality. Writers with specific background knowledge and experience are often given "columns" to which they contribute content monthly or weekly. Columnists all have their own unique ways of personalizing their sections. Some respond to questions issued by the public, offering advice and opinions on certain situations. Other columnists may write about their personal experiences, thoughts, and feelings. This is often common when the writer already has a strong personal brand and presence. A celebrity might create a column talking about their unique lifestyle and providing insight into their lives for fans and followers. 3. **Interview-style articles** - Common in magazines, newspapers, and online publications, interview-style articles replicate the conversation between two or more people. The content is often presented like a conversation, with a name or tag connected to each section, showing which person said what in the interview. This article doesn't add any extra context or explanation to the questions or answers but simply provides a clear view of the conversation. Question-and-answer style articles are often common among magazines and newspapers because they allow writers to collect behind-the-scenes insights from people relevant

to a specific story. In some cases, interview articles will have “lead paragraphs,” which introduce the reader to the discussed topic, and a conclusion section. 4. **Investigative articles-** Perhaps one of the most informative and educational articles for most people, an investigative piece requires several skills on behalf of the journalist, such as researching different topics, collecting insights from industry leaders, and more. An investigative article examines the different perspectives and information surrounding a topic. Once the writer has collected as much data as possible for their piece, they arrange it into a format designed to give the reader a complete overview of the idea. Investigative articles can often be challenging for writers because they require significant research and data. Sometimes, the people investigative journalists turn to for assistance and quotes won't be as reliable as they seem. 5. **Feature writing articles-** Another extremely common type of article in both newspapers, and magazines, “feature pieces” offer in-depth coverage on a specific topic. These articles can cover certain events related to the industry covered by the newspaper, trends, and even people. Feature pieces are often a lot longer than other forms of articles produced by newspapers, as they aim to cover the main idea in depth. In some feature writing pieces, the content producer will attempt to provide enough detail to ensure the readers and viewers can understand every perspective connected with the story. Feature articles also regularly receive awards from journalism groups, thanks to their unique insights.

There are different article styles that are used in the online or digital world. As the way we consume information and entertainment has evolved over the years, the different types of articles available have expanded. The introduction of the online landscape has given content creators and writers a new platform through which they can share ideas. Here are some common types of articles you'll be more likely to see when browsing the web than in newspapers or magazines. 1. **Blog posts-** In some cases, blog posts are considered their own genre of written content, entirely separate from the “article” concept. However, many readers see articles and blog posts as the same. A blog post is a rather versatile form of content, as it can cover a huge range of different topics and genres and come in many different styles and sizes. Some blog posts are short and straight to the point, covering valuable information about a specific topic. Others are intended to be more in-depth, with multiple sub-headings related to a certain idea.

Blog posts are usually intended more for entertainment than educational purposes, and may include a higher degree of opinion than traditional articles. 2. **Original research articles-** The original research article got its start in academic journals published by certain groups around the world. However, the rise of the internet has made it much easier for professionals to find information about specific discoveries online. These articles are extremely detailed and provide all the information users need about a case study or report. An original research article will often have a range of sections covering the background of the study and the methods used to gather information. They also include any hypotheses the researchers may have and an interpretation of the study results. Often, these articles require a high level of education to fully understand, as they feature significantly technical jargon. 3. **Essays-** While many people consider essays to be lengthy and drawn-out pieces of content, this is rarely the case. An essay is shorter and more straightforward than many other types of articles. They are one of the most opinionated article formats available, as they cover a certain person's specific thoughts and feelings or personal view of a topic. Of the many different types of articles found online, essays are less common among entertainment websites and may appear more often in genre-focused publications. 4. **How-to articles** - One of the most popular article styles among many online sites today, How-to articles are a specific form of educational content intended to enlighten and inform their audience. These highly specific pieces cover the steps a user needs to complete to achieve a goal. For example, you may read a how-to article that covers how to set up a new piece of software or build a chair. How-to pieces are frequently used in the online world to create a sense of “thought leadership” for the publication and demonstrate the knowledge of a writer. These tools can also be useful for creating

positive relationship with readers. 5. **Sponsored articles**- Many types of articles produced online fall into three categories: owned, paid, and earned media. Sponsored articles are a form of “paid media,” which means the company or individual referenced by the article pays to have the content displayed on a particular website. These pieces are also seen as “native content” as they read and look similar to a standard editorial but aim to promote a product or service subtly. Sponsored articles specifically cover information about a certain topic, product, or service being offered by another company. Usually, the aim is to showcase the offering in the most positive way possible to drive purchases. 6. **Review articles** - A review article can either be earned, owned, or paid media, depending on the structure. Some companies pay for influential figures and publications to review their products and services, to help them reach a wider audience and earn credibility. Other companies simply benefit from the reviews customers naturally create and share online. In some cases, a company may even produce reviews of its own products, comparing them to other well-known solutions in a certain market. These articles combine fact and opinion, including genuine information about the product or service, aligned with a writer’s thoughts and feelings.

The different types of articles available throughout the online and offline worlds today ensure people have access to a constant flow of information and entertainment. While some articles are intended to provide factual information, others can expand your horizons by giving you unique opinions and insights. When writing an article, experts always need to think carefully about the message they want to send, the type of readers they hope to reach, and the outcomes of their content.

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Pedagogical Sciences

Specificity of the development of foreign language communicative competence based on the method of discussion

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ABSTRACT

The present study aimed to experimentally test the effectiveness of utilizing the method of discussion to enhance communicative competence in foreign language lessons at the senior stage of comprehensive school education. The results of the study indicated that employing the discussion method significantly contributed to the development of students' communicative skills. Building upon these findings, a set of language tasks integrating game technologies was devised to further enhance the learning experience and foster students' proficiency in the foreign language.

INTRODUCTION

1. Pilot-experimental work on the development of foreign-language communicative competence based on the method of discussion in teaching a foreign language.

According to the Encyclopedic Dictionary, a discussion (Latin *discussio* - consideration, research) is a dispute aimed at achieving the truth and using only correct methods of persuasion. This is one of the most important forms of communication, a method of solving problems of describing reality and a peculiar way of cognition that allows you to better explain what is not fully clear and has not yet found a convincing justification. Even if the participants in the discussion do not come to an agreement in the end, they certainly achieve a better understanding during the discussion. Moreover, it is also useful in that it reduces the moment of subjectivity, while providing general support for the beliefs of an individual or group of people. The truth reached as a result of the discussion becomes the common property of both disputing parties. [].

The outcome of the discussion should not be reduced to the sum of the points of view expressed on the subject under discussion. It should be a synthesis of objective and necessary features inherent in the subject under discussion. In other words, the result of the discussion should be expressed in an objective judgment supported by all participants in the discussion or their majority. Thus, as a result of the discussion, the solution to the problem is formed clearly and clearly, the beliefs of each of the parties become justified.

In pedagogy, the concept of educational discussion is widely used. This is a method of teaching, which consists in conducting educational group discussions on a specific problem in relatively small groups of students (from 6 to 15 people). It differs from other types of discussions in that the novelty of its problems applies only to a group of people participating in the discussion, i.e., the solution to the problem that has already been found in science is to be found in the educational process in this audience.

The educational effect of the educational discussion is determined by the opportunity provided to the participant to obtain a variety of information from the interlocutors, demonstrate and improve their competence, check and clarify their ideas and views on the problem under discussion, apply existing knowledge in the process of joint solution of educational problems.

Thus, the developmental function of the discussion is associated with stimulating the creativity of students, developing their ability to analyze information and reasoned, logically built proof of their ideas and views, with an increase in the communicative activity of students, their emotional involvement in the educational process.

2. Methodical bases of application of a method of discussion as means of development of communicative competence of pupils of the senior classes

Discussions can be spontaneous, free and organized.

Discussion in the conventional sense (from the Latin *discussio* - consideration, research) is a discussion of an issue by a group of people. A conversation between two or more people always has something of a discussion: disagreements, contradictions are constantly present in our lives. The need to find a common language, to come to an agreement is a prerequisite for the existence of human society. Discussion is a procedure for developing a common opinion, removing contradictions within the team [9. C. 2]. Practice shows that the discussion can be conducted with varying severity of confrontation. It can be a dispute, a debate, a polemic, a dispute. In any case, in order to conduct a discussion, it is at least necessary to have two different points of view, two different approaches to solving the relevant issue or problem. Although, as a rule, there are much more of them. In fact, each of the participants in the discussion often has his own point of view, his own view on the solution of the problem. Discussion is often identified with argument and controversy. However, in contrast to the conflict and struggle of opinions inherent in the dispute and controversy, the discussion is characterized by its purposefulness and desire for compromise. Many authors consider discussion as an activity that, unlike a dispute, does not divide, but connects. If in a dispute the emphasis is shifted towards disagreements and discrepancies of opinions, then in discussion opinions are compared and expressed in order to search for and identify the truth. This principle of the positive orientation of the discussion to a positive result distinguishes it from the dispute []. Signs of discussion are associated with organization, orderliness, collective activity to clarify the truth or falsity of each thesis, its means are not the opinions of the parties, but reasonable positions. The purpose of any discussion is to achieve the maximum possible degree of agreement of its participants on the problem under discussion. The means used in the discussion should be recognized by all participants. The outcome of the discussion should not be reduced to the sum of the points of view expressed but expressed in an objective judgment supported by all participants in the discussion or their majority. Thus, in the discussion, a clearer and clearer formulation of the solution to the problem is crystallized, the moment of subjectivity is removed, eliminated to a certain limit: the beliefs of one person or group of people receive the proper support of others and thereby objectify. An important characteristic of the discussion is argumentation. When discussing a controversial (debatable) problem, each side, opposing the opinion of the interlocutor, argues its position. The effectiveness of the discussion largely depends on the reliance on logic, on the possession of the art of argumentation. The ability to prove one's point of view is a necessary condition for a culture of discussion. Throughout the world, there is now a growing interest in the problems of argumentation, works on the theory and practice of discussion are being published []. This is clearly a steady trend associated with the need to master the culture of discussion by the broadest masses. The study of logic and argumentation involves the assimilation of certain knowledge from the fields of personality psychology, psychology of thinking, social behavior, and theory of knowledge.

Argumentation is an art that can be comprehended only with a deep assimilation of certain knowledge from the fields of personality psychology, psychology of thinking, social behavior, theory of knowledge and the acquisition of solid, practical skills. The theory of argumentation, which took its first steps in the time of Aristotle, was based on logical rules used in rhetorical practice. The logical approach to argumentation meant getting a conclusion based on the premises, and the rhetorical approach meant trying to convince the audience. In discussion, polemics, it is constantly necessary to prove or refute certain provisions, to convince opponents. Therefore, the polemicist needs to think clearly, logically build his speeches, give reasoned answers, that is, have a high culture of thinking. To do this, it is important to observe the basic laws of formal logic [].

The first law of logic - the law of identity - is formulated as follows: "Every thought in the process of this reasoning must have the same definite, stable content." This means that during reasoning it is impossible to replace one object with another. The law of identity requires in any reasoning the certainty of thought. It is directed against vagueness, pointlessness of judgments. The next law of logic, the law of contradiction, is: "Two opposite thoughts about the same subject, taken at the same time and in the same relation, cannot be simultaneously true." This law was first formulated by Aristotle. He considered it the basic law of thought. The law of contradiction prohibits two contradictory statements from being true at the same time only under certain conditions. First, we should talk about the same subject. The statement must refer to the same time. The subject must be considered in the same respect. The law of contradiction helps polemicists to be consistent in thinking, in presenting their point of view, avoids ambiguity, logical inconsistency. The law of the excluded third, formulated, like the previous ones, by Aristotle, reads as follows: "Of two contradictory statements at the same time and in the same respect, one is necessarily true." For the proper conduct of the discussion, controversy, compliance with the law of the excluded third is mandatory. Violation of it leads to a logical contradiction in statements, which prevents the adoption of a fair decision.

The next law of logic is the law of sufficient reason: "Every correct thought must be justified by other thoughts, the truth of which has been proved." Correct thinking must be not only definite, consistent and consistent, but also evidence-based, reasonable. This law was formulated by Leibniz. It reflects the most important feature of the world around us. In nature and society, everything is interconnected and interdependent. No phenomenon can occur if it is not prepared by a previous development. The law of sufficient reason does not allow unsubstantiated statements, conclusions, requires convincing confirmation the truth of thoughts. Knowledge and application of the laws of logic disciplines thinking, increases its culture, allows you to make your speech more effective, and helps to avoid logical errors. Logical laws have an independent meaning and operate independently of the will and desire of people. They record the centuries-old experience of people's activities. The importance of logic for argumentation is explained biologically and is understood as the principle of least effort, or the principle of economy of thinking. The presence of logic in language products is associated with the desire for ideality and rationality, maximum reasonableness, since the ideal tendency of logical thinking, as such, is directed towards rationality []. The rules of logic are a kind of intellectual tools that allow you to put thoughts and reasoning in order. The communicative effect of the message largely depends on the logical culture of the individual, since no arguments will have an impact if they are not logically related. A necessary condition for the effectiveness of the discussion is the certainty of the positions and views of its participants. If the opponent's point of view is not clearly expressed during the discussion of a controversial issue, it is difficult to argue with him. The discussion becomes more fruitful if the participants have a common starting position, an initial understanding to discuss unresolved issues. When they talk about the commonality of initial positions, they do not mean a single point of view on the issues under discussion. The opinions of the participants in

the discussion may be different, but there must be a common goal, the desire to find the right solution, the desire to understand the controversial issue and achieve the truth. The success of the discussion largely depends on the ability of its participants to correctly operate with concepts and terms. It is necessary to be able to identify the basic, basic concepts related to the subject of discussion, carefully select the terms necessary for the discussion of the problem put forward. For all participants to understand the words used in the same way, you should first clarify the meaning of the basic terms, stipulate the meaning that everyone puts into certain words. Since the ambiguity of words is fraught with the possibility of different interpretations, the inaccurate use of terms, polysemantic words by the participants in the discussion can complicate communication, prevent the development of a mutually acceptable solution to the problem under discussion.

One of the important requirements of the culture of discussion is mutual respect for opponents. Unfortunately, we often witness that the participants in the discussion are intolerant of people who hold different views, stand on different positions. The desire to understand your opponent, respect for his beliefs are necessary conditions for a fruitful discussion of the problem. Argumentation and rhetoric are implicitly included in any educational systematic course, including a foreign language. Modern rhetoric is interdisciplinary. In its most general form, it is the science of the art of correct speech for the purpose of persuasion, the science of the rules of persuasive communication. The immediate environment of rhetoric is logic, philosophy, hermeneutics, poetics, linguistics, but, unlike the latter, rhetoric deals only with speech, and not with language. The use of the discussion method in teaching a foreign language is the best way to form the basic skills of public speaking and the development of communicative competence in general, since, in addition to the development of language skills directly, the discussion contributes to the formation of the foundations of public speaking. Free, clear, logically constructed speech in the native language is an important characteristic of the speech portrait of an educated person, and knowledge of foreign languages further enriches the linguistic personality. It is known that one of the main reasons for the fear of students to speak publicly in a foreign language is their lack of communication skills and experience in public speaking in their native language. In the traditional school system of our country, they do not specifically teach the skill of speech in Russian language: there is no discipline in the curriculum that provides for students to practice practical actions to master speech as a real form of communication. Therefore, discussions held in foreign language classes can serve as an effective means of teaching speech techniques and tactics. Mastering the skills of conducting discussions in a foreign language will allow in the future not only to communicate effectively with foreigners, but also to speak publicly, speak at international seminars and conferences, and defend one's own opinion also in their native language. The organization of the educational process based on discussion is focused on the implementation of active learning aimed at the formation of reflective thinking, actualization and organization of the experience of students, as a starting point for active communicative activities aimed at joint development of the problem. **The characteristic features of the method are:**

- 1) group work of participants,
- 2) interaction, active communication of participants in the process of work,
- 3) verbal communication as the main form of interaction in the discussion process,
- 4) an orderly and guided exchange of views with the appropriate organization of the place and time of work, but based on self-organization of the participants,
- 5) focus on achieving educational goals.

Discussions can be spontaneous, free and organized. In the educational process, organized discussions are used, which are held according to the rules and in the order established in advance, they are limited in time and closed in space. Discussion sessions can be structured, with elements of game modeling, project; According to the type of participation (according to the form of

conduct), there are team (debates), group (round table), pair discussions. In general, the following forms of discussion have become widespread in the world pedagogical experience []:

A round table is a conversation in which a small group of students (usually about 5 people) participates "on an equal footing", during which there is an exchange of views, both between them and with the rest of the audience. A meeting of the expert group ("panel discussion"), at which the proposed problem is first discussed by all members of the group (four to six participants with a pre-appointed chairman), and then they present their positions to the entire audience.

A forum is a discussion like a meeting of an expert group, during which this group enters an exchange of views with the audience (class, group). A symposium is a formalized discussion in which participants make presentations representing their points of view, and then answer questions from the audience.

Debate is a formalized discussion based on the speeches of participants, representatives of two opposing, rival teams (groups), and refutations. A variant of this discussion is the parliamentary debate.

A court session is a discussion that simulates a trial.

The aquarium technique [10] is a special variant of organizing a discussion, in which, after a short group exchange of views, one representative from the team participates in a public discussion. Team members can help their representative with advice passed on in memos or during a timeout. This type of discussion is usually used when working with material, the content of which is associated with contradictory approaches, conflicts, disagreements. This version of the discussion is interesting because the emphasis is on the process of presenting a point of view, its argumentation. The activity of all participants is achieved through the participation of each in the initial group discussion, after which the group follows the discussion with interest and keeps in touch with its representative. The aquarium technique not only enhances the involvement of students in the group discussion of the problem, develops the skills of participation in group work, joint decision-making, but also makes it possible to analyze the course of interaction between participants at the interpersonal level.

Brainstorming. This is one of the most well-known methods of finding original solutions to various problems, producing new ideas. It was proposed by the American psychologist Alex Osborne [11]. The method assumes that one of the main obstacles to the birth of new ideas is the "fear of evaluation": people often do not express out loud interesting, extraordinary ideas for fear of meeting with a skeptical or even hostile attitude towards them from managers and colleagues. The purpose of brainstorming is to eliminate the evaluative component in the initial stages of creating ideas.

The classic brainstorming technique proposed by Osborne is based on two basic principles - "postponement of sentencing an idea" and "quality is born from quantity." This approach involves the application of several rules. Criticism is excluded: at the stage of generating ideas, the expression of any criticism of the authors of ideas (both their own and others) is not allowed. Those working in interactive groups should be free from fear that they will be judged on the ideas they propose. A free flight of fancy is encouraged: people should try to liberate their imagination as much as possible. It is allowed to express any, even the most absurd or fantastic ideas. There should be a lot of ideas: each participant is asked to submit as many ideas as possible. In the next step, participants are asked to develop ideas proposed by others, for example, by combining elements of two or three ideas. At the final stage, the best solution is selected based on expert assessments. Currently, brainstorming is considered one of the methods of enhancing learning and is at the heart of many business and didactic games.

Discussion stages:

I. Preparation for the discussion. Determination of the topic (subject) of the discussion, the goal pursued by its participants; election of the presenter, distribution of roles (secretary, counting

commission, experts, etc.). Adoption of the agenda, regulations, determination of the sequence of issues submitted for discussion. Choosing a topic for discussion is one of the most difficult tasks facing the study group preparing the discussion. In principle, any topic can be the subject of discussion. Although there are no ready-made recipes here, the following criteria should be followed: 1) It is desirable that the topic be related to the actual problems of our time (ecology, protection of peace, national relations, demography, education, economy, etc.). 2) The topic can be related to the scientific interests of students, with their term papers and theses. 3) The topic should be within the competence of the participants.

A well-chosen topic directly affects the interests of the participants and is the key to an active exchange of views [9. P. 10]. To select a topic in a group, the "brainstorming" method can be used. At the first stage, options for topics for discussion are proposed. At the same time, everyone has the right to express any ideas regarding the formulation of the topic, the formulation of the problem. The most daring and unusual ideas are allowed. The main thing is that no one has the right to criticize or even discuss the statements of comrades. There should be as many ideas as possible (the rule of preference for quantity over quality of ideas). All sentences are recorded by the facilitator. When this list is already large enough, a critical analysis of the topics begins, the best of them is selected. The issue is usually decided by voting.

II. Discussion. Speeches of participants, debates. Discussion of the draft decision, adoption of the final document.

III. Summing up. Discussion and evaluation of the discussion. Comments on the conduct of the meeting, assessment of the role of the facilitator, determination of the contribution of each participant to the discussion. Planning for further discussions. When discussing the outcome of the discussion, it is important to pay attention to both the form (structure) and the content (rhetoric). The following aspects can be considered:

1) The structure of the discussion: the presence of real disagreements, the presence of team leaders, the manageability of the discussion (assessment of the role of the leader), compliance with the stages of development of the discussion, the productivity of the discussion (whether a decision has been made, if so, how clearly it is formulated).

2) The rhetoric of the discussion: Is the topic interesting? How competent are the participants in the issue under discussion? What arguments prevailed? Were there references to general truths, public opinion, traditions, customs, personal experience, examples from life? Was documentary evidence, quotes from authoritative publications, material evidence used? Were logical operations (definition, generalization, comparison, assumption, etc.) used?

Discussion in foreign language classes as an element of the training course differs from discussions taking place in real life, for example, in politics, in science, public life, primarily in its goals. It is not so much important to find a solution to a problem as to acquire certain skills, experience, apply and consolidate existing knowledge and skills during the discussion, that is, the discussion session performs a training function.

The second function, developing, is associated with stimulating the creative activity of students, with the development of their logical abilities, the ability to think independently, argue and prove their point of view, as well as with the formation of a general culture of speech, a culture of discussion and polemical skills.

The third function, educational, is the formation of social competence of students. Group organization of work in the process of problem-based learning leads to the strengthening of interpersonal relationships, develops interaction in the educational microcommunity: the solution of problem problems is carried out, as a rule, in groups of small and medium size. During the discussion, they learn to interact with each other, find common ground, come to an agreement on some issues, develop a common strategy and tactics, sometimes give in and compromise. An extremely important skill that is formed in a discussion lesson is the ability to listen to your

opponent, respect his opinion and understand, or at least try to understand, the arguments of the other side.

The ability to listen is a necessary condition for a correct understanding of the opponent's position, a correct assessment of the existing disagreements with him, the key to successful litigation, an essential element of the culture of discussion. It is no accident that theorists of the art of argument call it the foundation of polemical skill.

Without the ability to listen, no abilities and knowledge, mental acuity and quick reaction will help. This is exactly the skill that we often lack in life, which is why there are many conflicts between people, groups of people and even entire nations. In this regard, the educational value of the discussion can hardly be overestimated.

Another feature of the discussion session is the conditionality of the situation, which is generally characteristic of teaching a foreign language in isolation from the language environment.

Educational goals set certain conditions in which the discussion takes place, and which inevitably carry an element of artificiality, since no methods and technical means make it possible to create a real language environment. It is impossible to completely get rid of this "artificiality", it must be reduced and, if possible, minimized.

When teaching foreign languages, we are forced to limit ourselves to conditioned speech exercises and situations with the help of which motivation is created for a foreign language statement. The process of mastering a foreign language can become effective if it acquires the characteristics of a natural process of language acquisition and comes as close as possible in its basic parameters to the conditions of controlled language acquisition in a natural language situation [4. C. 12]. In educational conditions, it is possible to immerse yourself in the language only on specially selected and methodically organized language and speech material.

The selection of the latter is carried out considering the difficulties in assimilating this material and its importance for communication. Therefore, using the discussion in the educational process, the preparatory stage is of particular importance. Without belittling the importance of the second stage - the discussion itself, which is the culmination of the lesson - it is necessary to devote enough time to the preparation of the discussion, carefully considering and distributing the roles of the participants, the sequence of speeches and, of course, the linguistic side of the lesson: the relevant material should be preliminarily worked out, the necessary lexical units and grammatical structures should be studied and fixed. This does not mean that all responsibility falls on the teacher, and students are deprived of freedom of choice and creativity. The teacher can only set the direction of the discussion, identify the issues of discussion, outline interesting problem situations, and the rest of the work on the search, selection, analysis of information falls on the shoulders of students.

They can actively participate in the choice of topics, the formulation of problems, the definition of the stages of discussion, regulations, summing up, etc. The task of the teacher is to create a situation of development that provides students with freedom and at the same time responsibility in choosing and making decisions, autonomy and independence of action.

The priority of the individual, which is the fundamental principle of the student-centered concept of learning, not only does not reduce the role of the teacher, but also makes his task even more difficult, increases the requirements for him as an organizer of interaction between him and students. When preparing a discussion on the topics of major subjects of a university (for example, economic disciplines), it is assumed that the teacher is familiar with this subject. Ideally, the teacher should be familiar with the specifics and terminology of the major discipline in order to effectively supervise and direct the work of students. However, the teacher's possession of special knowledge cannot be a decisive condition for the successful preparation and conduct of the discussion, since the purpose of the educational discussion in a foreign language is the development of practical skills and abilities, the development of speech clichés and the

actualization of language knowledge acquired as part of the curriculum of the corresponding course. It is the linguistic side of this type of educational activity that should be carefully thought out and provided, of course, by the teacher. The language aspect is an important factor when comparing discussions in foreign language lessons with discussions in the native language.

In a discussion in their native language, speakers make relatively rare grammatical errors, and most listeners, even those who themselves make grammatical errors, do not miss the opportunity to note the most obvious mistakes in the opponent's language, which significantly reduces the value of the speech. Mistakes made by native speakers hurt the ear and cause a smile at best. In discussions as a form of training session in a foreign language, mistakes are inevitable, and they do not cause such a reaction, because all participants are in equal conditions, because the language of discussion is not their native language.

Mistakes, failures are part of the educational process, but their correction should be as productive as possible and beneficial [12,

p.13]. But in this regard, the question arises: how to react to mistakes to the teacher? In a regular lesson, as a rule, mistakes are corrected in one way or another by the teacher. During the discussion, the role of the teacher is different, he does not enter a direct dialogue with students, he observes more and, if possible, directs the course of the discussion. Interfering directly during the discussion in order to correct a particular error can lead to a failure, slow down the pace of speeches and distract from the essence of the problem under discussion. In addition, as you know, some students, for fear of making a mistake, prefer to remain silent rather than participate in the general discussion. At the same time, it is impossible not to react at all to mistakes, especially those that lead to a misunderstanding of statements and, thus, disrupt communication. A teacher acting as a facilitator or participant in the discussion can be offered the following options:

1) fix errors during the discussion and postpone their analysis and correction to the final stage, where the results are summed up, highlighting the grammatical and lexical correctness of the speeches as a separate criterion for evaluating the discussion.

2) correct some mistakes immediately in the process of discussion in the form of clarification questions or grammatically correct repetition of what was said by the participants in the discussions. Another difficult point in the discussion for students is the need to stay all the time within the framework of a foreign language, without switching to their native language, since in the heat of controversy, on the one hand, it is difficult to control oneself, and on the other hand, I want to express more than the known language means allow. Nevertheless, the task of communicating only in a foreign language should be set before the start of the discussion and, if possible, carried out during the discussion. To remove the controlling function from the teacher, you can introduce additional functions-roles into the discussion, which will be distributed among the participants and contain some game elements: prepare color cards in advance that can be used as penalties for using the Russian language; write signs or posters reminding you to speak a foreign language, use sound signals (preferably blurry so as not to interfere with the speakers), etc.

To perform these functions, it is advisable to introduce the role of an observer, which can be performed, and voluntarily, by any of the students who are not confident in their abilities and are afraid to speak out in the presence of stronger students. Of course, these roles (observer, facilitator, secretary, etc.) should be distributed and alternated considering the capabilities and wishes of the students, so that everyone feels involved in the overall process and can be proud of their contribution to the discussion.

CONCLUSION

Interpretation of the results of experimental work.

Summing up, I would like to note some of the advantages of a discussion in a foreign language compared to a discussion in a native language in terms of the development of foreign language communicative competence: the study of a foreign language itself disciplines, organizes, contributes to the development of logical thinking, increases self-control. The latter is very important, because, unlike communication in our native language, when we speak relatively freely, verbose and, succumbing to emotions, we can distract from the topic, then communication in a foreign language, as part of the educational process, involves self-control, the need to build phrases in accordance with clear rules.

The limited vocabulary can, paradoxically, also play a positive role, because the speaker does not need to spend extra effort searching for a synonym or some bright speech pattern, he has at his disposal a certain set of language tools that need to be updated at the right time. Participants in a discussion in a foreign language can sometimes understand each other even better than when communicating in their native language, because they are focused on communication and, as a rule, listen to their opponents in order to adequately respond to their statements.

In their native language, if there is no such attitude, opponents do not listen and do not hear each other, and in this sense, the opponent's language is akin to a foreign language, that is, a foreign, incomprehensible language. To understand a person who speaks a foreign language, you need to learn this language. To understand your compatriot interlocutor, you just need to learn to listen and try to understand the essence of what the other side said. In this sense, discussions in any language are a universal means of teaching interpersonal communication. Paraphrasing the well-known saying: "Truth is born in dispute," one could say: "Personality is born (formed) in discussion." This, of course, is an exaggeration to a certain extent, but, nevertheless, it is important to consider that discussion as an element of the educational process does not aim to find the truth or solve a problem, and this is not a dispute for the sake of an argument. In this case, the value is not only the achieved goal, but also the path to this goal itself [].

As is often the case in sports, the main thing is not to win, but to participate. Thus, the discussion method not only allows you to educate speech culture, but also encourages students to find an independent solution to the problems under discussion, which, in turn, is a stimulus, a driving force of cognitive activity. The use of this method in teaching a foreign language forms a culture of creative thinking in students, creates conditions for the use of personal life experience and previously acquired knowledge for the assimilation of new ones.

In the process of discussing and solving problems within the framework of controlled group communication, participants develop the ability to act in the interests of the group, there is an attentive attitude to the interlocutors, interest in other points of view, respect for the opinions of others, which contributes to the formation of the team. The use of the discussion method in conjunction with other research and problem methods makes it possible to prepare a specialist who thinks and understands various problems, who can navigate in rapidly changing information flows and is ready for an open and constructive dialogue with colleagues not only from his own country, but also from abroad. Thanks to these methods, future specialists will learn how to create models of scientific research, decision-making models that they can apply not only in their professional activities, but also in everyday life, in the process of communicating with representatives of other cultures.

Thus, it can be concluded that the discussion is highly effective for consolidating information, creative understanding of the material studied, the formation of value orientation, as well as the formation of a number of communicative skills [].

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DEVELOPMENT OF STUDENTS' SOCIAL INTERACTION SKILLS IN ELT

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Key Words: Social Interaction, Cooperative learning, Intercultural Communicative Competence, Motivation, English language teaching, Communicative Competences, Group discussions, Group projects, Sociolinguistics.

The presented abstract of the research paper titled "Development of Students' Social Interaction Skills in ELT" overviews the main aspect of the research work and describes the results, findings and their practical value for the future research in the field of ELT in Kazakhstan. Overall, the paper starts with the discussion of the social interaction skills in the educational field of the country. The main argument for the statement is based in the necessity to maintain the position of the country at the world's level. In the context of modern society Kazakhstan faces numerous challenges of the developing country. Overall tendency of globalization, integration of Kazakhstan into economic, educational, cultural and social world's life puts high requirement for the practical knowledge of *Lingua Franca*, English language on the people of Kazakhstan, to be able to maintain and develop the position of our country. Kazakhstan's development over the years has been significant, and consequently it influences the field of education as well in the form of educational reforms. The main aim of these reforms is to develop qualified and highly-educated citizens.

As Kazakhstan is becoming a part of the global multicultural and multilingual community, the teachers of English language should become aware of their role in the development of learners' readiness and ability to become the part of this community. With the multiple changes in educational field, taking place under the influence of the internal and external factors, the teachers face the new paradigm of education and transition from knowledge-centered to competence approach and to learner-centered classroom, social interaction skills became one of the highest priorities of educational process. Mainly due to the fact that it retrieves great opportunities for Kazakhstani people to learn languages in 21st century.

The object of the research is the process of foreign language teaching to learners of pre-intermediate level.

The subject of the research is the creation of methodology of teaching social interaction skills to students of Pre-intermediate level.

The leading idea of the research: the methodology of teaching social interaction is based on the gradual formation of communication skills taking into account sociolinguistic and sociocultural peculiarities.

The main drawback of the current educational practice in Kazakhstan is presented in an artificial nature of the classroom activities, where neither the students nor the teacher are native speakers of the target language, not mentioning the target culture natives. That is why bringing communicative activities with other speakers of English worldwide into the educational process can become beneficial for students, especially in terms of readiness to meet the real requirements of daily communication.

Taking the previously mentioned aspects into consideration, **the actuality of the research** is determined on the one hand by the significance of language learners' acquisition of social interaction skills as an important mean of cross-cultural communication; and on the other hand, by the insufficiency of the development of particular matters on the given research problem.

The **main purpose of the research** is the creation of the methodological model of teaching English through social interaction methods, which will combine together the activities to increase students' communicative competence skills, as well as their social interaction abilities, and introduce them to the strategies of cooperative learning, group discussions, group projects.

The objectives of the research are:

- 1) To give a definition to Social Interaction Method;
- 2) To define the concept of "social interaction skills";
- 3) To work out methodological model of improving students' social interaction skills of pre-intermediate level (strategies, principles, combination of activities for each of the stages of teaching);
- 4) To prove experimentally the created methodological model.

The methodological framework of our research is based on sociolinguistic and sociocultural fundamentals [L. Vygotsky, J. Piaget], linguistic theory [R.Dixon, E. Bates, D.Tannen], and the fundamentals of communicative methodology [N. Chomsky, D. Hymes, S. Kunanbayeva].

To solve these issues, we worked with both *primary and secondary research* types. Along with the study of psychological, sociolinguistic and methodological literature on the topic, we used the following scientific research methods:

- observations of pedagogical process;
- gathering information through questionnaires among students and teachers;
- the analysis of programs, reference books, teaching materials;
- experiential teaching including pre-and post-experimental sections;
- the methods of statistic processing of results.

The **Scientific novelty** of the research is:

- 1) Based on sociolinguistic and sociocultural analysis, the most common types of social interaction were identified;
- 2) Methodological model of teaching social interaction skills was created and tested through experimental teaching, based on the principles of teaching and the system of activities and exercises.

The **Theoretical value** of the research is our attempt to give definition to the terms of "social interaction skills" through analysis and synthesis of sociolinguistic and sociocultural factors.

The **Practical value** of the research lies in the fact that guidelines on the formation of specific skills of social interaction through integrating four skills of communication of learning were established, which can further be used either in practice by foreign language instructors, or for methodological textbooks.

Author's personal contribution lies in the fact that the presented methodological model was approbated and embedded in the teaching process in the period between 2011-2012.

The structure of the research work:

The scientific thesis consists of introduction, three chapters, conclusion, the list of references, and the appendix part.

In the **Introduction** part:

- the actuality of the chosen theme is justified;
- the purpose and objectives are defined;
- the hypothesis is proposed;
- the methodological framework is described;
- the scientific novelty;
- theoretical and practical values of the research;
- stages and the research procedure;

-the statements brought for the defense are specified.

In the **first chapter** "Theoretical background of teaching English using social interaction methods to learners of pre-intermediate level" the notion of Social interaction skills" are given, sociolinguistic and sociocultural peculiarities of social interaction are viewed, the critical analysis of literary sources on the issue is implemented.

In the **second chapter** "The methodological model of teaching social interaction skills through social interaction methods to learners of pre-intermediate level":

- the notion of model of teaching process is generalized;
- the principles of methodological model of teaching;
- the stages in formation of social interaction skills through social interaction methods'
- and the nomenclature of skills of social interaction are published;
- the system of exercises in formation of skills of social interaction is applied.

In the **third chapter** the experimental teaching of social interaction skills to the learners of pre-intermediate level":

- the main objectives of the experimental teaching are presented;
- the characteristic of the probationers and the experimental material are given;
- the course of the experimental teaching is described;
- the analysis of the results is carried out.

In the **Conclusion** the results of the research are summarized.

The findings of the paper are drawn from the main conclusions from the theoretical part of the research paper, containing the close analysis of the current situation and the importance of developing students' social interaction skills. The importance of social interaction in the modern life situations is apparent. It is commonly believed that if an individual wants to be competent, social interaction skills has to be a part of every aspect of social life, such as activities, studies, or work.

Social interaction skills are abilities that facilitate the development of meaningful relationships and friendships and help students to cope effectively and adaptively with the demands of their social environment.

The Social Interaction Method is an instructional method used by teachers in the classroom to facilitate group work. It is a student centered teaching approach that allows students to interact with each other in a structured on task manner. In this strategy, students take on the role as a facilitator of content by helping their peers construct meaning. The students are allowed to question, reflect, reconsider, get help and support, and participate in group discussion. The stages of instruction using the social interaction models begin with an introduction lead by the instructor. The learners than break into groups, and the instructor continues to monitor and assess teams and their work. Finally, the teams conclude with their results or findings. It does not study only about learners' behaviors, but also deals with education implications for communication in the classroom.

Now we will thoroughly discuss about previously mentioned suggestion by Canale, that communicative competence includes four components: grammatical competence (knowledge of the language code); sociolinguistic competence (knowledge of the sociocultural rules of use in a particular context); strategic competence (knowledge of how to use communication strategies to handle breakdowns in communication) and discourse competence (knowledge of achieving coherence and cohesion in a spoken or written text).

We will focus on each components of communicative competence, starting from **grammatical competence**. It is the ability to understand and produce the distinctive grammatical structures of a language and to use them correctly in communication. Grammatical competence is the primary focus of study in most academic language courses. Most scholars agree that there is some kind of fundamental difference between being able to use the forms of the language and

being able to talk about the forms of the language: the relationship between those two kinds of knowledge is a controversial topic.

M. Canale introduced grammatical competence as the mastery of the linguistic code of lexis (vocabulary and semantics); phonetics (pronunciation and prosody); morphology (word function and inflection); syntax (structure of language). This kind of competence gives students the opportunity to understand and apply literal meaning of utterances appropriately in communication context. Each linguistic code is forwarded to communicate well in the target language, to produce utterances correctly in the form of vocabulary- knowledge of wide range of words, how and where it is used, how it is pronounced, how is it used in the sentences. Knowledge of grammar helps students to communicate accurately, using the correct forms grammatical structures.

Katz and Fodor suggests that a grammar should be thought of as a system of rules relating the externalized form of the sentences of a language to their meanings that are to be expressed in a universal semantic representation, just as sounds are expressed in a universal semantic representation. Development of social interaction skills demands learners to possess with linguistic competence, as well as grammar knowledge to construct sentences correctly in cross-cultural communication. If one delivers his ideas ignoring grammar rules and structures the whole content of his message will be destroyed, because it will be difficult for the receiver to understand the meaning of the idea.

Socio-linguistic competence is the ability to interpret the social meaning of the choice of linguistic varieties and to use language with the appropriate social meaning for the communication situation. It is the study of the relation between language and society--a branch of both linguistics and sociology.

Sociolinguistic competence is the ability to use language appropriately in different contexts. It is our sociolinguistic competence that allows us to be polite according to the situation we are in and to be able to infer the intentions of others.

Having positive sociolinguistic competence means knowing how to "give every person his or her due." It means knowing when to be quiet, and when to talk, when to give compliments to others, and when to apologize. It also means being able to read situations and know what is the right thing to say or do. There are an infinite number of combinations of roles, tasks, contexts, and feelings that govern what is appropriate in any given encounter. Good sociolinguistic skills in a second language are supreme because if you make serious mistakes in this type of competence, people will not simply think that you are ignorant (which they may think if you have poor grammar); rather, they will think that you are ill-mannered, rude, etc. If your grammar is excellent, you will be judged all the more severely for sociolinguistic gaffes.

It is obvious that sociolinguistic competence offers more insights in learning a language. Problems may arise for students' who may not be familiar with the various context of language use. By means of getting acquainted with the various cultures of English and updating their knowledge about language learning, students may be better able to accomplish the goals of engaging themselves in the pragmatic, authentic, functional use of language for meaningful purpose.

Discourse Competence can be seen as the ability to understand and express oneself in a given language with the appropriate cohesion, coherence and rhetorical organization to combine ideas.

Experts point out that there are different varieties of discourse competence that measure different aspects of communication. One kind of competence in discourse is often called **textual competence**. This is basically a measure of how well an individual can read different texts and understand them. Different kinds of text include fiction and nonfiction, narratives, instructional guides, and other types of written communications, like transcriptions of recorded conversations

or technical materials. The better readers can understand these texts, the more textual discourse competence they have. Another very common type of competence related to discourse is *rhetorical or effective discourse competence*. This is often defined as how well an individual can contribute to a conversation. This kind of discourse ability, or competence, also includes multiple components. One is how well the individual can understand what is being said by a range of speakers. Another is how well the individual can interject his or her own views, and how well that person can express ideas to an audience within a general scenario.

Canale and Swain initially viewed discourse competence as part of sociolinguistic competence, which was believed to be composed of both socio-cultural rules of use and rules of discourse, Canale's revised definition of discourse competence views it as an element entirely independent from sociolinguistic competence, comprising "mastery of how to combine grammatical forms and meanings to achieve a unified spoken or written text in different genres". Its distinction from sociolinguistic competence, however, generates some controversies. It could be claimed that "unity of text involves appropriateness and depends on contextual factors such as status of the participants, purpose of interaction, and norms or conventions of interaction". Discourse competence then could still interfere with the conception of sociolinguistic competence. After all, both components involve interaction in specific politeness modes and, therefore, will often call on the same communicative instruments.

Strategic Competence is the ability to compensate for lack of capability in any of the other areas. There are some strategies that include paraphrasing, repetition, guessing, changes of register and style, etc.

Canale pointed out that this competence can also be used to enhance the effectiveness of communication. In a qualitative sense, it is different from the other three components of communicative competence in that it is not a type of stored knowledge and it includes non-cognitive aspects such as self-confidence, readiness to take risks etc. However, since it interacts with other components, it enables learners to deal successfully with a lack of competence in one of the fields of competence.

The development of learners' communicative competence is connected with expression, interpretation, and negotiation of meaning involving interaction between two or more persons or between one person and a written or oral text.

We use language for different communicational purposes, to express our minds, not only information but also our feelings, thoughts and ideas, to fulfill our desires and intentions, to establish relationship with other people, in short, to maintain interaction in a society. In order to increase these social interaction skills, we should increase communicative competence in terms of speech.

The main goal of our research was to create the methodological model of teaching students' social interaction, which will combine together the activities to develop students' communicative competence skills. Through analysis of literary sources presented by different linguists and instructors, we described the advantages that social interaction can bring to the learning process.

Among the advantages of social interaction as a mean of teaching a foreign language we can list the following: promotion of Communication Competence, encouragement of social interaction skills, problem solving abilities, development of motivation and self-confidence. While all of the points above are considered crucial, the place of communicative competence in the process of language learning is fairly exceptional, as the development of intercultural communicative competence is considered to be the main objective of any foreign language teaching. As we observed the works of various linguists, both local and foreign, concerning our topic, we analyzed the ways in which Communicative Competence is developed through social interaction. Those ways include: promoting socio-cultural, grammatical, strategic, and discourse

competences, which in return make the foundation of Communicative Competence, as it was described in the model presented by M. Canale and M. Swain.

In order to understand of the learners' experiences with social interaction and general attitudes towards our topic, we conducted opinion surveys among them, asking them to answer for the following questions:

1. Do you enjoy working with other students in groups? Why/Why not?
2. Do you feel anxiety or stress while working with other students?

The results showed that the students are really enjoy working with other students in groups and tasks for social interaction are interesting for them. Only few students answered that they feel fear or anxiety while working with others. The data collected from this survey gave the direction for the development of the methodological model of teaching social interaction. The purpose of the experimental part of the research is to examine the notion of the presented methodological model.

Before starting with the designing of the model of teaching social interaction, we came up with the following principles, upon which later on based our model:

1. The principle of conversational analysis of social interaction method
2. The principle of integrating four teaching skills of ESL students
3. The principle of communicativeness
4. The principle of problem solving

Based on these principles we worked out the methodological model of teaching social interaction to aid learners to improve their social interaction skills. The model consists of three stages: Presentation, Practice, Production, each of which had their particular characteristics and a system of activities with a list of developed skills.

Presentation stage was designed in order to prepare students for the interaction process. At this stage the teacher explains the objectives of a task, maintaining interaction in a class. A wide variety of activities are used in order to improve the social interaction skills of students.

Practice stage was designed in order to develop the social interaction skills. At this stage the interaction is more increased and students will learn to work with other learners, sharing ideas and opinions.

Production stage is a productive stage, where students are required to produce their outcomes. Collaborative activities are provided in order to achieve a common goal.

The methodological model was tested experimentally, and proved itself to be an effective mean of teaching social interaction. The level of the students of the experimental group was determined as Pre-intermediate using a placement test. The experimental part of the work took place during the first semester of academic year at the SDC, among freshman students. The total number of students participating in the research was of students participating in the research was 38 (control group-20 students, experimental group -18 students). The experimental part consisted of three stages: Pre-experimental stage, Experimental teaching stage, and Post-experimental stage.

Pre-experimental stage included the placement test, and pre-experimental task given to two groups (experimental group and control group). The task was to prepare a group project about tourism on the topic "*Interesting Places to Visit*". The highest score for the task is 100 points, with 5 criteria by 20 points each. The criteria for assessment of group project work are the following:

1. *Content*: this criterion deals with the content's accuracy and accomplishment of a task;
2. *Social Interaction*: this criterion evaluates joint attention and social reciprocity; offers help to others and respects other students' opinions;
3. *Contribution*: this kind of criterion tests the students' participation, effort and involvement in a task;
4. *Organisation*: this criterion deals with logical order of events, clarity of ideas;

5. *Mechanics/conventions*: this criterion tests students' grammar, vocabulary, word choice, spelling, pronunciation mistakes.

The evaluation was carried out using rubrics, as it is considered to be the most objective mean of assessment when it comes to interaction tasks. Before starting with the evaluation, the rubrics were tested by several instructors on sample works of other students, and their feedback was taken into consideration. In order to be objective, we chose multiple graders (English language instructors from the college and the researcher) to evaluate the pre-experimental task. The grades of the students of both groups were nearly at the same level with the average of 67,37 and 65,81 for groups A and B respectively.

During the experimental teaching part we applied the methodological model that we created on the English lessons of the experimental group A, whereas the group B studied by the traditional methodology.

The results showed that the general attitude of the participants from the experimental group towards social interaction is fine, as they feel confident about social interaction, and believe the process of interaction can be enjoyable.

During the Post-experimental work, the two groups were given another group project, similar to the pre-experimental task: to prepare a group project on the following topic: "*An Unusual Holiday*". The works of the two groups were evaluated by the same criteria, using the same rubrics. The purpose of the post-experimental work was to see how well we were able to realize the hypothesis of our research and to form social interaction skills of participants from the experimental group. As we compared the previous results with the latest results, we noticed a significant improvement in each of the criteria in case of the experimental group, whereas the results of the control group did not change significantly. The average results of the Post-experimental task were 81,3 and 67,24 for groups A and B respectively. We can see the results that the group A made a significant progress, whereas the group B remained on the same level, which can illustrate perfectly the significance of the presented methodology.

The social interaction plays a paramount role in the field of the modern world and the global market economy of our country, as the aim of the education in Kazakhstan is to develop communicative competence in people, who are able to communicate freely in English.

Based on what we have learned throughout the research, we can recommend the instructors and teachers of English language to use social interaction tasks on their lessons, as these types of activities demonstrated to be highly crucial for the learners, and can make the lessons more interesting and involving. However, the presented methodology was mostly based on the Pre-intermediate level, it does not have to be limited and can be adapted for students of lower or higher levels of English proficiency. There is no need to apply all of the activities, but to choose those of them that correspond to the students' levels and needs. The further research in the field can expand the activities and the range of skills developed.

In general, we can draw a conclusion that the results of the research were very good, as we showed the effectiveness of the presented methodology by conducting the experimental work and analyzing the results. We believe that the research that we undertook achieved its aim, and that the findings would make a contribution to the methodology of teaching foreign languages.

In the light of the findings and conclusions of the study, the following recommendations can be suggested:

- the necessity of the shift from teacher-centered approach to student-centered learning by facilitating and guiding students;

- English language teachers should frequently use social interaction strategies, like group discussions, projects and cooperative learning in order to engage students and make the lesson more interesting and remarkable;

-foreign language teachers must develop students' oral communication skills by enhancing them sufficient time to freely interact with each other.

-teachers should establish friendly, comfortable and interactive environment that promotes interaction and helps to develop students' communicative competence skills.

Work approbation The article on the target problem entitled "Social interaction as a mean of developing communicative competence in teaching foreign language" was presented and discussed during the annual scientific International Conference Building Cultural Bridges held in Suleyman Demirel University, April 27-28, 2012. The article on the target problem entitled "Development of students' social interaction skills in ELT" was published at the "ICBCB Conference Book" magazine (Volume IV (10)), Almaty, 2012.

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FORMATION OF PHONETIC SKILLS OF STUDENTS AT THE INITIAL STAGE OF EDUCATION

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Abstract

We often under-define and understand how to speak beautifully and effectively. Good speech is thought to be the way an announcer or a theater artist plays the text or thought given to him by adhering to intonation, emphasis and similar rules. However, this is only one aspect of a beautiful and effective speech. The expression of only pleasant-sounding feelings and wishes is only a part of the speech, not the whole. Good speech is the ability to express one's feelings, wishes and thoughts effectively, even if it is not planned beforehand. For this reason, just like reading, speaking well can be defined as a skill, habit, skill and art that is formed by the work of many organs in our body, starting from the brain, in harmony with each other. What is the secret of this business? There are such people; When they talk, you think that even the air you breathe is thanks to them. Their speeches are so effective that in every environment they are in, they manage to make people in a circle around them in a short time and they have an enviable influence on their environment.

Keywords: phonetic, language, skill, student, education

In the light of the reforms of modern language education, one of the priority areas is teaching pronunciation.

Teaching pronunciation is of great importance, since its effectiveness largely determines success in mastering oral speech. It is known that large deviations from the norms of pronunciation lead to misunderstanding of the speech of the interlocutor, cause violations of the process of oral exchange of thoughts. One of the most important conditions for communication is the development of auditory-pronunciation skills, that is, the ability to correctly associate an audible sound with its corresponding value and produce sounds corresponding to certain values.

Phonetics deals with the sound material of human speech. Phonetics studies the sound composition, sound structure and sound changes in the language and the patterns of these changes (Greek phone - voice, Greek phonotike - related to voice, to sounds).

Phonetics, as a branch of linguistics, studies the sounds of speech that are pronounced by a person and audible by a person. In the sound composition of each language, phonemes are distinguished - the main units of the sound system - and their varieties. Phonetics is the study of both.

An analysis of domestic and foreign methodological literature shows that there are two approaches to teaching pronunciation:

- 1) imitative;
- 2) analytical and imitative.[1]

The process of developing a pronunciation skill goes through several stages:

1. Perception - the creation of the correct sound (auditory) image;
2. Differentiation - understanding, distinguishing the signs of sound;

3. Imitation - fixing the speech-motor images of a speech unit;
4. Isolated reproduction - fixing articulation based on the use of the pronunciation phenomenon;
5. Combination - switching attention from one phonetic phenomenon. [3]

Sound matter is the primary element of speech, and hearing and pronunciation skills underlie all types of speech activity. Therefore, work on the pronunciation of students begins with the first lessons of the initial stage, and further extends to the entire school course of teaching a foreign language.

At the initial stage, the formation of the auditory-pronunciation base takes place; at subsequent stages, it should be strengthened, that is, each stage has its own responsible task in relation to teaching pronunciation. And here we must keep in mind the following: if at the initial stage something is missed and wrong pronunciation habits arise, then it is very difficult to correct them later.

Consider the features of the formation of phonetic skills at the initial stage of training.

One of the most important ways of getting acquainted with a phonetic phenomenon at the initial stage is to show a visual, somewhat exaggerated demonstration of its features in a sounding text. The sequence of presentation of phonetic material is dictated by its needs for communication. Therefore, from the first steps, it is sometimes necessary to introduce sounds that are the most difficult, which have no analogue in the native language.

In teaching pronunciation, the analytical-imitative method has justified itself, in which sounds subject to special training are isolated from a coherent whole and explained on the basis of an articulatory rule; this is the analytical part of the work. Then these sounds are again included in the whole, which is organized gradually: syllables, words, phrases, phrases, and are pronounced by students after the sample, imitated. Articulation rules are approximate (close to correct) in nature. These are actually rules-instructions that tell students which organs of speech (lips, tongue) are involved in pronouncing the sound. For example, to pronounce the English sound [w], you need to round your lips and push them forward a little, pronouncing the Azerbaijani “y”.

When getting acquainted with phonetic phenomena, the explanation must necessarily be interspersed with a demonstration of the standards that students hear from the teacher or in a sound recording in order to create conditions under which students seem to “bath” in sounds at the moment when their articulation is explained to them. This is followed by intensive training of students in pronunciation, which again takes place on the basis of standards. The training includes two types of exercises: active listening to the pattern and conscious imitation. Active listening (“listening”) is guaranteed by preliminary tasks that help draw attention to the desired quality of sound, intonation; it stimulates the selection from the stream of words of a particular sound to be mastered. By raising a hand or a signal card, the student shows the teacher how he recognized the sound. Simple imitation without awareness of the features of a foreign language sound is considered insufficiently effective, since students tend to perceive foreign sounds through the prism of the pronunciation base of their native language.

Conducting the teacher contributes to the improvement of the quality of conscious imitation. At the same time, students should be taught certain symbolism of gestures so that they can “read” them. Longitude is represented by a horizontal movement of the hand, brevity - by a quick arcuate. Conducting is especially important when teaching intonation: the stress is demonstrated by an energetic wave of the hand from top to bottom, the rise in tone corresponds to a smooth movement of the hand up, its decrease - down.

Conducting a teacher is an important visual support for students at the stage of formation of auditory-pronunciation and rhythmic-intonation skills.

Let's take simulation exercises as an example; awareness of imitation is guaranteed by indicating what you need to pay attention to:

- Say sounds after me, paying attention to longitude (shortness);
- Say the words paying attention to the stress;
- Say sentences paying attention to the melody;
- Say sentences paying attention to pauses.

The subject of training exercises are, as we see, sounds and sound combinations placed in ever larger units: from a syllable - through a word - to a phrase and to a text. Work on pronunciation in this case goes from listening to the text spoken by the teacher to the text created by the students.

Also, at the initial stage, it is peculiar to use such methods: performing phonetic charging; development of the phonetic side of the new lexical and grammatical material; work on pronunciation by reading aloud.

Phonetic exercise is also the main way to form pronunciation skills and is a special pronunciation training exercise that prevents forgetting phonetic material and prevents deautomatization of skills. Several goals should not be associated with phonetic exercises, as is often the case in practice, when the teacher includes grammatical and lexical phenomena in phonetic exercises for repetition. The attention of students is scattered, and this affects the thoroughness of working out the phonetic side. [2] Of course, the lexico-grammatical material is somehow included in the phonetic exercise, but only its phonetic side should be emphasized. For example: "Let's repeat the main forms of strong conjugation verbs, paying attention to the quality of the root vowel" or "Repeat words that mean a profession, paying attention to their stress" and so on.

The material of phonetic charging can be individual sounds, sound combinations, words, sentences and small texts containing phonetic phenomena that need constant "inventory". Usually, phonetic charging is built in a graduated way: from smaller units (the subject of training) to larger ones, where these units appear in various combinations. For example, in English: [w] - what, water, wind, why, and then rhyme: Why do you cry Willy why?

It is important to find out the place of phonetic charging in the lesson. It is often performed at the beginning of the lesson, introducing students to its atmosphere, neutralizing the influence of the sound environment in their native language. It is possible, however, to carry it out immediately before exercises in oral speech or reading as a phonetic exercise, causing "vigilance" to the pronunciation of vocabulary units that will then be used in speech. Phonetic charging may precede reading, then it occurs on the material of the text for reading, from which phonetic difficulties are singled out, grouped accordingly and then offered to students for conscious imitation. The improvement of pronunciation skills also occurs in connection with the work on new vocabulary and grammatical material. Introducing students to new lexico-grammatical phenomena, one should not lose sight of the pronunciation difficulties contained in them. As a result, any portion of words and grammatical phenomena can become an occasion for improving pronunciation skills at an advanced ethane. It is important to emphasize the following: the teacher should not again explain the articulation and rhythmic-intonation rules, the main thing is to encourage students to remember the rule and bring a new language unit under it. The effectiveness of this approach also lies in the fact that it involves the assimilation of the new in close connection with the old, the constant updating of all learned material.

Working on reading aloud at the initial stage also provides an opportunity to strengthen the phonetic base of students. One should not, however, encourage students to read aloud without phonetic exercises; the analytical and simulation stage is obligatory.

The work on the formation of phonetic skills of students at the initial stage of education allowed us to conclude that the process of forming phonetic skills will proceed more successfully if the methods of forming phonetic skills are correctly selected; age characteristics of children are taken into account; the algorithm for the formation of phonetic skills is observed.

An intensive process of mastering the norms of the language occurs mainly in preschool and primary school age. Hence, it is the role of the school that is important in the formation and development of the skills of correct oral speech.

A preschool child perceives and reproduces only one form of speech - oral, while his pronunciation is always compared with the pronunciation of adults. With admission to school, the process of mastering pronunciation by children continues under the significant influence of writing on it. At school, children begin to master two completely new types of speech activity for them: reading and writing, which include the visual analyzer in their work, which causes a significant restructuring of the previously established mechanisms in the auditory and speech-motor apparatuses. [4] Thus, the pronunciation skills of primary school students are formed and developed under the influence of the graphic form of the word. With the arrival of the child in school, the teacher's sounding speech becomes the main mechanism for mastering pronunciation norms.

If we look at the issue from another angle, as you know, in job interviews, the employer conducts an interview before hiring its personnel. The aim here is to try to get to know the other person to the maximum extent in a limited time. At the end of these interviews, sometimes you look at someone with much less qualifications than you, you lost the job you wanted so much, even the person you like... "What is the secret of this job?" If you say, this answer is very clear; to be able to speak well... Because speaking is not just a straight communication tool. It is the most effective way in which a person can convey all his feelings as well as all his thoughts to his environment. Without distraction... Let's listen to Psychologist Jack Marrison Pollack for good talk: Many of us don't really listen to what others have to say, without thinking about what we're going to say. If you listen to them attentively, they will listen to you with interest. If you give the other person the opportunity to talk about what he or she is capable of, you will avoid an awkward silence and often the other person is so immersed in what they are saying that they forget the shyness that can hinder two people from speaking the most. When speaking, the smallest and unnecessary; If you explain without skipping any point, the person in front of you will get bored and distracted until you come to the main topic. Before you start speaking, stop and choose the words in your mind. Do not jump from one subject to another. When speaking, look at the face of the person you are talking to, do not mutter. By asking a question intelligently, you cause the other person to "open up". "How are things?" or "what's up?" Questions like these are unnecessary. But, "How did you get started?" or "how do you think" makes the other person talk and prevents you from speaking more than necessary. Often, it is not what you speak that matters, but how you speak. A friendly discussion enriches the conversation, but a harsh word can cause both sides to become ambitious and distance themselves from each other. If you need to enter the conversation while someone is speaking, you should use a soft sentence when interrupting the conversation. We often have to talk to people who annoy and annoy us. In such cases, make an effort to deal with the topic being discussed. To rightly praise someone is to gain his attention. The moment you learn to compliment people, your conversation becomes richer. What should you pay attention to? In oral expression, the speaker does not have a large amount of time, the opportunity to read and correct again and again. For this reason, it is more difficult to make an effective and beautiful speech duly than to write an article on the same subject. Someone who writes well may not be an equally good speaker. Although it is not an easy task to speak beautifully and effectively, it is possible to have a better and more successful speech than before, by avoiding the mistakes listed above, by examining the resources and examples related to this subject, and with a little effort and attention. If you are a speaker or listener in an environment where the act of speaking takes place, you should also pay attention to the following points. Pay attention to your interlocutor, be respectful and do not brag. This is also a requirement of self-respect. If you do not respect your interlocutor, he will not respect you. Be sincere and avoid pretentiousness. Your words and

attitudes will support each other, which will increase your credibility. First of all, what you say should be clear from what you believe. Choose a topic suitable for the place, time, situation, addressee and do not talk empty-handed. Don't say everything you think, but think and say what you say. Learn to be quiet when you have nothing to say. Do not lengthen words unnecessarily. Do not try to give advice to those around you often. If asked for your opinion, respond duly. - Pay attention to the choice of words, to say them correctly and to your style while speaking. Try to expand your vocabulary. Do not speak in a limited language, with repeated words. Try to form as strong sentences as possible. If you can't control long sentences, choose short sentences. Do not forget that the voice is an important element that reflects the personality of the person. Be careful not to reflect qualities such as absent-mindedness, tiredness, illness, cowardice, weakness, shyness, smugness into the conversation. Adjust the tone of your voice according to the characteristics of your feelings and thoughts. Do not speak in a monotonous tone, change your tone where necessary. Pay attention to the highlights. Use gestures and mimics in speech, without exaggerating, in accordance with the harmony of words and thought as necessary. When you have to give a presentation (no matter how well you know the subject), be sure to prepare. Do not cut eye contact with your audience. Do not speak at a point, place, or person, but look at all and all sides of your audience.

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Philosophical Sciences

КРИТИЧНИЙ НООАНАЛІЗ ЕПОХИ УКРАЇНСЬКИХ ГЕНІЇВ НА ПРИКЛАДІ ОСОБИСТОСТІ ПОЕТА-ПЕРЕКЛАДАЧА ГРИГОРІЯ ПОРФИРОВИЧА КОЧУРА

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1. Для кожного автора знайдеться чимало приводів узятися за перо в сподіванні створити щось особливо важливе і актуальне навіть у разі звернення до подій минувшини (включаючи й Prehistory) у разі їх вдалого використання для аналізу сьогодення і передбачення майбутнього. Безпосередніх великих поштовхів було аж два. Перший — емоційний заклик (28-06-2023) нашого Президента В. Зеленського негайно створити “Доктрину для України” задля уточнення спільних всенародних дій після сподіваної Перемоги над знівснєними рашистами, а другим виявилось чергове звернення ЗМІ усіх видів до теми “генії” у вигляді надмірного поширення критично-принижувальних висловлювань щодо природи геніальності та рис “кандидатів у справжні генії”.

З великої групи безперечних українських геніїв порівняно недавніх часів досягнення розвиненою частиною людства максимальної епістолярної вправності оберемо для цієї чергової авторської статті з широкої теми “Людинознавство” постать Григорія Порфировича Кочура (1908-1994), чий життєвий шлях має чимало подібностей до нашого. Ми народилися і провели дитячі роки у селах на нечорноземній північній частині розселення носіїв українських геніїв, де природні умови автоматично знижували середній рівень якості побуту. Ось тільки у Г.П. Кочура більша частина подальшого життя припала на наймерзєннішу частину більшовицького плану здійснення “Світової комуністичної революції”, а мені пощастило жити у “царстві Дракона” з обмеженими можливостями для реалізації глобальних намірів. Цей утвір з ознаками “супільної ракової пухлини” існував уже без сподівань на повторення геноцидів і швидку реалізацію тієї моделі планети з Серпом і Молотом, що була відтворена на Гербі Радянського Союзу.

Для досягнення проголошеної у назві статті мети ми поєднаємо виклад на основі злиття досягнєнь багатьох класичних наук, використаних в абсолютній більшості численних публікацій на вже вказані теми й описи діяльності Г.П. Кочура, і групи молодих секторів надсучасних знань про унікальні явища, що накопичуються вже в XXI ст. Перші два з цих чудоявищ (нанопотокаталізацію і бактеріальне виробництво біопластиків, які ми пропонуємо для поступової ліквідації “Світової епідемію ожиріння”) були малопомітною для всіх частиною тисяч нанотехнологій кінця XX ст. Але не для нас, заклопотаних пошуком порятунку синів і всієї світової молоді від загрози “III світової війни за рештки природних ресурсів”. Нам екологічна ідеальність цих двох процесів була помітною й очевидною.

Удосконалюючи чергові видання підручника “Основи сучасної екології”, ми наголошували на тому, що вказані процеси прийшли з майбутнього й заслуговують на назву “ноотехнології” (від словосполучення “ноосферні технології”). Вони радикально

переважають навіть смарт-технології (це трохи поліпшені індустріальні), адже надають людям потрібне і виліковують довкілля від усіх вже накопичених пошкоджень. Для швидкого ознайомлення з нашими (автора і його молодшого сина) ноопропозиціями доцільно провести в Інтернеті пошук за терміном “Nooglossary”. Ця невелика енциклопедія містить 224 легітимізованих наших ноотермінів, а от 225-м є слово “ноосфера” в тому його значенні, яке обґрунтував в своєму своєрідному “Заповіті” наш геній В.І. Вернадський (1863-1945) [1].

2. Для реалізації викладу нашого вивчення феномену Г.П. Кочура та інших українських геніїв вказаної вище практично найвищих досягнень епохи Слова і Книги на основі сучасного Ноолюдинознавства і новітніх досягнень ноонаук наведемо свої перші досягнення в “Людинознавстві” часів відсутності ноонаук.

Наприкінці існування Радянського Союзу потреби ефективного спілкування з найкращими студентами України та кілька інших обставин примусили автора активізувати моніторинг практично усіх відкриттів великого значення і технологічно-наукових досягнень. Сформувався можливість для перемоги у всесоюзному конкурсі на створення інтегрованого “Природознавства” як заміни 4-х природничих предметів для всіх тих старшокласників, хто у ЗВО планував отримувати гуманітарні спеціальності. У бурхливі 1990-ті нові знання полегшували спілкування зі студентами і давали змогу успішно захищати їх від потоків антинаукових видань, поширення старих міфів і створення нових. Ці дослідження мали наслідком велику серію важливих статей не тільки з екології і педагогіки, а й наукового людинознавства. З цієї широкої тематики зробимо акцент на тему “генії”, яка з інтервалом 10-15 років періодично актуалізується у масових і наукових ЗМІ.

Прискорений розвиток Радянського Союзу спирався на ідеологічне гасло “Пролетарії всіх країн — єднайтеся” і виробничий закон “наукової організації праці”. Слово “геній” побутувало переважно для природничо-наукової сфери, тому зазвичай сприймалося як дуже позитивна характеристики видатної особистості. Це стверджували і всі радянські педагогічні й філософські енциклопедії та словники. Наприклад, у першому томі “Педагогічної енциклопедії” 1964 року видання вказано, що геніальність є найвищим можливим рівнем обдарованості. До того ж, геній — працьовита, плідна і “суспільно важлива” особа, адже кожного разу започатковує нову епоху в царині власної творчості. Як і слід було чекати, з міркувань ідеології стаття “Геніальність” закінчується так: “Геніальна людина нерозривно пов’язана з народом, завжди виражає соціальний прогрес, чим і пояснюється колосальна ефективність генія” (Том 1, с. 488).

Розпад СРСР зумовив рух України і Росії по різних траєкторіях. У нас збереглися радянські уявлення про позитивність геніальності, а у східних сусідів крах ідеї побудови комунізму в одній окремії державі спричинив повне зникнення слів “геній” і “геніальність” у подібних виданнях. Своєрідний ренесанс настав з настанням XXI ст., коли ці терміни знову зрідка стали фігурувати у довідкових творах.

Досить суперечлива ситуація спостерігається у філософських словниках і енциклопедіях. В останньому виданні великого радянського “Філософського енциклопедичного словника” 1989 року доволі відчутний позитивний вплив періоду “перестройки и гласности” — стаття “Геніальність” порівняно велика і насичена урівноваженою науковою інформацією. Для нашого подальшого викладу особливо цінним є таке твердження: “З психологічної точки зору геній не може розглядатися як особливий тип особистості. Усі спроби виокремити особливі психологічні чи психопатологічні риси геніальності виявилися невдалими; сам творчий процес генія також принципово не відрізняється з психологічної точки зору від творчого процесу інших обдарованих осіб” (с.115). Слушно відзначено, що ще з Античності геній і геніальність оцінювалися позитивно, досягнувши піку пошани в романтичній естетиці. Наприкінці відзначено, що в XIX ст. до вивчення геніальності приєдналися психіатри.

На наш погляд, краще б вони утрималися від цього. Можливо, були психологи-науковці і до Ч. Ломброзо (1835-1909), але саме його багаторічна праця у закладах для осіб з порушенням психіки стала, мабуть, безпосереднім поштовхом до пошуків бодай мінімальних ознак психічних відхилень у поведінці і діяльності значної кількості відомих геніїв і надзвичайно талановитих осіб. Добре, що його порівняно велика і насичена багатьма прикладами і порівняннями загальновідома праця “Геніальність і божевільня: Паралель між великими людьми і божевільними”, створена ще у 1863 р., стала легкодоступною в Україні лише в 1995 році [2].

Недостатньо уважний читач легко пропустить в процесі початкового ознайомлення з книгою коротеньку фразу **“Було і є безліч геніальних людей, у яких неможливо відшукати навіть найменших ознак божевільня, за винятком деяких ненормальностей у сфері чутливості”** й отримає чималий стрес від сотень наступних сторінок, які їх автор оцінює як власне намагання якомога ґрунтовніше знищити ті “світлі та райдужні ілюзії”, які утвердилися під час оцінки не стільки особистісних рис того чи іншого генія, скільки його малярського, музичного, літературного чи якогось іншого доробку. Погодьтеся — все схоже на прояв банальних заздрощів.

У нас в ті бурхливі роки не було можливості (не стільки джерел, скільки часу) простежити достатньо детально своєрідне змагання між ідеалізованим і нігілістично-критичним баченням геніїв і геніальності. Вкажемо, що ні соціологія, ні постмодерністична філософія узагалі цим не цікавилася, концентруючись на “масах” і критиці традиційних суспільно-економічних уявлень. Набагато складніша ситуація, що відзначалася емоційним зіткненням різних поглядів, характерна для психології (як клінічної, так і педагогічної).

Багатющий матеріал для роздумів і здійснення важливих висновків надає велика за обсягом книга “Безумные грани таланта: Энциклопедия патографий” [3] (М., 2004), створена російським науковцем А.В. Шуваловим на основі значної кількості джерел, серед яких особливе місце займають багато томів часопису “Клінічний архів геніальності та обдарованості”, опублікованих у Свердловську між 1925 і 1930 роками зусиллями Г.В. Сегаліна. Досить суперечливою рисою цієї книги є спроба укладача дати власний психіатричний діагноз згаданих у ній понад 700 особистостей на основі наведеного та іншого матеріалу. З цього приводу автор “Передмови” зав. каф. психіатрії Рязанського державного медичного університету, професор С.С. Петров висловлюється таким чином:

“Психіатричний діагноз не константа, він може змінюватися в залежності не тільки від часу його створення, але й від країни, де це відбувається, і від фахівця, його ідей і пристрастей. Зрештою, немає нічого більш красномовного, як факти. Хотілося б застерегти читача від морально-етичного підходу до клінічного матеріалу. Хворий не може бути «поганим» або «гарним» залежно від свого діагнозу. Він може бути лише більш-менш «важким» або «легким». Тому не слід розглядати наявність якого-небудь одіозного розладу (наприклад, алкоголізму) як спробу «кинути тінь» на ту або іншу особистість. Якщо психіатрія є наука, то вона має повне право при всяких умовах застосовувати ці наукові дані там, де для цього є підстави, незважаючи на те, що той або інший об’єкт є улюбленцем богів або людей. Так само, як і наявність якихось патологічних змін психіки не звільняє людей влади від відповідальності за свої вчинки, якщо вони згубно відбиваються на долях інших, залежних від них людей” [3, с. 6].

Важливість щойно наведених поглядів об’єктивного науковця переоцінити важко, адже він дає нам підстави виключно критично оцінювати і праці та висновки Ч. Ломброзо, і майже всі психіатричні діагнози А.В. Шувалова щодо понад 700 геніальних чи дуже обдарованих осіб, які згадані в укладеній ним книзі “Безумные грани таланта: Энциклопедия патографий”. Слід спокійно й без особливих емоцій розглядати також досить цікаві дані, які він у табличній формі наводить в оглядовій частині (див. Таблицю 1).

Таблиця 1

Залежність провідного психопатологічного синдрому від виду творчості
(% від числа персоналій в обраній категорії обдарованості)

	Письменники й поети	Державні і політ. діячі	Художники і скульптори	Філософи і реліг. діячі	Учені й шахматисти	Композитори	Актори й акторки	Революціонери
Органічні й інші псих. розлади	7,0	11,0	18,3	6,0	14,1	13,9	10,0	0
Алкоголізм і наркоманія	25,1	7,3	6,5	1,5	3,3	11,6	3,3	0
Шизофренія й маревні розлади	12,7	12,5	26,0	33,3	15,3	11,6	10,0	15,0
Афективні розлади	18,0	20,5	18,3	10,6	31,1	30,2	16,6	17,5
Невротичні й соматформні розлади	4,6	11,9	2,8	13,6	9,8	6,9	6,6	12,5
Шизоїдний розлад особистості	3,3	0,9	5,6	6,0	13,1	6,9	3,3	0
Емоційно-нестійкий розлад особистості	5,3	6,4	4,2	1,5	1,6	4,6	13,3	5,0
Істеричний розлад особистості	7,1	6,4	0	9,1	0	4,6	16,6	5,0
Епілепсія	2,3	3,6	1,4	4,5	1,6	0	0	5,0
Усього (в абсолютних цифрах) — 706	301	111	73	66	61	43	30	21

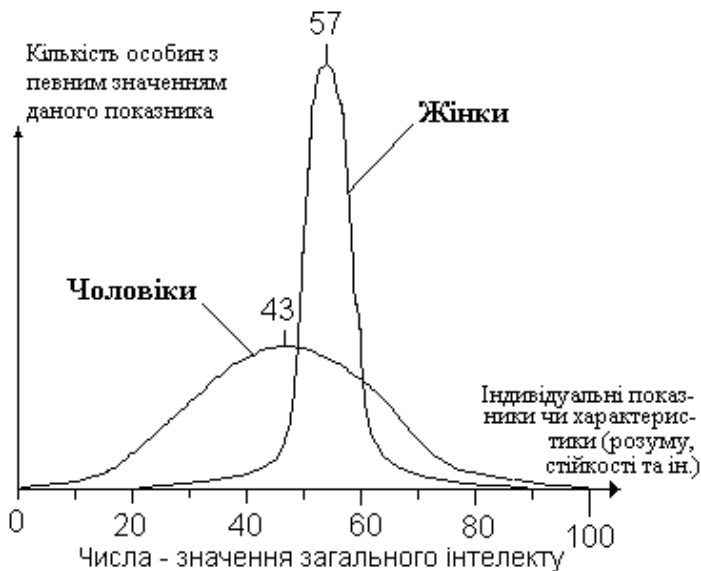
А.В. Шувалов робить застереження щодо приблизного характеру отриманих результатів з трьох причин: 1) подібна заочна діагностика досить умовна в силу своєї абсолютної залежності від наявних анамнестичних даних (з опитувань і свідчень інших людей та розповідей самого хворого); 2) досліджувана особистість могла хворіти впродовж життя на всілякі, по-різному освітлені в біографічній літературі психічні розлади, тому не завжди легко визначити серед них «основне»; 3) деяка частина персоналій не обмежувалася проявом своїх талантів тільки в одній якій-небудь царині, а сполучала, на перший погляд, досить непорівнянні: філософію й поезію, хімію й музику тощо.

Та попри все це, отримані результати вкрай цікаві тому, що виявляють домінування певних психічних розладів при різних специфічних талантах. Наприклад, шизофренія і маревні розлади частіше зустрічаються серед художників, афективність — серед композиторів, а от письменники і поети найчастіше виявляються жертвами алкоголізму і різних форм наркоманії.

Доцільно також доповнити подібні твердження А.В. Шувалова баченням геніальності та особистісних рис геніїв Е.Б. Праттом — автором статті “Геніальність” у загальновідомій “Психологічній енциклопедії” Р. Корсіні й А. Ауербаха. Він наголошує на тому, що майже сторічне дослідження багатьма психологами більшості відомих світових історичних особистостей заперечило багато сформованих уявлень про них. Найчастіше вони походили з сімей, що відзначалися високим для того часу освітнім рівнем, вирізняючись здоров’ям і стійким характером. І науковий присуд: “Не було виявлено зв’язку між геніальністю та якоюсь патологією або хворобливістю”.

Ось так: з енциклопедії про “талановитих безумців” А.В. Шувалова випливає обов’язковість якогось з численних психічних відхилень для потрапляння у групу геніїв, а з американської психологічної енциклопедії ми отримуємо практично протилежне.

Яку позицію обрати — вирішувати читачам. А ми висловимо власне ноонаукове пояснення того, чому справжні генії надмірно часто опиняються серед “осіб з відхиленнями”, серед обділених розумінням і повагою своїх сучасників. Використаємо створені на основі зарубіжних джерел графіки розподілу “загального інтелекту (GI)” чоловіків і жінок.



Графіки розподілу показників загального інтелекту для чоловіків і жінок

З наведених двох “гаусових розподілів” випливає той доволі відомий факт, що “справжня геніальність” є виразно чоловічою рисою, адже світ не знав жодної жінки, яка була б усіма визнаною як геніальний філософ, композитор чи винахідник. Досить помітні успіхи жінок у поезії, малярстві і ще кількох подібних заняттях, де вони з помірним успіхом усе ж змагаються з багатьма талановитими чоловіками.

Серед кількох можливих пояснень цих та інших фактів сучасні науки вказують не тільки мозкову асиметрію обох статей, а й відмінності у вищих біологічних завданнях (чи призначенні). Значні індивідуальні відмінності між чоловіками є непорушним законом біосфери для всіх біологічних видів, які розмножуються статевим шляхом і перебувають у нестабільному природному середовищі. Відсоток чоловіків з екстремальними відхиленнями від середнього набагато більший, як серед жінок. Причина цього у тому, що саме чоловіча стать має своїм головним завданням забезпечувати можливість не ультрарепродуктивних, а сальтаційних (стрибкоподібних) змін даного виду. Завданням жіночої статі є збереження “всього кращого” для даного виду, вища життєва стійкість і (часто) більша тривалість життя.

Подібна асиметрія завдань обох статей стала причиною значних відмінностей у кривих розподілу, подібних до вказаних на рисунку. Не випадково рекордні досягнення і в інтелектуальній діяльності, і в багатьох інших заняттях належали і будуть належати чоловікам. Рамки статті надто вузькі для детального пояснення того етологічного факту (етологія — наука про глибинні причини мислення і поведінки Ното, більша частина яких має прадавні генетичні витоки, а не персональне отримання родинно-соціумного досвіду), що представники чоловічої статі поділяються Природою на дві групи з радикально різними програмами мислення і прийняття рішень.

Абсолютна більшість чоловіків (хто має посередні показники інтелекту й емоцію ревностів) належить до групи тих, хто ще в період “підліткової кризи” автоматично гуртується в зграї й через конкуренцію формує “пірамідальну” структуру, на чолі якої опиняється активний і бойовитий альфа-підліток. Всі інші перебувають на подальших і нижчих бета-, гамма... рівнях аж широкої основи з омега-особин (на відповідному жаргоні названих “шітками”). Побіжно вкажемо на те, що індивідуальний життєвий шлях В. Путіна, якого через дію “Законів Природи” так шанує “за підняття Росії з колін” майже все доросле населення “рашки”, мав тривалу стадію не “шітки”, а “сімки”.

Мінорна частина з осіб чоловічої статі майже позбавлена ревностів і обдарована критичним мисленням та підвищеним потягом до нового й перспективного, до самоствердження через оволодіння важливими для племені знаннями та вміннями. Ця група постачає майбутніх геніїв і високих професіоналів. Історія свідчить про максимально великі досягнення тих народів, де випадково формується тандем з енергійного альфа-лідера і видатного інтелектуала (приклад — О. Македонський і Арістотель). Ми бачимо достатньо підстав для віднесення Григорія Порфировича Кочура до групи “непірамідальників”.

Немає сумнівів у тому, що геніальна особистість отримує свої видатні спроможності у дарунок від Природи (хтось може сказати — від Бога). Але для їх виявлення і розвитку вона повинна мати щастя перебувати хоча б у мінімально сприятливих умовах: у разі математичних спроможностей — серед достатньо освічених батьків і рідних, у приміщеннях з книгами чи іншими джерелами інформації. Наскільки необхідне сприятливе середовище для розвитку музичної чи малярської геніальності — загальновідомо.

Життя “справжнього генія” серед багатьох осіб, які набагато поступаються йому, досить складне і дуже рідко позбавлене серйозних проблем. Серед безлічі можливих висловлювань різних осіб про геніїв і геніальність ми обрали думку французького філософа-матеріаліста К. Гельвеція: “Геніальна людина мислить самостійно. Її погляди суперечать іноді загальноприйнятим поглядам: вона ображає марнославство більшості. Але щоб не ображати нікого, треба мати лише ті ідеї, які мають усі. У цьому випадку у вас не буде генія, але зате не буде й ворогів” [4, с. 101] .

Хоч з часу смерті К.Гельвеція пройшло два з гаком сторіччя, але ця оцінка становища генія лишається дуже точною. Інтелектуальна перевага геніальної людини над своїм оточенням цілком помітна для всіх, викликаючи у більшості зрозумілу заздрість. Легкість бачення майбутнього і висока спроможність створювати і використовувати нові поняття аж ніяк не полегшує генію трансляцію своїх думок до ровесників і старших осіб. Серед слухачів усього кілька відсотків тих, хто порівняно легко сприймає нові поняття та ідеї, намагаючись усвідомити і використати їх. Абсолютна більшість реагує не стільки вороже, як індіферентно, адже їхній головний мозок і нервова система засвідчує ефект Лачинса — відторгнення цілковито нових, несподіваних і складних для негайного використання знань

У цій ситуації геній найчастіше не припиняє свої спроби — іншого шансу для виступу може й не бути, — посилює експресивність, намагаючись переконати інших у тому, що відкрив чи придумав самостійно. На жаль, зазвичай подібні дії викликають образу всієї чи частини аудиторії, відтак — доволі агресивні контрвипади.

Ця ескалація взаємного нерозуміння відбувається аж до заключного акорду — відвертих чи прихованих звинувачень і повного розриву спілкування. Поширення інформації про даний випадок спілкування генія зі слухачами практично завжди має у ЗМІ спотворений характер, а його індивідуальність оцінюється як неврівноважена, ба, психічно хвора. Як підкреслив К. Гельвецій, “ображена більшість” залишить для історії відверто викривлений і тенденційний портрет геніальної людини. Сучасники рідко виявляють толерантність і мінімум тактовності під час своїх висловлювань про “надмірно” талановитих осіб. Не випадковими є твердження про реальні чи придумані відхилення і ненормальність — багатющий матеріал

для А.В. Шувалова та інших науковців, які недостатньо критично враховують тенденційність оцінки геніальних митців чи літераторів їхніми сучасниками.

Існує статистика (звичайно, не цілковито точна): у середньому серед мільйона новонароджених буде принаймні десять-дванадцять відзначених “іскрою божою”. У минулому не усім їм щастило реалізувати свій потенціал, про що можна лише пошкодувати. У наш час у разі хорошої роботи систем освіти відсоток реалізованих талантів досить високий. Зусилля з його подальшого підвищення виправдані тим, що суспільство мало б значний зиск з того, що кожен з цих 10-12 досягне можливих вершин свого професіоналізму і прискорить матеріальний і культурний прогрес усього людства. Для досягнення подібної мети було б корисним вибачати “справжнім геніям” їхні помилки і навіть якісь „нестандартні вчинки” (звісно — не йдеться про грубі порушення законів), підтримуючи вогник творчості і можливість створювати ніким ще не бачене і не уявлене.

3. Нагадаємо також про той незаперечний факт, що століттями віддалене спілкування йшло через листування, через мало не щоденне створення достатньо досконалих текстуальних висловлювань. У цьому процесі від одного покоління до наступного йшло “підвищення професіоналізму” в усіх аспектах створення і використання текстів.

Життя Григорія Порфировича Кочура припало саме на період вказаних вершинних “епістолярних” досягнень, тому його природний генетичний подарунок щодо пам’яті й спроможності роботи головного мозку успішно розвинувся і вдосконалився в сприятливих умовах тогочасного Київського університету в середовищі кількох геніїв (досить нагадати про А.Ю. Кримського, який залучив молодого студента до колективної наукової діяльності). Скерування на роботу на периферію (Тирасполь і Вінниця) урятувало від жахів сталінської інквізиції 1930 років у Харкові і Києві. Але вона таки “наздогнала” його у звільненій 1943 року Полтаві й запроторила в рекордний по площі концтабір в Інті й затримала аж на 15 років досягнення столичного Києва де Доля обдарувала його мало не неймовірною за обсягом допомогою Павла Тичини — коштами на придбання великого (хоч і недобудованого) будинку в Ірпені. Ця “нерухомість” стала місцем зібрань і зустрічей більшості київських та інших “шістдесятників”, а мало не світова слава геніального перекладача кращих творів з понад 30 держав якось вберігала від другого арешту і загибелі в мордовських катівнях

Не будемо наводити посилання з нагадуванням про те, що кожна національна література є справжньою частиною людинознавства. Григорій Порфирович здійснив якісні переклади найвизначніших поетичних творів на 29 мовах з 33 літератур (такими є найбільш вірогідні дані для всього його життя). Це феноменальне і безперечно геніальне досягнення, яке визнане Європою і світом. Не є випадковими його запрошення для представлення своїх та інших українських досягнень в провідні культурні центри світу в США, Польщі, Чехії (його там хотів бачити й організував мало не нескінченне спілкування “Совість і Рятівник” цієї держави — Чеслав Гавел). Лишається шкодувати, що більшу частину свого життя Г.П. Кочур не мав можливості реалізувати свої спроможності на повну потужність, і, можливо, так і не перетнув свого найвищого Акме.

Всі, хто ближче спілкувався з ним, одноголосно стверджують, що в світі своєї фахової людинознавчо-літературної інформації “він знав усе” (слова іншого українського перекладача — Максима Стріхи), успішно оперував десятками тисяч джерел — наче “Інтернет другої половини ХХ століття”.

Ці короткі абзаци-узагальнення ми наводимо для засвідчення того факту, що в інтелектуальній діяльності один Геній неодноразово легко переважав “сукупний інтелект решти Людства”. Історія розвитку мислення і діяльності людей в різних сферах свідчить про відсутність явища “ефективного додавання інтелектів” усіх членів великих колективів — повна протилежність з підсумовуванням фізичних зусиль при спорудженні каналів чи земляних курганів.

Розпочавши здійснювати власні передбачення майбутнього для захисту, рідних, близьких та всіх уважних до рятівних порад, ми виявили явище погіршення планів і прогнозів у разі збільшення залучених до цієї справи колективів. Найбільш переконливим антирекордом такого штибу, що перевершив навіть “хрущовське планування майбутнього”, ми вважаємо велику колективну французьку книгу про титанічне змагання СРСР і США уподовж усього XXI століття [5]. Книга прийшла до шокваних читачів якраз у момент повного зникнення СРСР..

4. Закінчимо статтю з наведенням свідчень власного наближення до Акме — потенційно корисних для створення згаданої раніше “Доктрини для України-Переможниці”.

З десятків відкриттів у кількох класичних науках і ноонауках (частина вказана у Вікі-статті “Корсак Костянтин Віталійович”, яку вмістила в Інтернет вдячна молодь) теми цієї праці стосується нещодавно помічене нами явище розвитку на планеті одразу трьох грандіозних меганоореволуцій. Їх врахування вважаємо пріоритетно важливим не тільки для стратегічного управління збройним опором навалі “рашистів”, а й для безпомилкового планування майбутнього та швидкої й “малозатратної” побудови України-Переможниці.

Для прискорення пояснень наведемо рис. 1, який разом з сином винайшли для зміцнення психологічної стійкості всіх співгромадян на основі точних нооданих про минуле, сьогодення і майбутнє. Наші студенти дружно підтвердили ефективність цього засобу.

Як ми вже відзначили на початку статті, з моменту надходження нового століття йде заміна шкідливих виробництв рятівними і “еколікувальними” ноотехнологіями. Саме цю радикальну зміну всіх засад життєзабезпечення людства ми пропонуємо називати **меганоореволуцією №1**. На практиці сподіваємося на законодавчу заборону всіх деструктивних виробництв, стимулювання розвитку ноонаук і максимально активне використання **ноотехнологій** (для англомовного світу корисна тотожність **nootechologies** = **wisetechnologies**). Якщо рятівних процесів, як вказано на рис. 1, в 2010 році було ледь чотири, то з весни 2019 року їх кількість зростає по експоненті і в даний момент у нашому переліку (а ми, очевидно, знаємо не всі) їх понад 40.

Наголошуємо на тому, що разом з сином **ідеї і факти з рис. 1 ми вважаємо найціннішим з усього того, що можемо дарувати не тільки студентам, а й усім співвітчизникам та восьми мільярдам Ното**, які загалом перебувають у страху перед майбутнім. Вже 22 роки ми силкуємося поширювати в наукових та інших виданнях своє найбільше відкриття — **ноотехнології і ноонауки**, але невдало. Ми повторюємо долю винахідника екології та екологічних наук Е. Геккеля, чю пропозицію усвідомили і використали мало не через півстоліття після його смерті.

Психозахист-2023 громадян України на основі ноофактів про минуле і майбутнє

Мегачинниками впливу на всіх Ното є невідомі для ЗМІ ноореволюції №1 і №2, до яких приєдналась №3

№1 полягає в заміні екодеструктивних наявних виробництв ноотехнологіями, що надають людям потрібне і лікують довкілля (пошук - по Nooglossary)

№2 менш помітна і полягає у створенні правдивої картини всієї еволюції на основі ізотопного та іншого датування і секвенування органічної складової музейних і нових артефактів. Вже довела, що Доля (чи Бог?) доручила носіям українських генів рятувати людство

№3 найстарша і стосується Штучного інтелекту. Вона різко прискорила восени 2022 року і йде на допомогу ноореволюціям №1 і №2

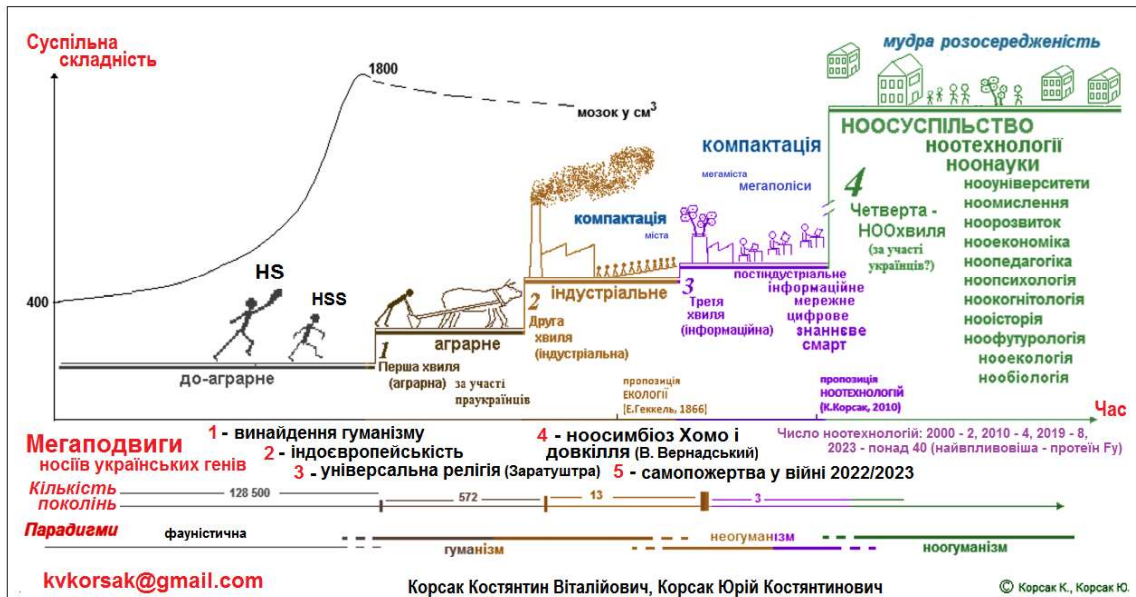


Рис. 1. Детальна схема всієї соціальної еволюції людства на основі досягнень класичних і ноонаук

P.S. Хотимо попередити всіх про те, що на Заході з певних причин ще півстоліття тому вирішили заборонити всі слова з літерами "ноо" у виданнях зі світу Sciences&Arts за єдиним винятком. Цей виняток - термін "ноосфера", що означає уявну "шарденівську" навколоземну спірит-оболонку, яку формують взаємопов'язані думки мільярдів Ното. Тому ноореволюція рухається з України і від нас у черговий раз залежить все майбутнє людства.

Причина неуспіхів у поширенні нооідей полягає в тому, що ми називаємо «найбільшою інтелектуальною помилку Заходу» наших часів. Ще в 1960-1970 роках науковці Заходу вирішили у виданнях Sciences&Arts ніколи не використовувати терміни з літерами «ноо» (виняток — «ноосфера» як шарденівська spirit-оболонка Землі). Це дуже погано для всіх, адже Захід ігнорує (приклад — Давос-2022, Давос-2023, рішення-2022 групи G20, старі й нові документи ООН) всі бактеріальні й інші ноотехнології. Навіть рятівний *протеїн Фу*, що знищить білковий голод на Землі разом з усім індустріальним тваринництвом. Але ми переконані в близькій концентрації уваги на ноопроцесах і в тому, що *ноореволюція №1* має хороші шанси на швидкий і позитивний розвиток. Тому продовжуємо робити відкриття і публікувати пропозиції засобів лікування біосфери (включаючи шлях до поступової ліквідації тотальної і багатопланової «global obesity epidemic» [6]).

Незрівнянно складніша справа з молодшою (з 2010 р.) *меганоореволюцією №2* в усій сфері гуманітарних наук та уявлень про людину та її мислення. Вона полягає у відмові від майже всього, що з часів появи писемності накопичено в історичних науках разом з науками про людину, її психологію, мислення і закони прийняття рішень. На практиці це означає створення нового океану уявлень про минуле, що спирається на новітні засоби ізотопного та іншого вимірювання віку артефактів та розшифрування (секвенування) ДНК їх біологічної складової. Коротко цю молодшу сферу знань доцільно назвати *нооісторією*.

Фактів стає все більше, а тому виникла потреба створення правдивої картини минулого, зокрема, появи і взаємодії племен, народів, етносів. Провідний генетик планети Девід Райх зі США наголосив на тому, що «Наше розуміння цих взаємозв'язків найближчими роками стане проблемою, що ґрунтується на більш ретельному аналізі даних та погляді на них з нових точок зору. Ми робимо кілька кроків назад і розуміємо, що ключові події та стосунки суттєво відрізняються від моделі першого проходу (**першого наближення), яку ми

спільно розробили. *Модель, у створенні якої я брав участь, хитається* (**акцентовано нами). Я знаходжу це захоплюючим і дестабілізуючим. І я хотів би взяти участь у спробі з'ясувати правду» [7].

На його основі наприкінці 2021 р. ми здійснити відкриття-2 (відкриттям №1 ми вважаємо ноотехнології і ноонауки, описи яких, нагадуємо, надасть Google через пошук по слову «Nooglossary»). Це відкриття являє собою підтверджену фактами теорію участі генетичних пращурів українців у 4-х глобальних мегаподвигах, що детермінували прогрес людства упродовж останніх 15 000 років.

Мегаподвиг-1 являє собою перехід від канібалізму до гуманізму, здійснений носіями українських генів (точніше — пращурами українців, поляків і первинних європейських «фермерів»). Це сталося в Східній Анатолії. Спершу вони винайшли новий світогляд як основу праукраїнського гуманістичного архетипу, виховали на його основі нові покоління молоді, успішно одомашнили рослини і дрібні копитні, втілили у життя аграрне життєзабезпечення (детальний опис — у статтях [8; 9]).

Але напади агресивних сусідів та інші причини зумовили еміграцію на Захід і Північ з появою землеробства в Європі. Наші пращури обрали чорноземи України, поєдналися генами з мисливцями-аріями (носіями чоловічої гаплогрупи R1a), створили феноменальну трипільську культуру, здійснили багато винаходів, що стали витоків індоєвропейської мовної родини і відповідної культури (**мегаподвиг-2**). На Сході створеного ними Великого Трипілля у сільці Синташта пращур на ім'я Заратуштра винайшов першу універсальну релігію — зороастризм (**мегаподвиг-3**). Вона існує й зараз, але кількісно поступається іншим світовим монотеїстичним релігіям, які зростали саме з ідей зороастризму.

У ті часи на Захід Європи прибули агресивні носії гаплогрупи R1b. Вони ліквідували «фермерів» (занепад їх генів першим виявив Д. Райх) разом з усім їх гуманізмом й надалі керувалися протилежним до гуманістичного «атлантичним архетипом». Спробували винищити ще й слов'ян, але у битві на річечці Толлензе (справжня назва — Dołęża) 3250 років тому зазнали такого фіаско, що нові напади на Схід поновилися аж через 2000 років. Нам важливо вказати на той незаперечний факт, що меридіан Берліна став межею поділу Європи на зони двох архетипів, що зберігається й зараз.

Наближаючись до закінчення і висновків, відзначимо факт активного «змагання» в західному інформаційному просторі відвертих українофобів і чесних дослідників. Кілька років тому згадане вище досягнення Д. Райха щодо занепаду генів «первинних» європейських землеробів українофоби оголосили незаперечним доказом давнього геноцидного нападу «українських степовиків-ямників» на всі західні землі. А от чесні науковці відшукали докази того, що **«геноцидниками» виявилися давні пращури сучасних західноєвропейців**, які мали чоловічу гаплогрупу R1b. Вони притримувалися в мисленні і діях засад атлантичного архетипу й увійшли в історію безперервними війнами, створенням імперій і колоній, а також найбільшим своїм культурно-цивілізаційним антидосягненням — публічним спалюванням найгарніших і найрозумніших жінок на великих міських площах. Доцільно вказати на те, що останнім «винаходом» українофобів стали статті, в яких безприкладно гігантську для тих часів західну армію в Толлензе-битві називають «мирним караваном», організованим для торгівлі з лужичанами...

Та повернемося до головної мети статті й прогнозів майбутнього. З відомих нам праць попередників виокремимо все здійснене В.І. Вернадським у роки його перебування в Парижі, що навіть зараз лишається маловідомим і практично неусвідомленим в Україні та інших экс-радянських державах. Його науково-прогностичні досягнення початку 1920-х років пропонуємо назвати **мегаподвигом-4**, адже він першим створив правильну (гідридну — переважно водневу) модель Землі, пояснив багато «загадкових» природних процесів, передбачив наростання загроз для людства і запропонував рятуватися через появу в нього

спроможності забезпечувати себе їжею й іншими продуктами без пошкодження біосфери [10]. Очевидно, що меганоореволюція №1 є процесом втілення його рекомендацій у життя.

Закінчимо цю порівняно довгу статтю вказівкою на те, що ефективну і по-справжньому стратегічну “Доктрину для України-Переможниці” необхідно створювати на основі врахування майбутніх перспектив двох меганоореволюцій і того, що третя перетворить Штучний інтелект в засіб могутньої підтримки перших двох.

У тисячолітній період існування й різноманітного впливу Великого Трипілля наші пращури мимоволі здійснили “перше одуховлення людства” на основі праукраїнського гуманізму й поширення найвищих тогочасних технологій. Саме зараз йде процес поширення з наших теренів інформації про ноонауку і ноотехнології.

Отже, ми маємо підстави вважати, що ще одне “поліпшення людства” буде його **ноодуховленням** і гарантією довготривалого ноосимбіозу людей і вилікуваної біосфери, яке свого часу у щойно згаданій статті запропонував наш геній у точних науках та уявленнях про Землю і людство В.І. Вернадський.

З викладеного вище та всього відомого іншого робимо висновок про позитивну есхатологічну позицію всіх згаданих (В.І. Вернадського, Г.П. Кочура, А.Ю. Кримського) та інших видатних захисників свого народу, здійснення ними надзусиль для перетворення своєї чудової мрії в дійсність.

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SYNTHESIS AND STUDY OF GRAPHENE AND ITS DERIVATIVES FROM SOLID COMBUSTIBLE FOSSILS

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Annotation. Graphene, a two-dimensional form of carbon, has attracted immense attention from scientists and engineers around the world due to its unrivaled physical and chemical properties. The first and main problem faced by the scientific community so far has been the synthesis of graphene over a large area. Thus, in view of feasibility and applicability, many research groups have made efforts to obtain the best quality graphene through a variety of techniques, including mechanical exfoliation, chemical vapor deposition (CVD), and epitaxial growth. So far, CVD has certainly provided the best quality graphene that can be industrially accepted. However, other methods have been tested, some of which are also new and promising. Here we present an overview of the synthesis of graphene and their derivatives using solid carbon sources, in particular fossil fuels.

Keywords: coal, graphene, graphene nanosheets, CNT.

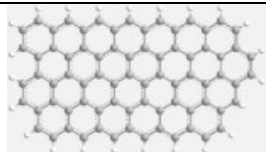
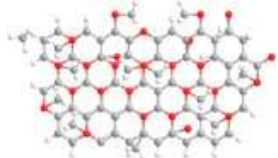
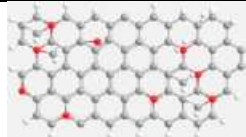
Introduction. In recent years, many advanced materials have been discovered and which have arisen huge research interests. Among them, silicon carbide (SiC), silicon carbide nano-wires (SiCnw), carbon nano-tube (CNT), and graphene are currently the most intensely-researched materials. Research on graphene, a one-atom-thick material, has been an intense area of research since the late 20th century, especially after the discoverers of graphene were awarded the Nobel Prize in 2010. Graphene has good physical properties including strength, electrical conductivity, and thermal conductivity. It also has stable chemical properties. Its specific surface area could reach 2,630 m²/g. A vivid example to describe these values is a high quality graphene “hammock” of 1 m² surface area that weighs 0.77 mg only and, which ideally can be able to hold a 4 kg cat. Theoretically, graphene is the “strongest” material that has been discovered so far and has been applied to material enhancement to some extent [1].

Graphene is a 2D single atom thick sp² bonded carbon atom. Its microstructure is based on the benzene-ring. Graphite, the most commonly available carbon material in a laboratory, could be treated as an accumulation of huge amounts of single-atom thick and multi-atom thick graphene.

Graphene can be treated as a general term for a family of materials. The most commonly used graphene types are pristine graphene (G), graphene oxide (GO) and reduced graphene oxide

(rGO). Table 1 compares their differences approximately. Pristine graphene, as its name suggests, has the best and closest properties to 'pure graphene'. It is a mixture of a single layer (majority) to multilayer graphene. Its structure is shown in Table 1, in which the gray atoms represent carbon. Graphene oxide is exfoliated from graphite oxide and usually dispersed in water, its manufacture still follows the Hummer's method which was first applied in the 19th century. As shown in Table 1, its micro-structure contains a large number of oxygen atoms (shown in red in Table 1), which typically appears in the hydroxyl ion. By removing the majority of the oxygen containing functional groups from GO, reduced graphene oxide can be obtained. Its micro-structure still contains a small amount of oxygen but its property is close to pristine graphene. It is the most commonly used graphene family material in research and applications.

Table 1 - Comparison of commonly used graphene

	Structure	Difficulties of manufacture	Properties
Pristine Graphene		High, normally small-scale and small size	Best
Graphene Oxide		Low, normally in water dispersionии	Can be used as reinforcing fillers
Reduced Graphene Oxide		Medium, depends on methods	Depends on the quality; supposed to be better than GO

Large scale production of high quality graphene is one of the current bottlenecks for the application of graphene. The methods of manufacture can be divided into direct methods and indirect methods. Direct methods produce pristine graphene while indirect methods produce rGO, which is the commercial replacement of graphene in applications, via the reduction of GO. The most commonly used methods for graphene manufacture include exfoliation, epitaxial growth on SiC, chemical growth (CVD method) and reduction from graphene oxide. More methods can be seen in Figure 1 [1, 2].

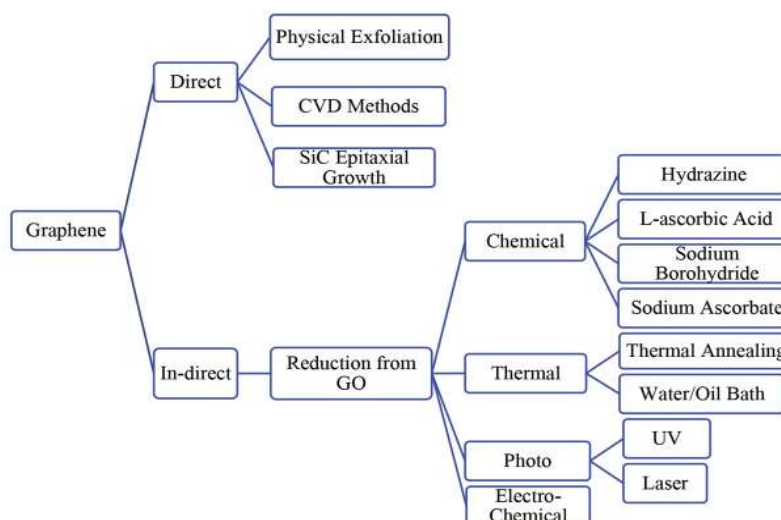


Figure 1 - Methods for making materials of the graphene family

In this study, we present a focused review of the synthesis of graphene from solid carbon sources, especially from different types of coal. The preparation process and the results of each method are also discussed.

Hao Xu and other authors [3] propose an effective method for preparing graphene nanosheets (GN) with a crystal structure by pyrolysis from coal tar pitch in the presence of aluminum, followed by etching with HCl. The preparation process was described as follows: coal tar pitch was mixed with a certain amount of aluminum powder using a mechanical stirring method. The mixture was placed in a graphite crucible with a lid, placed in an oven, degassed to remove entrained air in a high vacuum, and then heated to 1700°C and held for 1 h. The pyrolyzed product prepared from aluminum powder was dispersed with an HCl solution and stirred. The floating objects in the solution were collected and washed, and then dried in a vacuum oven.

FESEM (Field Emission Scanning Electron Microscopy) drawings of samples obtained at three different temperatures (1000°C, 1200°C and 1400°C) are shown in Figure 2 a.

The pyrolyzed product at 1000°C shows a large number of hexagonal plates and columns coated with suspension material, which can be attributed to the formation of Al_4C_3 with a hexagonal structure. The pyrolyzed product at 1200°C illustrates the morphology of layered structures covered with wrinkled structures that actually belong to graphene sheets; at the same time, hexagonal plates with a layered structure can be observed in the pyrolyzed product. The facts confirm that the obtained Al_4C_3 provides a medium for the growth of graphene sheets. The pyrolyzed product at 1400°C reveals the morphology of large cracks and fractured layered structures covered with more wrinkled structures, which may be associated with significant decomposition of Al_4C_3 at this temperature. A diagram of the proposed mechanism for the formation of GN is shown in Figure 2, b.

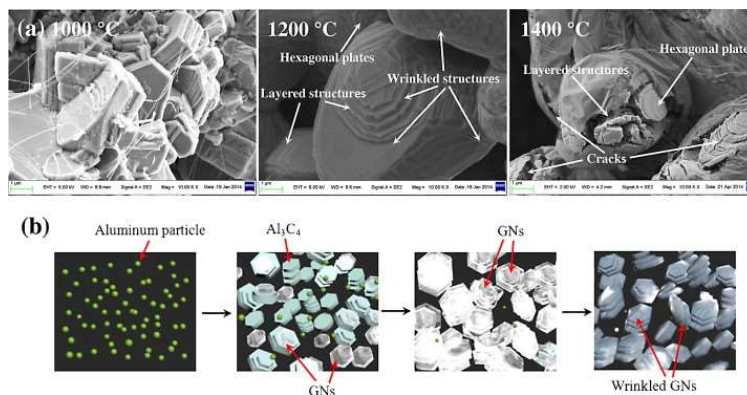


Figure 2 - (a) FESEM images of pyrolysis products from coal tar pitch in the presence of aluminum powder at three different temperatures and (b) a diagram of the supposed mechanism of GN formation [3]

The resulting GNs have a high C / O molar ratio of 60:1 and an average thickness of 3.95 nm. In addition, the resulting Al_4C_3 was found to provide a growth medium for graphene sheets.

And in work [4], a commercial sample of humic acid was used as a precursor without additional purification. The procedure for the synthesis of graphene nanosheets is shown in Figure 3.

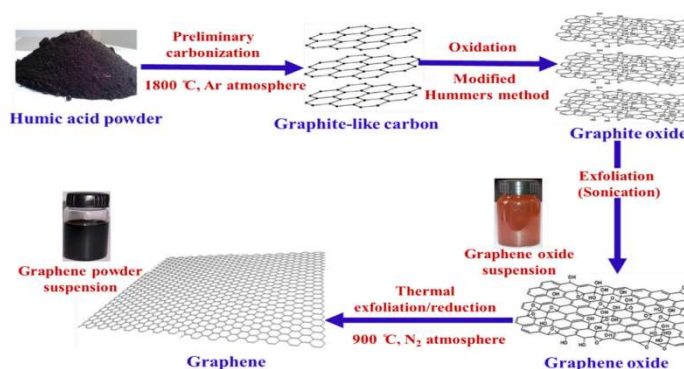


Figure 3 - Schematic representation of the procedure for the synthesis of graphene nanosheets from humic acid [4]

As shown in Figure 4a, graphene oxide has a sheet-like structure that contains several thin layers of aggregated and crumpled sheets, and these individual sheets are connected to each other to form a continuous network. In addition, a silky and wavy surface with wrinkled and folded scales is additionally observed at the edges of graphene oxide (Figure 4b). However, after thermal reduction in the stratification, the graphene images are shown in Figure 4 c and d show a curved and wrinkled paper-like morphology with a sheet structure and contain many interconnected nanoscale pores, which indicate that these layers are delaminated to a very large extent. In addition, Figure 4e and 4f show solid, wrinkled and transparent nanosheets, indicating the presence of graphene-like nanosheets.

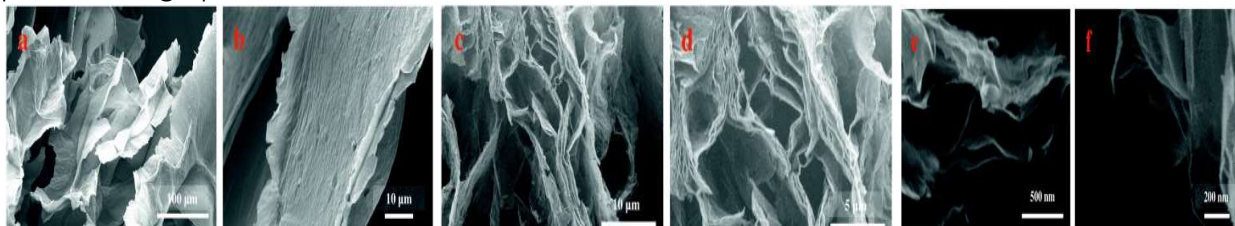


Figure 4 - SEM images of samples at different magnifications: (a) and (b) graphene oxide; (c), (d), (e) and (f) graphene nanosheets [4]

XRD patterns of carbonated humic acid, graphene oxide, and graphene are shown in Figure 5, showing clear differences. When humic acid was carbonated at 1800°C, the resulting product (Figure 5a) shows a sharp (002) peak at about 26.5° along with a faint (100) diffraction peak at about 44.5°, which is similar to XRD structures of natural graphite and carbon-based synthetic graphite indicating that humic acid forms a high degree of graphitization after carbonization at 1800°C for 2 hours. This graphitization temperature for humic acid is much lower than that of carbon-based synthetic graphite obtained from anthracite after catalytic graphitization at 2400°C, which means less energy consumption and lower cost. After oxidation of carbonated humic acid, the sharp (002) peak at about 26.5° almost disappeared, while graphene oxide shows a strong (001) peak (Figure 6b) located at about 10.7°, which is attributed to the intercalation of various oxygen-containing functional groups in graphite layers. This result is similar to the described graphene oxide using natural flake graphite as a starting material, suggesting that humic acid after carbonization is also a desirable candidate for the production of graphene oxide. However, when graphene oxide undergoes a thermal layering-reduction process, the (001) peak disappears, indicating the transformation of graphene oxide into graphene nanosheets. In addition, the (002) peak of graphene nanosheets observed in the XRD profile becomes much wider and weaker compared to carbonized humic acid, which means poor ordering of the sheets in the stacking direction, which is explained by the structure of corrugated graphene nanosheets after thermal reduction of graphene oxide.

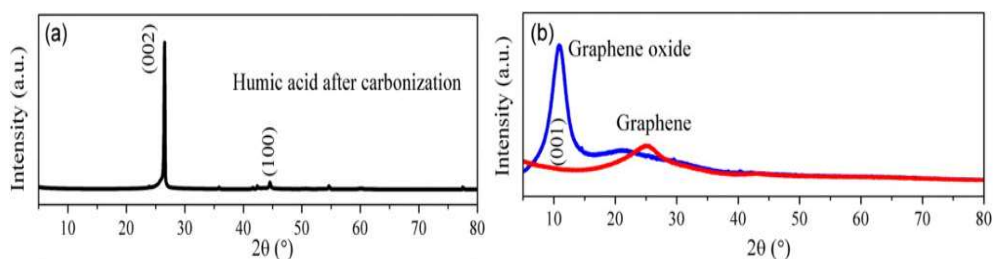


Figure 5 - X-ray patterns of samples: a) humic acid after carbonation; b) graphene oxide and graphene

To better understand the chemical composition of the surface, Figure 6a and 6b show overview XPS spectra of graphene oxide and graphene nanosheets. XPS wide scan spectra in Figure 6a show that graphene oxide and graphene nanosheets have two main peaks at binding energies of about 285 eV and 532 eV (O1s and C1s spectra). High-resolution C1s spectra for graphene nanosheets (Figure 6b) exhibit four peaks with centers 284.6 ± 0.2 , 285.1 ± 0.2 , 286.3 ± 0.2 , and 288.7 ± 0.2 eV, which are attributed to C=C-C (45.1%), C-O (33.4%), C=O (13.6%) and O-C=O (7.9%) functional groups. This result is in good agreement with the feature of hydrothermally reduced graphene oxide using high-purity graphite flakes as a precursor. It is expected that these oxygen-containing functional groups retained in the graphene product will improve the surface wettability of the graphene nanosheets in aqueous electrolyte and ensure full utilization of the surface area for charge storage.

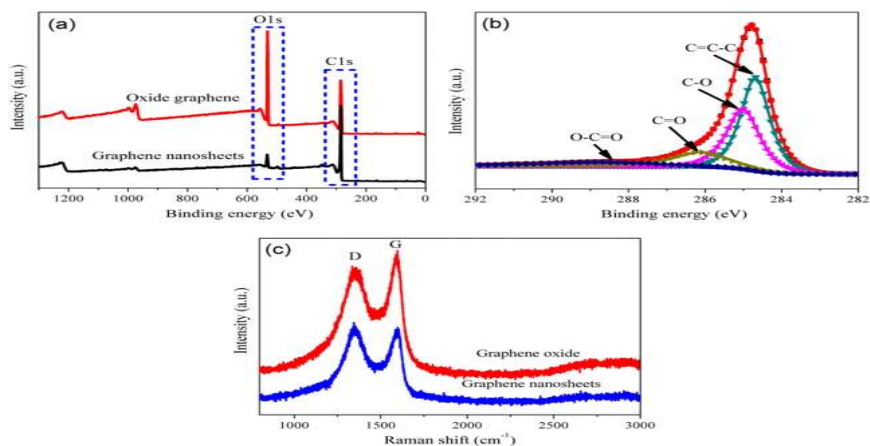


Figure 6 - XPS - exploration and Raman spectra from graphene oxide and graphene nanosheets: (a) XPS spectra with scanning width; (b) C1s high-resolution XPS spectra for graphene nanosheets; (c) Raman spectra

The chemical composition of the samples obtained from the XPS analysis is presented in table 2.

Table 2 - Chemical composition of graphene oxide and graphene nanosheets

Sample	Chemical composition (at.%)			Atomic ratio
	C	O	N	O / C
Graphene oxide	64,23	34,95	0,82	0,54
Graphene nanosheets	89,84	9,63	0,53	0,11

It is seen that graphene oxide contains 64.23 at.% C and 34.95 at.% O with a small amount of N (0.82 at.%). After thermal reduction of graphene oxide, the C content in graphene nanosheets increases significantly. This phenomenon can be explained by the decomposition of oxygen-containing functional groups in graphene oxide during thermal reduction. However, it should be noted that about 9.63 at.% O content is retained in the final graphene product, which indicates that the resulting graphene nanosheets have a large number of defects.

The obtained graphene nanosheets had a high specific surface area, a large pore volume, an interconnected mesoporous structure with homogeneous oxygen-containing functional groups in the framework, which opens up an efficient way of using inexpensive humic acid for large-scale production of graphene nanosheets for important applications in the energy field.

And the authors [5] for the synthesis of graphene used 7 different natural carbon waste, such as wood for the preparation of charcoal (carbonization). The material was wrapped in an aluminum foil with limited access to air and transferred to a chimney for imperfect burning at ~ 400 - 500°C for 5 days. The prepared charcoal or soot powders were used as raw materials to synthesize GO by using a modified Hummers' method. Next, each graphite powder was separately dissolved in H_2SO_4 , NaNO_3 was added to the solution and stirred. Then KMnO_4 was slowly added to the solution and vigorously stirred. It was warmed to room temperature with continuous stirring in a water bath. The prepared solution was diluted with distilled water. In addition, H_2O_2 was added to the solution to reduce the residual permanganate to soluble manganese ions. Residual acids and dissolved impurities were removed from the solution by centrifugation. The materials obtained by filtration were redispersed in deionized water to obtain a yellowish brown aqueous graphene oxide slurry. Then the hydrazine solution was added to the suspension while stirring it at room temperature. Finally, the suspension was boiled under reflux at 90°C for 3 hours in an oil bath.

Below are the Raman spectra of the obtained powders (Figure 7).

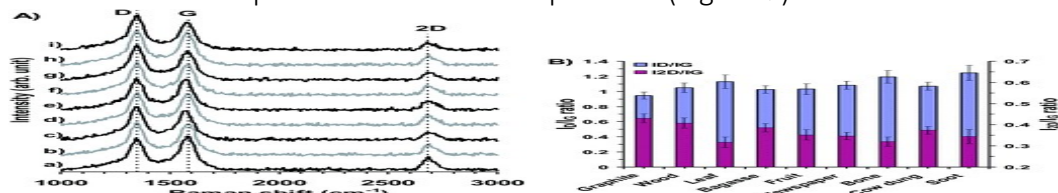


Figure 7 - Raman spectra of GO sheets synthesized from (a) highly pure graphite, (b) wood, (c) leaf, (d) bagasse, (e) fruit, (f) newspaper, (g) bone, (h) cow dung, and (i) soot as the starting materials and (B) I_D/I_G and I_{2D}/I_G ratios of the samples

It was found that the I_D/I_G ratios of the GO sheets synthesized from leaf, bone and soot materials were slightly higher than the ratios of the sheets produced from the other materials. Moreover, the GO sheets synthesized from the HPG showed the lowest I_D/I_G ratio. A higher I_D/I_G ratio can be assigned to decreasing the graphitic domain size and/or increasing the defects/disorders in the graphene sheets.

It is known that the 2D band of Raman spectra is more sensitive to the stacking of graphene sheets. For instance, the position of the 2D band of single-layer graphene is at $\sim 2679\text{ cm}^{-1}$, while for multi-layer graphene (containing 2–4 layers), the position of the 2D band shifts into larger wavenumbers by 19 cm^{-1} along with a peak broadening. Furthermore, the I_{2D}/I_G intensity ratios for single-, double-, triple- and multi- (>4) layer graphene are typically >1.6 , ~ 0.8 , ~ 0.30 and ~ 0.07 , respectively. In this work, all the GO samples synthesized from the various starting materials showed a 2D band located at ~ 2680 - 2700 cm^{-1} , indicating the presence of single- and multi-layer GO sheets in the samples. Moreover, although none of the samples showed an $I_{2D}/I_G > 0.5$, this ratio was found to be >0.3 for the whole samples. Therefore, all the GO sheets synthesized by this

proposed method (independent of the starting material used in the synthesis) showed multilayer structures with <4 ML sheets.

These results indicate that many kinds of solid carbonaceous wastes with the capability of graphitization can be applied in the production of high quality graphene sheets. Moreover, this method provides successful recycling of low-value and sometimes pollutant and/or hazardous wastes into valuable and high-quality graphene nanomaterials.

B. Xing and other authors [6] developed a cost effective and environmentally friendly strategy to prepare porous graphene via graphitization coupled with liquid oxidation-rapid thermal reduction using anthracite as a precursor. The graphitization of anthracite was carried out using a high temperature graphitization furnace. Briefly, about 100 g anthracite powder was placed in a graphite crucible and heated at 1000°C for 2 h to remove the volatile matter in a high purity argon atmosphere at a heating rate of 5°C·min⁻¹, followed by further graphitization at 2800°C with a heating rate of 10°C·min⁻¹ and held for 2 h. The graphitized sample was then cooled to room temperature and is denoted as TX-G. Coal-based graphene oxide was prepared from TX-G via the modified Hummers method. Finally, the coal-based porous graphene (denoted as CPG) was prepared using a rapid thermal reduction method. CGO was placed in a corundum crucible with a lid and quickly heated in a preheated muffle furnace (900°C) in a nitrogen atmosphere. Then the CPG was collected after cooling. The preparation procedure for CPG is illustrated in Figure 8. For comparison purposes, graphene was also prepared by using graphite as a starting material via the same preparation method, which was denoted as GR.

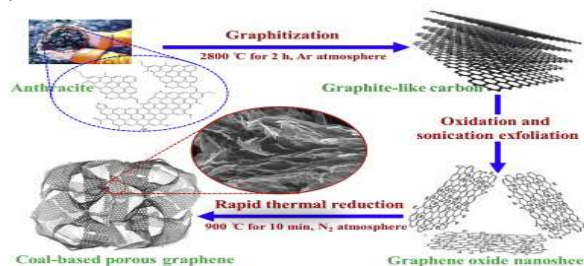


Figure 8 - Schematic illustration of the procedure for preparation of CPG

The SEM images of prepared porous graphene CPG through rapid thermal reduction show a distinct difference to that of TX-G and CGO (Figure 9).

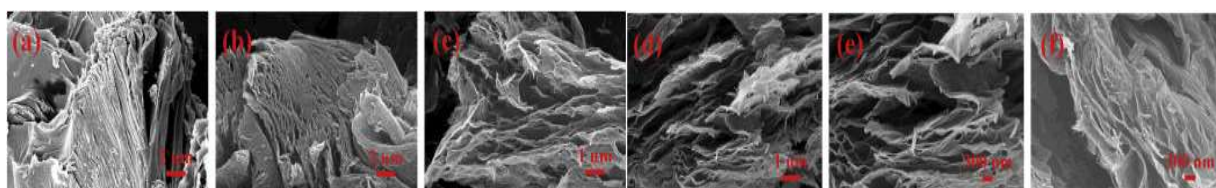


Figure 9 - SEM images of samples: (a) TX-G; (b) CGO; (c - f) CPG

As shown in Figure 9c and d, continuous highly wrinkled sheetlike structure with fluffy texture can be observed for the CPG. These individual nanosheets crosslink each other to form a 3D porous network with a large amount of different sized nanopores and apparent macropores (Figure 9e and 9f). This suggests that the CGO is efficiently exfoliated to ultrathin sheets with a porous structure. Such continuously cross-linked porous structures not only alleviate the restacking of neighboring graphene nanosheets effectively but also provide more nano-channels among graphene matrix to facilitate the transportation of electrolyte ions into the interior of the bulk material. The prepared porous graphene has continuous highly corrugated nanosheets with a micro-meso-macro hierarchical porous structure, high specific surface area (640 m²·g⁻¹) and large pore volume (3.792 cm³·g⁻¹) with a large number of structural defects such as nanopores and

reactive oxygen-containing functional groups distributed in graphene framework. These unique microstructure features ensure such porous graphene used as anode material has demonstrated to have excellent electrochemical performances.

In [7], the authors synthesized graphene on copper foil from a solid carbon source, such as humic acid, graphenol and activated carbon, by thermal annealing at 1100°C in an Ar / H₂ mixture for 1 hour at atmospheric pressure. Monocrystalline hexagonal graphene was synthesized only in the case of humic acid.

The first carbon source studied, humic acid, yielded very interesting results. SEM images of single crystal graphene on copper foil using humic acid as a carbon source are shown in Figure 10. One drop of the humic acid solution was placed over cleaned copper foils which was air dried and then annealed inside the tube furnace at 1100°C. Investigations using the SEM showed that the single crystalline graphene is about 250 nm in size. Almost all the formed single crystal is of the same size. Moreover, it has been noticed that they are formed in between unreacted humic acid. If we move away from the center of the humic acid drop, we did not find any hexagonal crystals which indicate that the crystals formed only inside the drop area of the humic acid. On the other hand, pristine graphene sheets were found to form in all areas all over the substrate around the initial humic acid droplet.

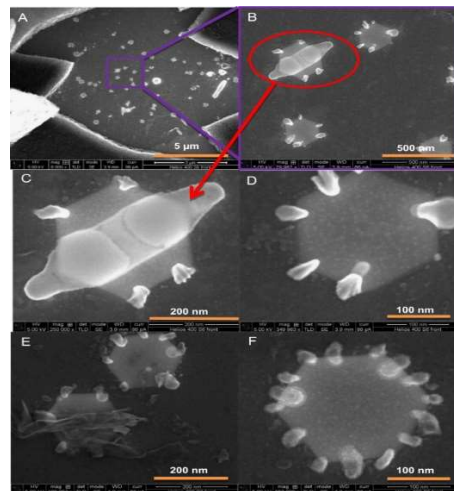


Figure 10 - SEM images for the annealed humic acid over copper foil at 1100°C for 1 h, single crystalline graphene can be seen at the middle of the humic acid drop between the big particles

The SEM images of the graphene produced from the thermal annealing of one drop of activated carbon dispersion over copper foil at 1100°C for 1 h, shown in Figure 11.

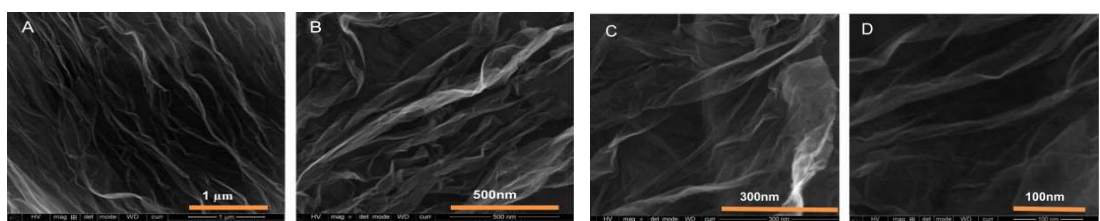


Figure 11 - Graphene nanosheets grown over copper foils under the thermal annealing of activated carbon at 1100°C

One can see that there is a big difference in the morphology of the graphene produced from the annealing of humic acid and activated carbon. In the case of activated carbon, there is a continuous layer of graphene sheets over copper foils. The wrinkles shown in Figure 11 are due to the difference in the thermal expansion coefficient between graphene and copper which produces mechanical stress on the graphene. Raman analysis confirms the existence of graphene and indicates that graphene is less defective compared to graphene grown from humic acid (Figure 12).

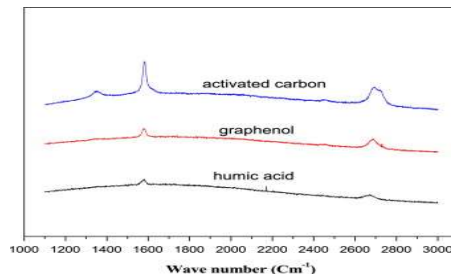


Figure 12 - Raman spectrum of the as-grown graphene using humic acid, graphenol and activated carbon over copper foils

This strongly indicates that the quality of graphene is strongly dependent upon the source of carbon. The role of humic acid in promoting graphene single crystals is not understood at this time. Further work to understand the mechanism is underway.

The use of graphene has been enormous lately. Graphene is used as a functional material in composites and it tends to improve the performance as well as the performance of the composite. Graphene, which has good elasticity, strength and porosity, has a positive effect on composites in combination with each other. The strength of some graphenes increases with compression. These graphene types exhibit strong compression under crosslinking conditions. The spongy structure of these graphenes makes them ideal for reinforcing polymer matrices. This means that graphene matrices provide high strength, increased hydrophobicity, and high conductivity [8, 9, 10].

Materials considered as superhydrophobic are self-cleaning which is required for manufacturing other devices. Sheets of graphene are hydrophobic in nature. Production of the superhydrophobic surface via the application of graphene is one of the latest technological milestones chalked in recent times. This is executed via combining of tunable laplace pressure because of its pore size being controlled. The hydrophobicity of graphene can be increased via an increase in the roughness of the surface [11]. A study by Lin et al. [12] developed reduced graphene oxide by freeze-drying. As a result of the study, a hydrophobic surface with a wetting angle of 120-130°C was obtained. The study was positive because the material used had well-controlled microscale porosity as well as roughness. By using Teflon solution as a smooth conformal coating, superhydrophobicity was achieved.

The high transparency and conductivity, like metals, along with the customizable electrical properties of graphene imply its potential for energy harvesting and storage systems as a transparent and highly flexible electrode or conductive filler, respectively. For example, graphene can be used in inorganic as well as dye-sensitized solar cell devices as an active medium or transparent electrode due to its high electrical and thermal conductivity, as well as high carrier mobility and uniform light absorption in a wide spectral range. In the case of energy storage devices, the use of graphene sheets in lithium-ion batteries may improve the performance of their devices by improving the electrical conductivity of the cathodes and introducing lithium ions into the anodes. As a result, the power density of the devices is significantly increased. On the other hand, these unique graphene layers can also play a crucial role in the development of supercapacitors due to their high electrical conductivity, chemical stability, high thermal stability

and the large surface area along with separation at the atomic level between electrode and electrolyte [13, 14].

Dye-sensitized solar cells (DSSC) are promising technology for direct solar energy harvesting. They consist of three compositions: a TiO_2 photoanode adsorbed by a dye, a counter electrode, and an iodide electrolyte, as seen in Figure 13.

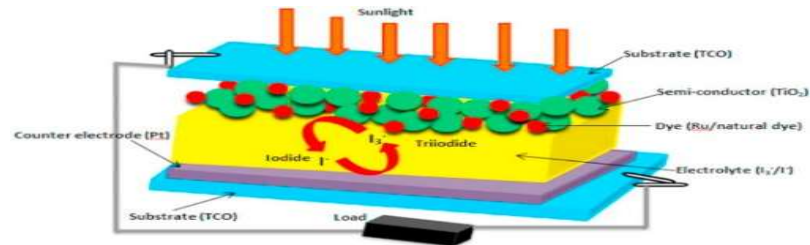


Figure 13 - Schematic diagram of DSSCs

The iodide can undergo oxidation into triiodide under a light beam on TiO_2 photoanode. This results in the release of an electron into TiO_2 . There is a movement of the electron via the external circuit to the counter electrode where it meets the triiodide hence reducing the triiodide to iodide. To speed up the process, a platinum catalyst is required. It is considered that graphene can replace such an expensive platinum catalyst with accepted performance and stability.

A graphene-polymer composite, such as blends of polyvinylidene fluoride (PVDF), polyethylene oxide (PEO and hexafluoropropylene (HFP)), has proven to be an effective method for improving DSSC characteristics [15], as shown in Figure 14. As seen in Figure 14 B, the addition of graphene to the composite polymer improved performance, and the optimal percentage of 0.8% was the best. The improved performance was related to the role of graphene in the increased surface area, better reduction of I_3^- ions, as shown in Figure 14. However, an excess of rGO (reduced graphene oxide) led to an increase in mass transfer resistivity (a decrease in the diffusion coefficient), so 0.8% RGO showed better characteristics.

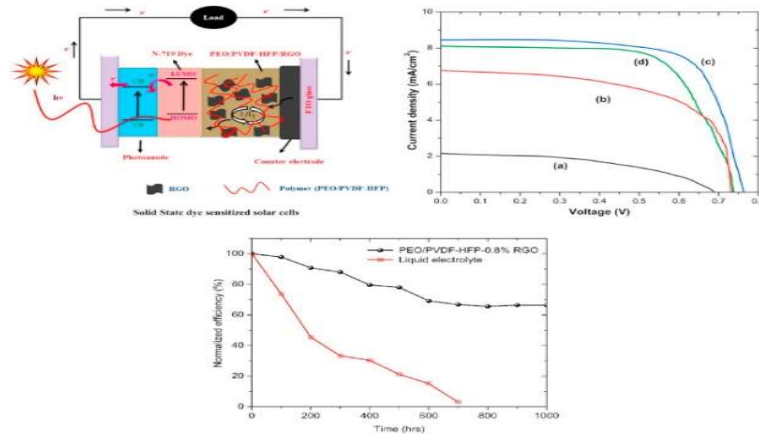


Figure 14 - (A) schematic diagram showing the incorporation of reduced graphene oxide (RGO) in DSSC electrolyte, (B) Effect different percentages of RGO, i.e., 0% (a), 0.4% (b), 0.8% (c), and 1.2% (d) in the PEO/PVDF-HFP electrolytes, and (C) the long term efficiency of the 0.8% composite membrane compared with conventional liquid electrolyte

The RGO composite membrane also demonstrated high stability as can be seen from the efficiency retention (more than 60%) after 1000 h of cell operation compared with losing all the efficiency compared to the conventional liquid electrolyte (acetonitrile) (Figure 14 C) [16].

The physical properties of graphene are very sensitive to the environment, and thus can be used for a variety of sensor applications, including electrochemical sensing and gas detection, as well as detection of deformation, pressure, magnetic field and fluid flow, and metrology applications. In addition, the functionalization-dependent characteristics of graphene allow us to develop a variety of low-cost and easy-to-use consumer electronic devices. Its large surface area, electrical conductivity, biocompatibility, simple functionalization and customizable structural morphology, along with its excellent mechanical strength, make graphene a promising candidate for a variety of biological applications, including regenerative medicine, bioimaging and cancer detection and treatment. In addition, the large surface area promotes the binding of drugs to molecules, and the solubility of graphene induced by delocalized π -electrons increases its applicability as a drug delivery system. The inclusion of graphene in the matrix of scaffold materials used in tissue engineering improves their mechanical strength and elasticity along with their selective barrier properties. As a result, significant control over cell attachment, proliferation and cell differentiation can be achieved.

The unique optical and electrical characteristics of graphene allow it to be used in a variety of photonic devices, including photodetectors, optical modulators, mode-locked lasers, and optical polarization controllers. High transparency in a wide spectral range (> 90% ultraviolet infrared radiation) and wide bandwidth limited in transit time (~ 640 GHz) along with excellent conductivity and high carrier mobility ($\sim 200 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$) promote graphene as a suitable candidate for photodetectors and optical polarization controllers.

In addition, graphene monolayers can also be realized in optical modulators by adjusting its wide spectral range of photoabsorption and response. Ultrafast relaxation of charge carriers, adjustable modulation depth, high thermal stability and conductivity, as well as the ability to tune the spectral range of graphene are used in mode-locked lasers as a saturable absorber material [17-21].

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Journalism

მეცნიერული პრიორიტეტების შესახებ (II): ქვანტური მექანიკის ზოგიერთი ფუნდამენტური პრინციპის წინასწარგანჭვრეტა და განზოგადება მსოფლიო ლიტერატურაში

იროდიონ ნარჩემაშვილი

საქართველოს მეცნიერებათა აკადემიის წევრ-კორესპონდენტი

წინამდებარე ნაშრომი წარმოადგენს [1]-ის გაგრძელებას, რომელშიც ნათლადაა ნაჩვენები, რომ შ.რუსთაველის პოემაში „ვეფხისტყაოსანი“ წინასწარგანჭვრეტილია სამყაროს კოპერნიკისეული ჰელიოცენტრული მოდელი და აინშტაინის ფარდობითობის ზოგადი თეორია. ასევე გამოთქმულია ვარაუდი, რომ პოემა შეიცავს ელექტრომაგნიტური (კერძოდ, მზის) გამოსხივების თერმული ეფექტის თეორიის საწყისებსაც. ჩვენი კვლევები უჩვენებს, რომ მსოფლიო ლიტერატურაში შეიძლება მოიძებნოს ისეთი ნაწარმოებებიც, სადაც მოცემული იქნება ქვანტური თეორიის პრინციპების წინასწარგანჭვრეტა (და განზოგადებაც კი).

ქვანტური მექანიკის საფუძველი - ჰაიზენბერგის განუზღვრელობის პრინციპი [2] - ამტკიცებს, რომ შეუძლებელია ობიექტის ზუსტი ადგილმდებარეობისა და ზუსტი სიჩქარის ერთდროულად დადგენა. ეს ხდება იმიტომ, რომ სამყაროში ყველა ობიექტი იქცევა როგორც ნაწილაკი და როგორც ტალღა (კორპუსკულარულ-ტალღური დუალიზმი) [3].

განუზღვრელობის პრინციპის ცნობილი გამოხატულებაა კავშირი ნაწილაკის კოორდინატსა (x) და იმპულსს (p) შორის. მათემატიკურად ეს კავშირი შემდეგნაირად გამოისახება:

$$\Delta x \cdot \Delta p \geq h/4\pi, \tag{1}$$

სადაც Δx არის სივრცითი კოორდინატის განუზღვრელობა (გაზომვის ცთომილება), Δp - იმპულსის განუზღვრელობა, $h=6,63 \cdot 10^{-34}$ ჯ.წმ - პლანკის მუდმივა, $\pi=3,14$. ვინაიდან იმპულსი $p=mv$ (m - მასა, v - სიჩქარე), უტოლობა (1) შეიძლება გადაიწეროს შემდეგნაირად:

$$\Delta x \cdot \Delta v \geq h/4\pi m. \tag{2}$$

რაც უფრო მცირეა განუზღვრელობა ერთისათვის (მაგალითად, Δx -სათვის), მით უფრო გაურკვეველი გახდება მეორე ცვლადი (Δv), რადგან ორი ცთომილების ნამრავლი არ შეიძლება იყოს (2) უტოლობის მარჯვენა მხარეზე ნაკლები (როდესაც $m=const$). თუ შესაძლებელი იქნება ერთ-ერთი სიდიდის დადგენა ნულოვანი ცთომილებით (ანუ აბსოლუტურად ზუსტად), მეორე სიდიდის განუზღვრელობა უსასრულობას მიაღწევს და მის შესახებ რაიმეს ცოდნა შეუძლებელი გახდება: თუ

შესაძლებელი იქნებოდა ზუსტად დადგენილიყო ნაწილაკის კოორდინატა, მაშინ მისი სიჩქარე გაურკვეველი დარჩებოდა; და თუ შესაძლებელი იქნებოდა ნაწილაკის სიჩქარის ზუსტად დაფიქსირება, მაშინ შეუძლებელი იქნებოდა მისი ადგილმდებარეობის დადგენა. პრაქტიკაში ფიზიკოს-ექსპერიმენტატორებს ყოველთვის უწევთ მოძებნონ კომპრომისი ორ უკიდურესობას შორის და შეარჩიონ გაზომვის ისეთი მეთოდები, რომელთა საშუალებითაც გარკვეული (გონივრული) ცთომილებით განსაზღვრავენ ნაწილაკის სიჩქარესაც და კოორდინატასაც.

განვიხილოთ მსოფლიო ლიტერატურული კლასიკის ზოგი ცნობილი ციტატა ყოველივე ზემოთთქმულთან მიმართებაში. „შაკ-ნამეს“ [4] ერთ-ერთ ძირითად ეპიზოდში „თქმულება როსტომზე“ აპრიმანი (ანგრა მაინძუ) ამბობს: „მე ვარ აქ და არა აქ, მე ვარ ყველგან და არსად...“*. ეს შეესაბამება სხეულის კოორდინატის (მდებარეობის) განუზღვრელობას (Δx). ამასთან, ვინაიდან აპრიმანი სულია, მისი მასაც განუზღვრელია. ეს ფაქტი კიდევ უფრო გაართულებს ზემოთმოყვანილ უტოლობებს. ამ შემთხვევაში გვექნება:

$$\Delta x \cdot \Delta v \cdot \Delta m \geq h/4\pi . \quad (3)$$

უტოლობა (3)-ის მარცხენა მხარე შეიცავს უკვე სამი განუზღვრელობის ნამრავლს და იგი უნდა ჩაითვალოს, როგორც ჰაიზენბერგის პრინციპის განზოგადება.

ექვსგარეშეა, რომ ფიზიკოს-თეორეტიკოსებს უზარმაზარი სამუშაოს გაწევა მოუწევთ [4]-ის ავტორის გენიალური მიგნების თანამედროვედ ინტერპრეტაციისთვის. აქვე უნდა აღინიშნოს, რომ უტოლობა (3)-ის განხილვისას „შაკ-ნამეს“ სხვა პერსონაჟებთან, მაგალითად, თავად როსტომთან მიმართებაში, სიტუაცია რადიკალურად შეიცვლება: მისი მასა ხომ სრულად განსაზღვრულია! თუ დავუშვებთ, $m_{როსტ.} = 80 \text{ კგ}^{**}$, მივიღებთ, რომ როსტომის ადგილმდებარეობის განუზღვრელობისას $\Delta x = 100 \text{ მ}$, უტოლობა (2)-ის თანახმად მისი გადაადგილების სიჩქარის განუზღვრელობა იქნება მინიმუმ $\Delta v \approx 10^{-35} \text{ მ}\cdot\text{წმ}^{-1}$. თუმცა, მაკროსკოპული ობიექტების განხილვისას ქვანტური ეფექტები შეიძლება (და უნდა კიდევ) უგულვებელყოფილ იქნას. აპრიმანის (სულის) მასა კი შეიძლება იყოს $m_{\text{ჰაიზ.}} \in (0, +\infty)$ ინტერვალში (აქ, საზომი ერთეული - გრამი, კილოგრამი თუ ტონა - უკვე აღარ ასრულებს როლს.) და შეიძლება მიიღოს როგორც ძალიან მცირე, ასევე ძალიან დიდი მნიშვნელობები.***

ზემოთმოყვანილი დებულებები, ალბათ, შეიძლება განივრცოს სხვა ნაწარმოებების გმირებზეც. მაგრამ სტატიის ავტორს ჯერ-ჯერობით არ შეხვედრია სათანადო მაგალითები ლიტერატურის სხვა კლასიკოსებთან.

ექვსგარეშეა, რომ მსოფლიო ლიტერატურის შედეგების შემდგომი შესწავლა ფიზიკო-ქიმიური თვალსაზრისით კიდევ ბევრ მსგავს მიგნებას გამოავლენს როგორც ქვანტურ მექანიკაში, ასევე საბუნებისმეტყველო მეცნიერების სხვა სფეროებშიც.

სტრიქონსქვედა შენიშვნები:

*გვხვდება ასეთი ვარიანტიც: "მე ვარ აქ და არა აქ, მე ვარ აქ, მაგრამ არა მთლად...". ეს ფრაზა კიდევ უფრო მეტად შეესაბამება ჰაიზენბერგის განუზღვრელობის პრინციპს ზოგად ასპექტში.

**სხეულის წონა არის ძალა და არა მასა: $P=mg$, სადაც $g=9,81 \text{ მ}\cdot\text{წმ}^{-2}$ სიმძიმის ძალის აჩქარებაა. საერთაშორისო SI სისტემაში მასის ერთეული კილოგრამია, წონის (ძალის) კი ნიუტონი (ძველი ერთეული კილოგრამ-ძალა დიდი ხანია აღარ გამოიყენება მეცნიერებასა და ტექნიკაში); და 80 კგ მასას შეესაბამება $80 \cdot 9,81 = 784,8$ ნიუტონი წონა.

ყოველდღიურობაში ჩვენ მიჩვეულნი ვართ მაღაზიაში თუ ბაზარზე გამოვიყენოთ ტერმინი „კილოგრამი“, მაგრამ გამოთქმა: „ამიწონეთ ორი კილოგრამი ყველი“ შეცდომაა. სწორია - „ამიწონეთ ორი ნიუტონი ყველი“ (წარმოიდგინეთ ამ დროს გამყიდველის რეაქცია, რომელმაც ალბათ არც კი იცის, რომ თავის სასწორზე ზომავს არა პროდუქტის მასას, არამედ სიმძიმის ძალას, რომელიც ფარდობითია და დამოკიდებულია იმ ობიექტის მასაზე, რომელიც იზიდავს სხეულს: მთვარეზე, მაგალითად, $g_{ათ.}=1,62 \text{ მ}\cdot\text{წმ}^{-2}$, ხოლო იუპიტერზე კი $g_{იუპ.}=24,79 \text{ მ}\cdot\text{წმ}^{-2}$. შესაბამისად, ნებისმიერი სხეულის წონა მთვარეზე 6-ჯერ ნაკლები, იუპიტერზე კი 2,5-ჯერ მეტია, ვიდრე დედამიწაზე. ($9,81:1,62\approx 6$; $24,79:9.81\approx 2,5$.)

***იმის წარმოსადგენად, თუ რაოდენ მცირეა როსტომისათვის Δv , ჯერ განვიხილოთ, პირიქით, ძალიან დიდი ავოგადროს რიცხვი $N_A=6\cdot 10^{23}$. ეს იმდენად დიდი რიცხვია, რომ სცილდება ჩვენი წარმოსახვის ფარგლებს: ვთქვათ, 1 გრამი წყალი თანაბრად იქნა გადანაწილებული დედამიწის მთელ ზედაპირზე. შესაძლებელია გამოითვალოს, რომ ზედაპირის ერთ კვადრატულ მეტრზე წყლის 50 მილიონზე მეტი მოლეკულა იქნება მოთავსებული. ავიღოთ ავოგადროს რიცხვის შებრუნებული სიდიდე ($\approx 10^{-24}$). ეს ძალიან მცირე რიცხვი 100 მილიარდჯერ მეტია როსტომის Δv -ზე. აპრიმანის შემთხვევაში კი საქმე გვექნება ყველანაირ (მათ შორის, სრულიად რეალურ) სიდიდესთან.

ლიტერატურა

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Technical Sciences

Artificial Intelligence in Cardiovascular Disease Detection: A Superficial Overview

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Abstract: In this comprehensive review, we delve into the rapidly evolving domain of Artificial Intelligence (AI) methodologies employed in the detection and diagnosis of cardiovascular diseases - the globe's leading cause of mortality. These methods, which harbor immense potential to revolutionize healthcare, span from complex Machine Learning algorithms, Deep Learning models, and Neural Networks, to cutting-edge advancements in Natural Language Processing. Diverse in their mechanics, these AI-driven techniques exhibit varying levels of predictive precision and are often commingled to enhance diagnostic accuracy. Notably, we shine light on convolutional neural networks (CNNs), which have shown unprecedented promise in analyzing medical imaging for heart disease detection. Furthermore, we scrutinize the intriguing paradox of AI systems; while their sophistication permits extraordinary diagnostic precision, their perplexity and opacity often create barriers to widespread acceptance. Our review also explores real-world applications, effectiveness, and the ethical dimensions surrounding AI in cardiovascular disease detection. Ultimately, the article seeks to convey the transformative potential of AI methodologies in cardiovascular medicine and address the vital need for a holistic understanding of their mechanisms, benefits, and limitations.

1. Introduction

The advent of the 21st century heralded a digital revolution, with technology seeping into every sphere of human life, including healthcare. One of the most significant breakthroughs has been in the realm of Artificial Intelligence (AI), which has begun reshaping the healthcare landscape by providing advanced solutions for disease detection, patient care, and health management. In the crucible of medical conditions, cardiovascular diseases (CVDs) remain the leading cause of death globally. The potential to utilize AI methodologies in detecting these diseases presents a transformative prospect [1]. This research paper provides a comprehensive review of various AI methods applied in the detection of CVDs.

The paper first explores the pertinence of AI in the realm of CVD detection. The introduction of AI into healthcare is not just a trend, but a response to pressing issues faced by the modern world such as aging populations, rising healthcare costs, and the burden of chronic diseases [2]. CVDs, in particular, create a significant strain on healthcare systems. The early and accurate detection of these diseases can help manage their impact and potentially save millions of lives annually. It is here that AI methods, with their ability to glean insights from vast amounts of data and learn intricate patterns, hold immense promise [3].

An exposition on various AI methodologies used in CVD detection forms the backbone of this paper. We traverse the gamut from Machine Learning (ML) algorithms, Deep Learning (DL) models, and Neural Networks to the state-of-the-art developments in Natural Language

Processing (NLP). These techniques exhibit a varying degree of complexity and predictive accuracy, often used in combination to improve diagnostic efficacy [4].

A key area of focus in this paper is the use of convolutional neural networks (CNNs) in medical imaging. CNNs, a class of deep neural networks, have shown remarkable results in image recognition tasks [5]. When applied to medical imaging, these AI models can detect subtle patterns and abnormalities that may be missed by the human eye, making them a potent tool for CVD detection.

However, our review is not without critical evaluation. The intricate and opaque nature of AI systems, often termed the 'black box' problem, poses a significant challenge. Although the complexity of these systems allows for advanced diagnostic capabilities, their perplexity hinders their understanding and acceptance in the medical community. Therefore, a segment of our paper discusses the need for 'explainable AI' in the field of CVD detection.

The practical applications of AI methods in real-world settings, their effectiveness, and associated challenges constitute a major part of this research. We consider the integration of AI with existing healthcare systems and its impact on healthcare professionals. The paper also delves into the ethical considerations and implications of using AI for CVD detection, such as data privacy, patient consent, and the risk of automation bias. Figure 1 demonstrates applications in coronary artery disease [6].

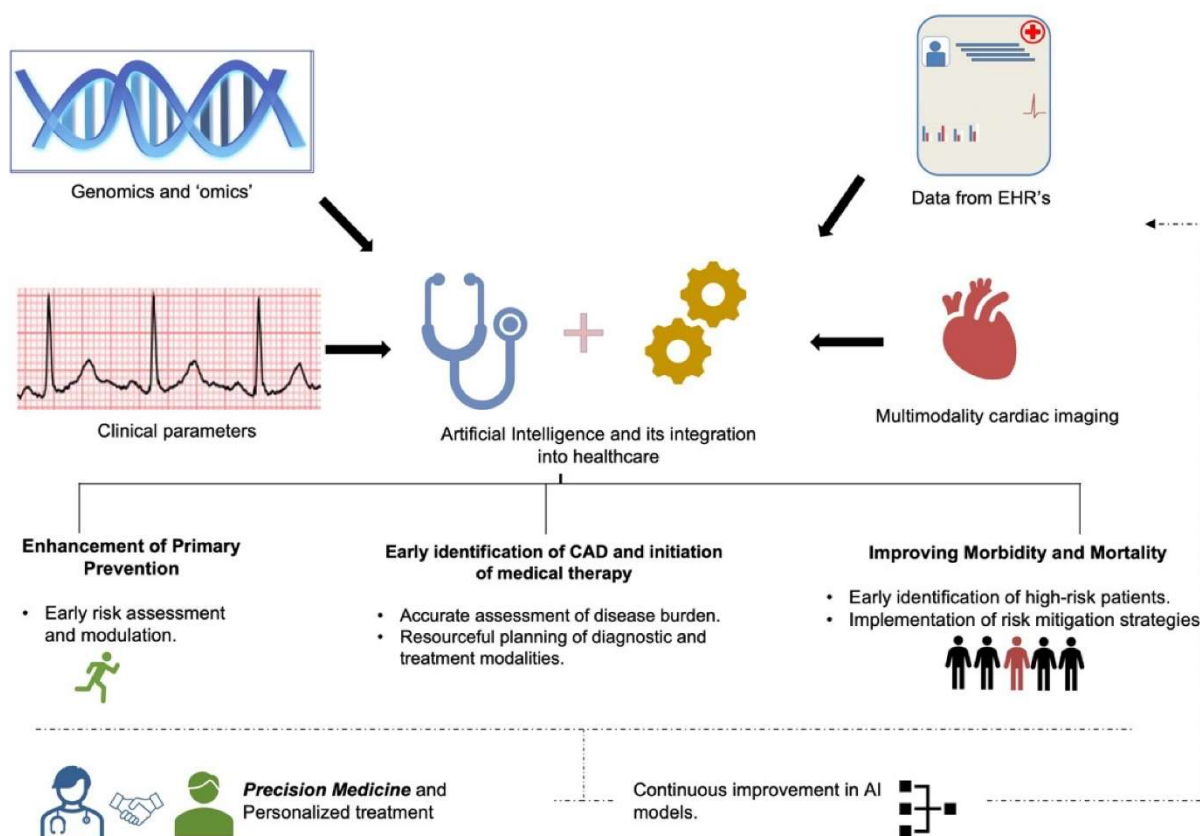


Figure 1. Current and Future Applications of Artificial Intelligence in Coronary Artery Disease [6]

In conclusion, our research aims to provide a comprehensive understanding of the various AI methodologies employed in CVD detection. By shedding light on their potential benefits, practical applications, and the challenges they present, we hope to stimulate more in-depth dialogue and research in this field, ultimately contributing to the advancement of AI in cardiovascular medicine. The ultimate goal is not to replace the human touch in medicine but to augment it, leveraging the power of AI to improve the detection and management of cardiovascular diseases, and thus, enhance patient outcomes.

2. Machine Learning in Heart Diseases Detection

Machine Learning (ML), a prominent subset of Artificial Intelligence (AI), has progressively established itself as an instrumental tool in the early detection and diagnosis of heart diseases [7]. This section of the review paper, under the broader theme of 'Review of Artificial Intelligence Methods in Cardiovascular Disease Detection,' is dedicated to a detailed exploration of the application of ML techniques in heart disease detection, elucidating their mechanisms, benefits, limitations, and practical applications [8].

The essence of ML lies in its ability to 'learn' and improve from experience without being explicitly programmed, making it apt for medical applications where voluminous and intricate data sets are common. In the context of heart disease detection, ML algorithms can analyze a multitude of patient data – such as medical histories, genetic profiles, and physiological parameters – and discern patterns that may be imperceptible or non-intuitive to human clinicians. This vast reservoir of data, coupled with the power of ML, can result in models that predict cardiovascular risks with a high degree of accuracy [9].

There exist several types of ML algorithms, each with its unique strengths and use-cases. Supervised learning algorithms, for instance, require labeled data for training, where each instance of data is associated with a correct output [10]. In the domain of heart disease detection, algorithms can be trained using a dataset where each patient's medical data is labeled with the presence or absence of heart disease. Decision tree, random forest, and support vector machine are among the frequently used supervised learning algorithms in this field.

Unsupervised learning, on the other hand, does not require labeled data [11]. These algorithms uncover hidden patterns and correlations in the data, offering valuable insights. K-means clustering and hierarchical clustering are two unsupervised learning techniques widely used in heart disease detection, enabling the identification of patient groups with similar symptoms or disease patterns.

There are also reinforcement learning algorithms, which learn to make decisions based on the idea of reward and penalty [12]. Though less commonly used in heart disease detection, these algorithms have shown potential in treatment strategy optimization, which indirectly influences disease detection.

Deep Learning (DL), a subset of ML, is another area of interest. Inspired by the human brain's structure and function, DL utilizes artificial neural networks with multiple layers (hence, 'deep') to model complex patterns in data [13]. The application of DL techniques, such as Convolutional Neural Networks (CNNs), in heart disease detection, particularly in the analysis of cardiovascular images, has shown promising results.

However, despite the apparent potential of ML in heart disease detection, its adoption is not without challenges. The quality of the training data is paramount for effective ML; erroneous or biased data can lead to incorrect or biased predictions [14]. There's also the issue of overfitting, where the ML model performs exceptionally well on training data but poorly on unseen data, reducing its practical utility.

Another important challenge is the 'black box' nature of many ML models, especially deep learning algorithms. The lack of interpretability hinders clinicians' understanding and trust in these systems, an issue that requires urgent attention to foster the integration of ML in clinical practice [15].

Furthermore, ethical and legal considerations cannot be overlooked. With ML algorithms requiring access to vast amounts of personal health data, issues of privacy, consent, and data security come to the fore. The development and application of ML models must be in alignment with ethical guidelines and regulations to ensure respect for patient autonomy and privacy.

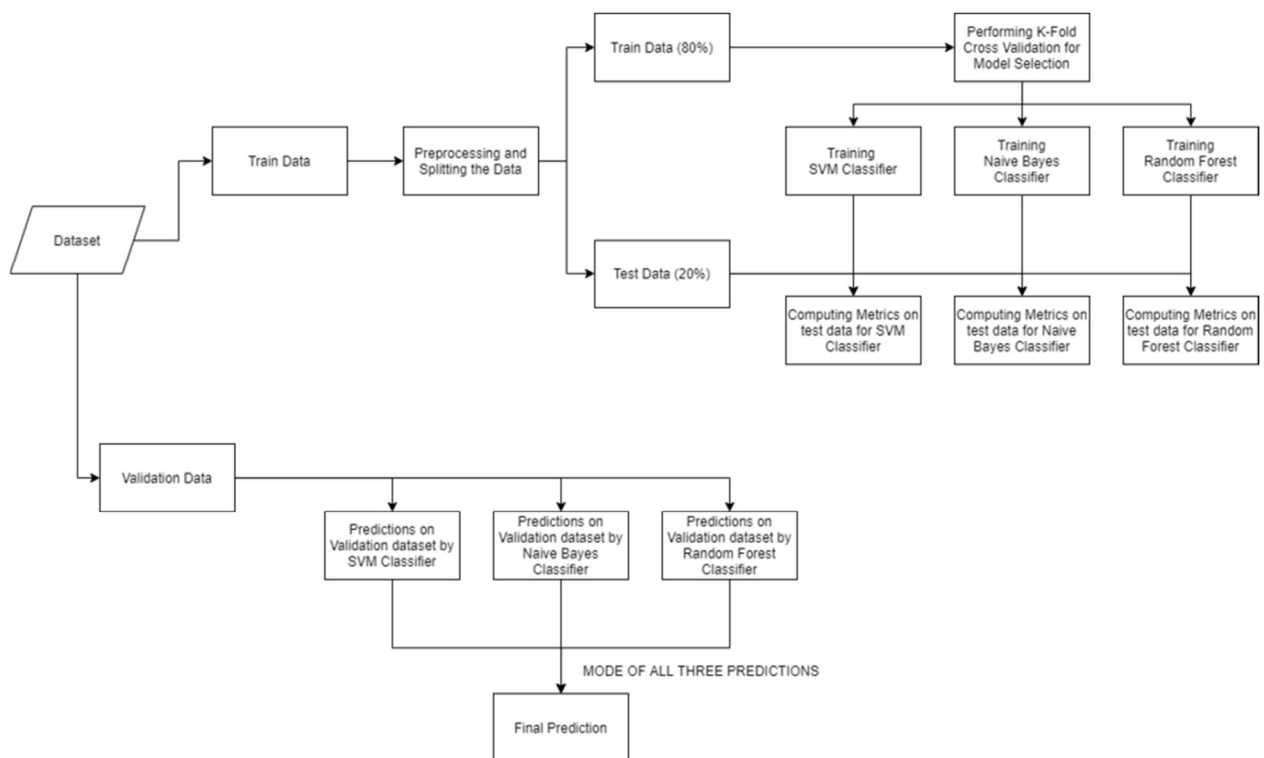


Figure 2. Applying Machine Learning in Heart Disease Detection [16]

In conclusion, ML methodologies, in their various forms, offer promising avenues for heart disease detection. The capacity to handle big data and discern complex patterns enables these algorithms to make accurate predictions, potentially aiding in early detection and timely intervention. However, the effective incorporation of ML into clinical practice will necessitate a multidisciplinary approach, addressing technical challenges, fostering system interpretability, and ensuring ethical integrity. Future research should focus on these aspects, paving the way for ML to revolutionize the landscape of cardiovascular disease detection and overall patient care.

3. Deep Learning in Heart Diseases Detection

Deep Learning (DL), an advanced branch of machine learning inspired by the neural architecture of the human brain, has revolutionized numerous fields, including the healthcare sector [17]. One of the most compelling applications of DL lies in heart disease detection. This section of the review paper will explore the use of DL techniques in detecting heart diseases, elucidating their mechanisms, applications, advantages, challenges, and future prospects.

Unlike traditional machine learning algorithms that linearly analyze data or require manual feature extraction, DL algorithms are capable of learning hierarchical representations from data [18]. This capability enables DL techniques to model and understand complex patterns, making them particularly adept at interpreting intricate medical data. For heart disease detection, DL models can scrutinize a variety of data, including medical images, electronic health records, and genomic sequences, with a high degree of accuracy [19].

Convolutional Neural Networks (CNNs), a type of DL model, have particularly distinguished themselves in the domain of medical imaging. In heart disease detection, CNNs can analyze echocardiograms, MRI scans, and other cardiovascular imaging modalities to identify anomalies that might indicate the presence of heart disease [20]. For instance, CNNs have demonstrated remarkable proficiency in detecting conditions such as myocardial infarction, coronary artery disease, and heart failure from medical images. They can identify subtle features that might be missed by human eyes, leading to improved diagnostic accuracy.

Moreover, Recurrent Neural Networks (RNNs), another type of DL model, have been employed in the analysis of time-series data such as heart rate or ECG signals [21]. With their ability to retain

information from past inputs, RNNs can capture temporal dependencies, allowing for the detection of heart diseases such as atrial fibrillation [22].

Despite these promising advancements, the use of DL in heart disease detection is not without obstacles [23]. DL models require a substantial amount of data for effective training. Data scarcity, especially quality annotated data in the medical field, can pose significant challenges. Techniques such as data augmentation and transfer learning can help to some extent, but the issue remains a major hurdle.

Another substantial challenge is the interpretability, or rather, the lack thereof, in DL models. Termed as the 'black box' problem, DL algorithms often provide little insight into how they arrive at a particular decision [26]. This lack of transparency hinders trust and acceptance in the clinical setting, where understanding the reasoning behind a diagnosis is crucial. Techniques such as Layer-wise Relevance Propagation (LRP) and Class Activation Mapping (CAM) have been proposed to improve the interpretability of DL models, but the problem persists.

The ethical and legal considerations surrounding DL applications in healthcare, like data privacy, security, and patient consent, are of paramount importance. Strict adherence to these considerations is essential to ensure the ethical use of DL techniques in heart disease detection. Clear guidelines and regulations on data usage and protection are needed to mitigate potential misuse or breaches.

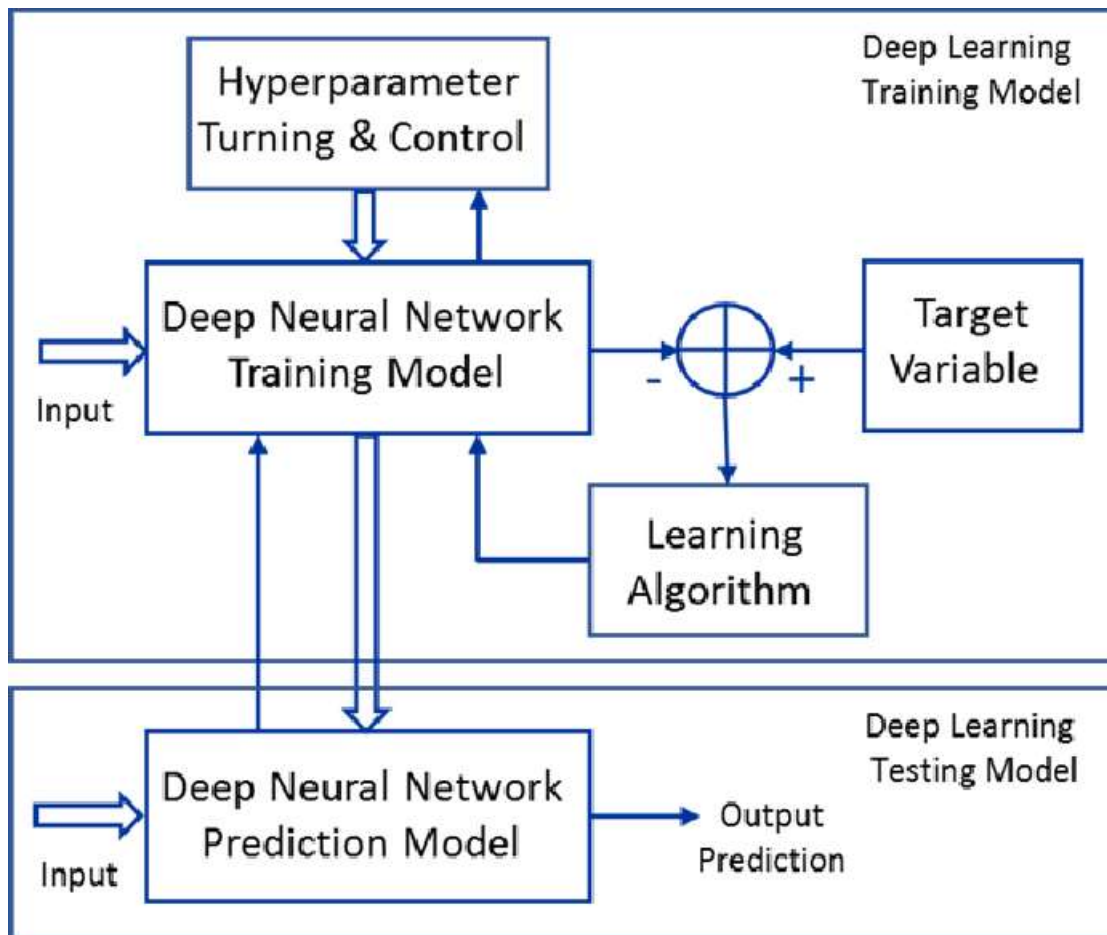


Figure 3. Deep Learning in Heart Disease Detection [27]

In conclusion, DL techniques offer significant potential for heart disease detection, promising to enhance diagnostic accuracy and, in turn, patient outcomes. However, the path to their widespread clinical adoption is fraught with challenges. These range from technical issues like data scarcity and model interpretability to ethical concerns. Despite these obstacles, the future of DL in heart disease detection appears promising. Continued research and development, coupled with

ethical considerations, will pave the way for DL techniques to become an integral part of cardiovascular healthcare, ultimately contributing to a future where heart diseases can be detected earlier and treated more effectively.

4. Datasets

Quality datasets play a crucial role in the development and testing of Artificial Intelligence (AI) methods used for heart disease detection. Datasets represent a collection of related information, which in the context of this review, primarily pertains to medical data, including patient demographics, genetic profiles, medical histories, physiological parameters, and diagnostic images. This section delves into the significance of datasets, common types, their sources, usage, challenges, and the ethical considerations involved in their employment for AI applications in cardiovascular disease detection.

Medical datasets come in many forms. For example, Electronic Health Records (EHRs) contain valuable information about a patient's medical history, diagnoses, medications, treatment plans, and even family history of diseases [28]. These EHRs can be used to train AI algorithms to detect patterns linked to cardiovascular diseases. Clinical databases, such as the Framingham Heart Study dataset, which has been instrumental in identifying common factors or characteristics contributing to cardiovascular diseases, also play a critical role.

Diagnostic imaging datasets, comprising MRI scans, CT scans, ultrasound images, and angiograms, among others, are particularly valuable for AI methodologies like Machine Learning (ML) and Deep Learning (DL). For instance, echocardiographic images can be fed into a DL model to identify patterns associated with heart diseases, such as myocardial infarction or congestive heart failure. Other datasets, like genomic or proteomic datasets, are increasingly being used with AI to discover genetic markers and protein-level changes associated with heart diseases [29].

The quality and diversity of datasets used to train AI models directly impact their performance. Quality refers to the accuracy and completeness of data. Incomplete or incorrect data can lead to poorly trained models, reducing their diagnostic accuracy. Diversity, on the other hand, concerns the representation of different patient groups. Non-diverse data can result in AI models that are biased or not generalizable to a broader population.

There are several publicly available databases for cardiovascular research, like the UCI Machine Learning Repository's heart disease dataset, PTB Diagnostic ECG Database, and the ESC Heart Failure Long-Term Registry. However, many institutions and research groups also have proprietary datasets that they use for their specific projects.

Despite their importance, the use of datasets in AI applications is fraught with challenges. One of the main issues is data privacy and security [30]. Medical data is highly sensitive, and its misuse can lead to severe violations of privacy. As such, all data must be anonymized or de-identified before use. Even then, data sharing across institutions and borders can be complex due to varying data protection laws and ethical standards.

Data quality is another challenge. Real-world clinical data is often messy, incomplete, and inconsistent. Data cleaning and preprocessing, therefore, become essential steps before the data can be used to train AI models [31]. However, these processes can be time-consuming and require substantial computational resources.

In conclusion, datasets are the lifeblood of AI applications in heart disease detection. They fuel the algorithms, enabling them to learn and make accurate predictions. However, the use of datasets comes with substantial challenges, particularly in terms of data quality and privacy. As AI continues to make inroads into healthcare, addressing these challenges is essential. Moving forward, it will be important to establish strict standards and guidelines for data use in AI, ensuring the ethical use of data while also facilitating the progress of AI in heart disease detection. Efforts should also be made to enhance data quality and availability, such as through data cleaning techniques and

the establishment of collaborative data sharing platforms. With these measures, datasets can truly unleash the potential of AI in heart disease detection.

5. Discussion

Artificial Intelligence (AI) has profoundly transformed many sectors, including healthcare, where it offers significant potential to improve patient outcomes, particularly in the detection of cardiovascular diseases. Throughout this review paper, we've scrutinized the application of AI techniques in heart disease detection, dissecting their mechanisms, advantages, challenges, and the role of datasets. In this discussion section, we will integrate these findings, contextualize their significance, and suggest directions for future research.

AI methodologies, including Machine Learning (ML) and Deep Learning (DL), have demonstrated remarkable capabilities in diagnosing cardiovascular diseases. By leveraging vast datasets, these algorithms can discern intricate patterns that might escape human cognition, resulting in highly accurate predictions. The utilization of ML and DL in areas such as EHR analysis, medical imaging, and genomics can significantly enhance diagnostic accuracy and enable timely interventions [32]. While the application of supervised ML models like Decision Trees, Support Vector Machines, and Random Forests in cardiovascular disease detection is already well-documented, unsupervised learning techniques have shown promise in identifying novel disease patterns and patient groups. Furthermore, reinforcement learning algorithms, although less common, can aid in optimizing treatment strategies, indirectly influencing disease detection.

Deep learning models, such as Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), have shown potential in medical imaging and time-series data analysis, respectively. Particularly, CNNs can identify subtle anomalies in cardiovascular images that can indicate the presence of disease, aiding in early detection and treatment [33].

Despite these advancements, it is important to acknowledge the challenges associated with AI in cardiovascular disease detection. Data quality and diversity are key determinants of the efficacy of AI models. Real-world clinical data is often messy, inconsistent, or incomplete, and the lack of diverse data can result in models that are biased or not generalizable to broader populations. Consequently, robust data cleaning and preprocessing techniques are essential.

Additionally, the 'black box' problem, referring to the lack of interpretability of many ML and DL models, hinders clinicians' trust and acceptance of AI systems [34]. Transparent and interpretable models are crucial for integrating AI into clinical practice. While techniques like Layer-wise Relevance Propagation (LRP) and Class Activation Mapping (CAM) have been proposed, substantial work remains to be done in this domain.

Legal and ethical considerations surrounding data privacy, security, and patient consent also pose challenges. It is crucial to ensure the ethical use of AI techniques and protect patient data. Clear guidelines and regulations on data usage and protection, along with robust data security measures, are necessary to mitigate potential misuse or breaches.

The role of datasets in AI applications cannot be overstated. As the 'fuel' for AI algorithms, datasets directly impact model performance. Publicly available databases like the UCI Machine Learning Repository's heart disease dataset provide valuable resources for researchers [35]. However, there is a need to improve data quality and availability, perhaps through the establishment of collaborative data sharing platforms.

Future research in AI for cardiovascular disease detection should address these challenges and focus on fostering model interpretability, enhancing data quality and diversity, and ensuring data privacy and security. Multi-disciplinary collaborations between AI researchers, clinicians, data scientists, ethicists, and policy-makers are necessary to facilitate these advancements.

Furthermore, while this review has focused on the use of AI in heart disease detection, AI can also be utilized in other areas of cardiovascular care, such as treatment planning, disease management,

and prognosis prediction. Therefore, exploring these applications could be another exciting direction for future research.

In conclusion, AI methodologies offer a promising avenue for improving cardiovascular disease detection. While challenges exist, with sustained research, collaboration, and attention to ethical considerations, AI has the potential to revolutionize the landscape of cardiovascular healthcare, contributing to improved patient outcomes.

Conclusion

Artificial Intelligence's transformative potential in healthcare, particularly in cardiovascular disease detection, is evident. As explored in this review, AI methodologies, including Machine Learning and Deep Learning, offer significant promise in enhancing the diagnosis of heart diseases. These techniques can discern complex patterns in vast and diverse datasets, enabling highly accurate predictions and allowing for timely medical interventions. Notably, these advancements could lead to improved patient outcomes.

However, as with all profound advancements, challenges exist. These include issues pertaining to data quality and diversity, model interpretability, and ethical considerations related to data privacy and security. Addressing these challenges is a priority for the future and will require robust research and collaboration across various disciplines, including AI researchers, clinicians, data scientists, ethicists, and policy-makers.

In conclusion, while AI's journey in cardiovascular disease detection is marked by both promise and challenges, it is undoubtedly an exciting and critical area of exploration. With continuous research, ethical considerations, and collaborative efforts, AI is poised to make substantial contributions to the detection of heart diseases, ushering in a new era in cardiovascular healthcare.

Acknowledgements

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FORECASTING THE PRICES OF NEW HOUSES IN KAZAKHSTAN

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Abstract: The subject of examination in this article centers around the real estate market in Kazakhstan, particularly focusing on price forecasting within the sector. A comprehensive analysis of price trends for new housing in Kazakhstan from 2001 to 2023 serves as the basis for a thorough predictive study. The article presents the forecasted prices for new housing in the country over the forthcoming three-year period. The analysis considers several independent variables that could impact dynamics of new housing prices in the country, such as inflation rate, GDP per capita, population density, index GINI, building materials price index, minimum subsistence level, poverty, unemployment, and real income index.

Key words: New housing; Kazakhstan; Data; forecast; empirical analysis.

Introduction

For the majority of Kazakh families, the pressing need to improve their living conditions has become a critical issue. Recent sociological surveys indicate that approximately 70% of the country's population requires better housing conditions¹. As one of the priority areas in Kazakhstan's development strategy until 2030², housing construction has taken on significant importance as a national task. However, insufficient volumes of housing construction, sharp fluctuations in prices for residential real estate require a systematic study of issues related to the forecasting and assessment of factors affecting the cost of residential real estate in the Republic of Kazakhstan.

According to data from the Bureau of National Statistics³, the period from March 2022 to March 2023 witnessed a notable surge in prices for apartments in new buildings, averaging at 9.3 percent across Kazakhstan. The average price per square meter stood at 489,226 tenge.

Aktobe, Aktau and Kostanay became the leaders in price growth with an increase of 25.4 percent, 24.3 percent and 19.3 percent respectively, while Shymkent, Kokshetau and Taraz were the regions with the lowest growth - from 2 to 3.5 percent. The most expensive apartments were expected to be in the capital - 587,406 tenge per square meter in new buildings. Housing in Almaty is slightly cheaper - 562,701 tenge for new housing.

Given the urgency of the housing problem in Kazakhstan, it is crucial for government and stakeholders to focus on strategies that promote affordable housing construction. This article provides research into factors that affect housing costs and a predictive analysis to estimate the future prices of new housing in Kazakhstan.

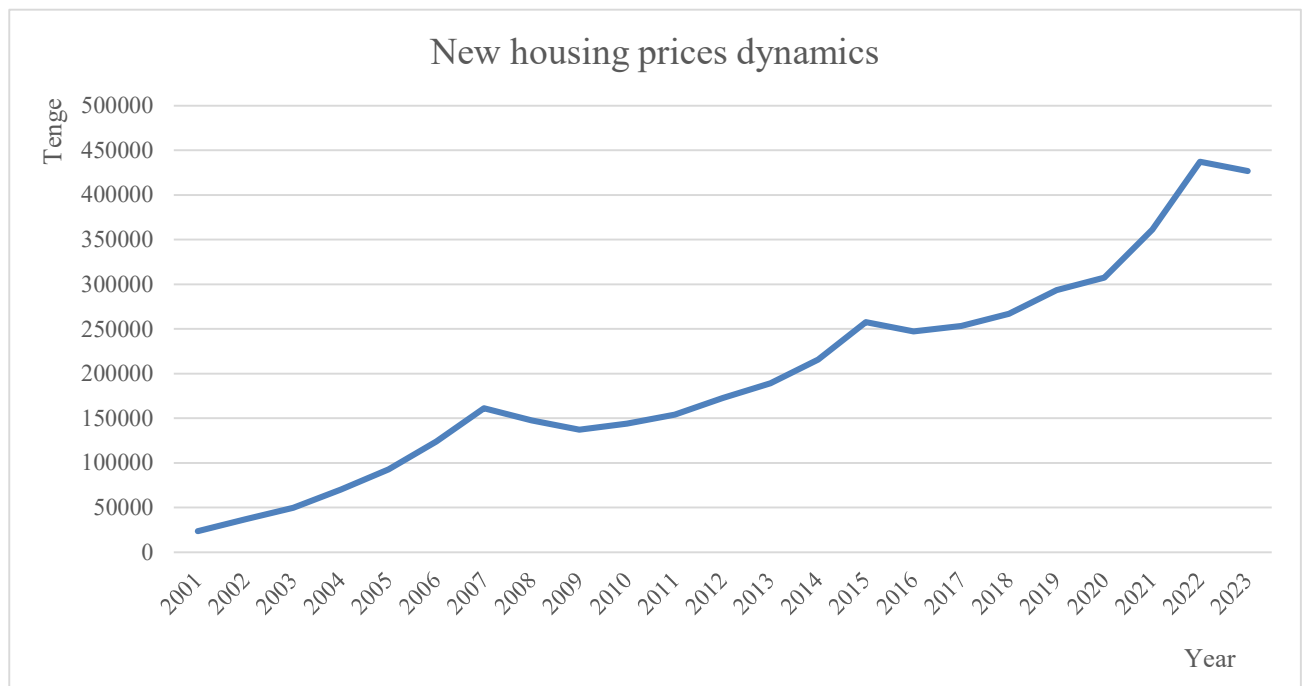
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³Bureau of National Statistics. <https://stat.gov.kz/en/>

Empirical analysis

The datasets for this research were collected from the official site of Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. The data type used is a time series with the time interval between 2001-2023 years.



As the graph shows, the price of new houses had a considerable rise from 2001 to 2007 equal to 137709 tenge. Then, the price went down for 24k tenge in 2009. After that, the price rocketed again between 2009 and 2015 years. It went up to 257644 tenge, which is approximately 2 times higher than it was in 2009. The next year the price witnessed a fall for 10k tenge again. The price for new houses had an increase till 2022 for 190k and dropped in 2023 for 10k. There is a rising trend every 6-8 years on average and a slight decrease for 1-2 years at the end of the trend.

This study is aimed at forecasting the price for the next several years. Hence, there is no need to test any hypotheses. However, we should find factors that are likely to affect the price in order to accomplish multiple regression. Thus, some investigations of others' papers were made. Eventually, the independent variables that could have the impact are inflation rate, GDP per capita, population density, index GINI, building materials price index, minimum subsistence level, poverty, unemployment, and real income index.

Prior to getting to the regression part, it is better to test for multicollinearity:

	PRICE	INFLATION	GDP_PC	POP_D	I_GINI	I_PBUILD	SUBSISTANCE	POVERTY	UNEMPL	REAL_INC
PRICE	1									
INFLATION	0,3525	1								
GDP_PC	0,7090	0,0919	1							
POP_D	0,9735	0,2269	0,7206	1						
I_GINI	-0,5276	-0,0831	-0,7566	-0,5189	1					
I_PBUILD	-0,5595	0,2079	-0,3780	-0,6085	0,4464	1				
SUBSISTANCE	0,9807	0,3148	0,6733	0,9822	-0,4526	-0,5801	1			
POVERTY	-0,7118	-0,1946	-0,8869	-0,7063	0,7552	0,2791	-0,6460	1		
UNEMPL	-0,8165	-0,1123	-0,9115	-0,8409	0,8370	0,5285	-0,7710	0,9061	1	
REAL_INC	-0,6198	-0,0821	-0,5724	-0,7044	0,6229	0,5160	-0,6374	0,5840	0,6752	1

PRICE – the price for new houses in Kazakhstan.

POVERTY – the rate of poverty.

I_{GINI} – the statistical measure used to represent income or wealth inequality within a population in Kazakhstan.

INFLATION– the inflation rate,
 UNEMPLOYMENT– the unemployment rate,
 GDP_{pc}– GDP per capita,
 I_PBUILD– building materials price index.
 SUBSISTANCE– minimum subsistence level.
 POP_D– the density of the population.
 REAL_INC– real income index.

If we put a glance at the table above, we will see that there are highly correlated independent variables. Correlation coefficients greater than 0.75 were highlighted in red. Therefore, we must remove some variables to avoid multicollinearity.

	<i>PRICE</i>	<i>INFLATION</i>	<i>POP_D</i>	<i>I_GINI</i>	<i>I_PBUILD</i>	<i>REAL_INC</i>
<i>PRICE</i>	1					
<i>INFLATION</i>	0,352541073	1				
<i>POP_D</i>	0,973494978	0,226891794	1			
<i>I_GINI</i>	-0,52762937	-0,083067901	-0,518882761	1		
<i>I_PBUILD</i>	-0,559549477	0,207927036	-0,608507795	0,446352277	1	
<i>REAL_INC</i>	-0,619752983	-0,082071516	-0,704364213	0,622872629	0,51596175	1

Independent variables like poverty, unemployment, minimum subsistence level, GDP per capita were taken out.

The subsequent step was to conduct the regression itself.

Regression output:

<i>Regression Statistics</i>	
Multiple R	0,988741821
R Square	0,977610389
Adjusted R Square	0,97102521
Standard Error	19747,37248
Observations	23

The coefficients interpretation:

According to the Multiple R = 0.9887, there is an extremely strong positive correlation between the price of new houses and independent variables.

R Square = 0.9776, which tells that approximately 98% of the variance in the price of new houses in Kazakhstan is explained by the independent variables.

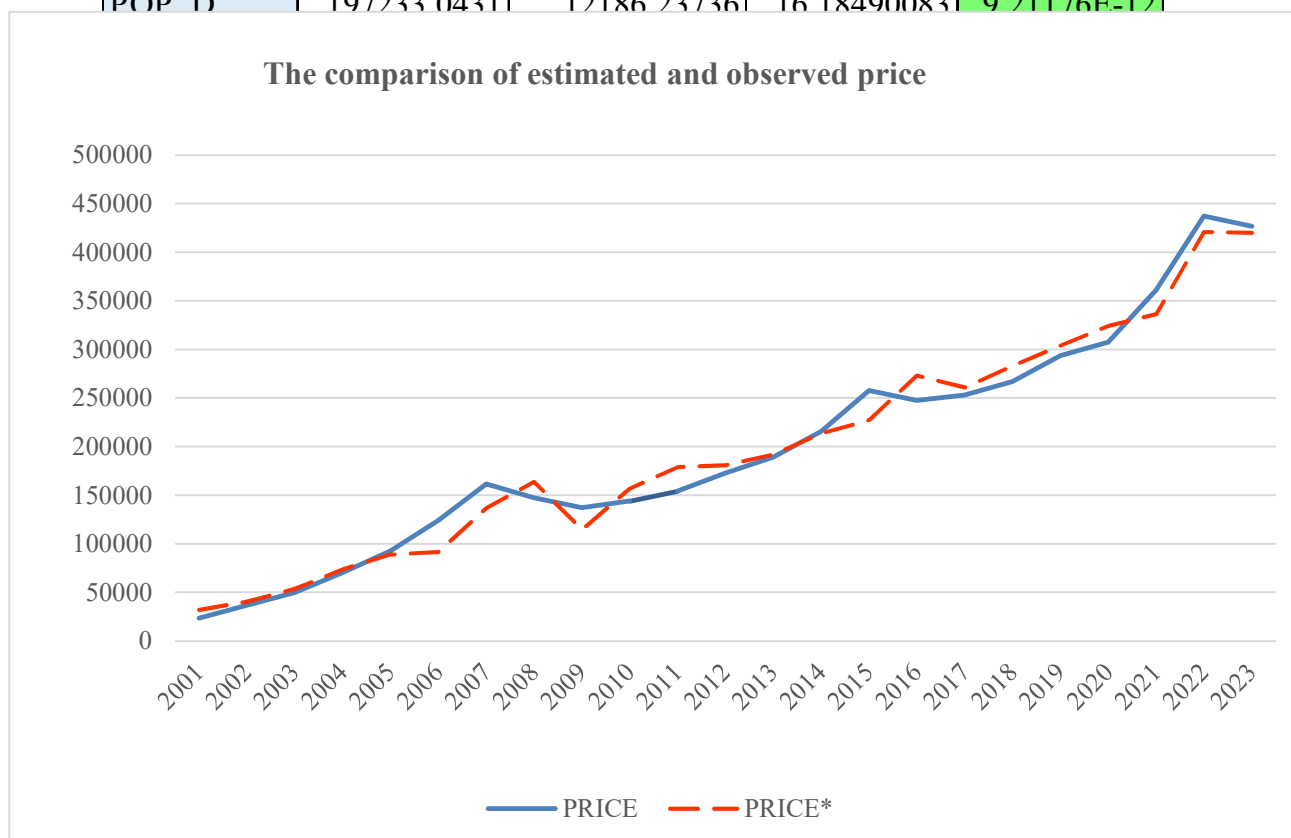
ANOVA results

ANOVA	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	2,89459E+11	57891768882	148,4561466	2,09762E-13
Residual	17	6629298237	389958719,8		
Total	22	2,96088E+11			

The F-value for the regression model that is shown in the table is 148,4561466, and the associated significance level (p-value) is approximately 0,00000000000021. The calculated F-value was compared with the critical F-value. Therefore, we can tell if the overall model is significant or not. Hence, such an extremely small p-value indicates that the probability of observing such a large F-value can be equated to zero. So, the regression model is statistically significant.

If we take look at the table below, we will see that “I_GINI” and “I_PBUILD” have p-values that are less than 0.05. Since their p-values are too high, we can say that the effect of Gini index and the building materials price index are insignificant at 5% significance level. As the p-values of inflation, population density and real income, their influence on the price are significant.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-1106562,233	353885,7356	-3,126891315	0,006140114
INFLATION	4698,056908	1412,038393	3,327145304	0,003989243
POP_D	197233,0431	12186,23736	16,18490083	9,21176E-12



The overall model is pretty reliable as the regression results are sufficiently high. The regression equation can be used to compute the predicted price of new houses in the country:

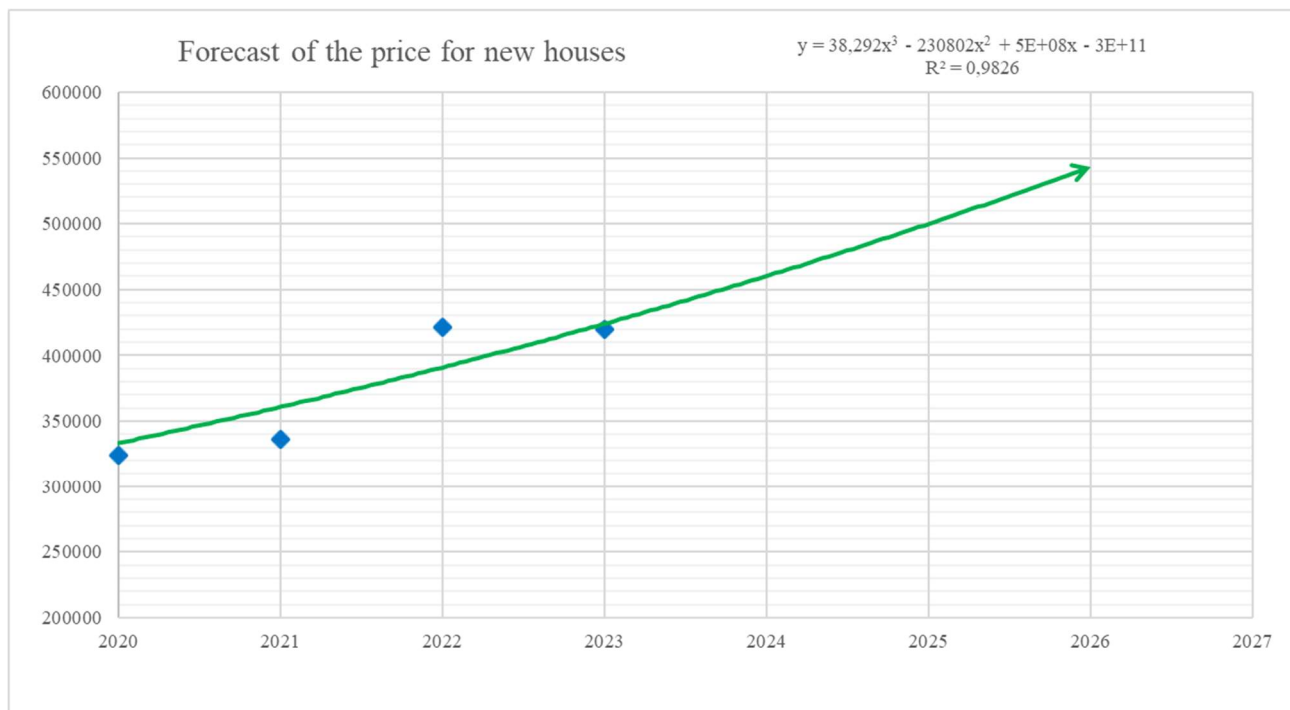
$$PRICE^* = -1106562.23 + 4698.06 \times INFLATION + 197233.04 \times POP_D - 482806.57 \times I_GINI - 1535.29 \times I_PBUILD + 3296.81 \times REAL_INC + u$$

The graph above demonstrates the change of the new house prices over the last 22 years and the dynamics of the estimated price. It can be seen that the patterns of two lines are quite similar.

The next step was to use the estimated values of the price to conduct a regression once again. This time we regressed time in years over the estimated prices. The non-linear regression model used was polynomial with 4 terms:

$$\widehat{PRICE} = 38,29 * YEAR^3 - 230\,802,15 * YEAR^2 + 463\,732\,219,32 * YEAR - 310\,588\,294\,127,05$$

The R Squared value is 0.9826, which says that there is a strong positive correlation between time and the price.



In accordance with the forecast results, the price will go up to 460000 tenge in 2024, 500000 tenge in 2025, and 550000 tenge in 2026 on average.

Conclusion.

To sum up, this study was made to find possible determinants of the new housing prices in Kazakhstan and to make a forecast of the prices for the next 3 years. The time interval of the dataset collected is between 2001 and 2023. The results of the analysis estimate that the factors that have a significant effect on price are inflation, population density, and real income. When it comes to the prediction, conforming to the forecast results, the price may go up to 460000 tenge in 2024, 500000 tenge in 2025, and 550000 tenge in 2026 on average.

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