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APPLICATION AND PROSPECT OF NEW MEDIA IN SPORTS NEWS DISSEMINATION

Hizbullah Bahir
Senior teaching Assistant, Physical education Department, Education Faculty, Kandahar University, Kandahar city, Afghanistan
Email: bahir.hizbullah@hotmail.com

Sayed Anwershah Abed
Teaching Assistant Journalism Department, Journalism and public relations Faculty, Kandahar University, Kandahar, Afghanistan
E-mail: abed575@hotmail.com

Mujeeb Rahman Ziarmal
Senior teaching Assistant, Public relations Department, Journalism and public relations Faculty, Kandahar University, Kandahar, Afghanistan
E-mail: mujeeb.zayarmal@yahoo.com\

ABSTRACT

In the process of the rapid development of Internet technology, new media has been maturing with the development of information technology, providing a new way for information dissemination. The media promotes sports and draws people's attention to them. In this research, the same topic was revealed with documentary data, the qualitative method was used to clarify the topic, and all the accurate information that was published in reliable books, scientific magazines, and internet sites was collected. The application of new media in the process of sports news dissemination requires research and analysis of the application and development of new media, which is conducive to mastering the application of new media in sports news, understanding the development trend of new media, and giving full play to sports news. spread effect. Research findings suggest that new media has revolutionized the way sports news is disseminated and consumed. With the rise of social media platforms, sports fans now have access to instant updates and analysis from a variety of sources, including traditional news outlets, blogs, and social media influencers. The application of new media in sports news dissemination has led to increased engagement between sports fans, athletes, teams, and media outlets. Social media platforms such as Twitter, Instagram, and Facebook allow for real-time communication and interaction

between these groups, creating a more immersive and interactive experience for fans. The prospects for new media in sports news dissemination are tremendous, with continued advancements in technology and the increasing popularity of social media platforms. Overall, the research suggests that the application of new media in sports news dissemination has had a significant impact on the industry, and the prospects for future growth and innovation through new media channels are bright.

Keywords: new media, sports news dissemination, application analysis, development prospect

INTRODUCTION

New Media Overview

New media is constantly changing. To define new media technically, it can be defined as a new type of media that provides information to the audience. New media includes mobile communication, Internet, and new TV technology. Therefore, in the process of applying various technologies, the channels and methods of media information dissemination are relatively rich, and no longer rely solely on traditional newspapers, radio, television and other media for information dissemination. Compared with traditional media, the biggest advantage of new media is that information spreads quickly, spreads widely, is not limited by time and space, and has a huge amount of information resources. In addition, in the process of new media information dissemination, the roles between the audience and the communicator are not fixed, which is also a prominent feature of new media in information dissemination(Xu et al., 2023). Application and significance of new media in sports news dissemination in the process of the rapid development of new media technology, it is of great significance to apply it to sports news dissemination, mainly in the following aspects: First, a cross-media information delivery platform can be constructed(Rouhi DEHKORDI, 2017). In recent years, the rapid development of social media has provided a good platform for the public to participate in news dissemination. When reporting sports news, new media can cooperate with traditional media to build a cross-media communication platform. When new media cooperates with traditional media, it can effectively innovate the content and form of communication in a very short period of time, continuously stimulate the vitality of new media in the process of sports news dissemination, and satisfy the audience's expectations to the greatest extent. information content needs. Second, it can improve the objectivity and authenticity of sports news. At present, in the process of sports news dissemination, the framework of new media is relatively mature and perfect, and media workers should

fully integrate the advantages of traditional media according to the application value of different media types. At the same time, it is necessary to give full play to the application advantages of new media technology and improve the quality of sports news dissemination(Bellamy, 2009). In order to achieve this goal, when new media disseminate sports news, they need to learn from traditional media and pay attention to the depth of sports news content so as to reflect the spiritual needs and value of sports news. In addition, it is necessary to comprehensively analyze and summarize the laws, results, and turning point data of sports events. In this way, the application value of sports news dissemination can be further enhanced. Third, we can tap into and utilize the technological advantages of new media. New media itself is a new type of media developed on the basis of network technology, information technology, and digital technology(Bird et al., 2013). When disseminating sports news, it is necessary to give full play to the application advantages of these advanced technologies and deeply integrate new media technology with sports news dissemination. This requires the continuous development and application of new media technology in order to provide effective and reliable technical support for sports news dissemination. At the same time, it is also necessary to make full use of the current carriers, such as digital TV, Internet TV, and mobile TV, and continuously expand the channels of new media for disseminating sports news(Pilar et al., 2019). Fourth, it is conducive to enhancing the interaction and communication levels of the public when receiving sports news. In order to give full play to the interactive advantages of new media in the process of sports news dissemination, it is necessary to build a platform for social public interaction and communication. Especially in the era of mobile Internet, the roles between the audience and the communicator are highly transformable(Yuldashev, 2021). Whether it is a professional reporter or an ordinary audience, they can use new media to complete the sports news dissemination process. In response to this situation, it is necessary to give full play to the advantages of the new media as a communication platform to prevent the dissemination of false news information during the dissemination process and affect the positive role of the new media in the dissemination of sports news. For example, in the Rio Olympics, the Olympic official website used new media to interact and communicate with the audience in real time. Both Chinese and foreign mainstream media have made full use of the website to launch the Olympic Channel and set up a variety of interactive sections, which is of great help in expanding the influence of the Olympic Games and deepening their significance(Nataliia et al., 2019).

Research's significance

Research plays a critical role in the development of new media technologies and their application in sports news dissemination. By analyzing audience preferences, understanding emerging technologies, and keeping up to date with industry trends, researchers can help sports media organizations stay ahead of the curve and deliver content that resonates with their target audience. New media technologies such as social media, mobile apps, live streaming, and virtual reality have transformed the way sports news is disseminated. These technologies offer new opportunities for sports media organizations to engage with their audiences, increase brand awareness, and generate revenue streams. The prospect of new media in sports news dissemination is vast, with the potential to revolutionize the way sports fans consume and interact with their favorite sports. For instance, social media platforms like Twitter, Facebook, and Instagram allow fans to connect with their favorite athletes and teams, share their opinions, and receive breaking news in real-time. Mobile apps and live streaming services enable fans to access sports content on-the-go and watch games from anywhere in the world. Virtual reality technology provides a fully immersive experience, allowing fans to feel like they are part of the action and attend sporting events remotely. In conclusion, the application of new media technologies in sports news dissemination offers significant benefits to sports media organizations and fans alike. By embracing these technologies and conducting ongoing research into emerging trends, sports media organizations can enhance their engagement with audiences, increase revenues, and stay competitive in an ever-evolving landscape.

Practical application of new media in sports news dissemination

Practical application of new media in sports news dissemination

1. Provide a communication platform for sports fans.

In the process of continuous application and development of new media technology, it can provide audiences with a platform to choose news content according to their own needs and greatly mobilize the enthusiasm of sports fans to pay attention to sports news. On the communication and interaction platform, the audience can express their own opinions based on the received sports news(Chen, 2018). In addition, the sports news disseminated on the interactive platform is not restricted by region or time. Therefore, the audience can communicate and express their opinions on the content of sports news at any time. This method can enhance the breadth and depth of sports news dissemination and reflect a strong feedback effect.

2. Publicity and promotion of sports events

In the information age, we must give full play to the value of information in order to use it to obtain economic benefits. The process of sports news dissemination, especially the effective publicity and promotion of some major events before they are held, is an important measure to increase the attention of sports events. At present, when new media publicize and promote sports news, they can use Weibo, professional websites, WeChat public accounts, etc. to achieve the purpose of publicity and promotion(Hughes & Shank, 2005). This kind of publicity and promotion can lay a good audience base for the broadcast and live broadcast of sports events and is conducive to expanding the influence of sports events. Before the start of sports events, users can collect and find information related to sports events on the Internet and learn about the event arrangements in advance, which is of positive significance in promoting the dissemination of sports news. For example, before the start of the Guangzhou Marathon, in order to achieve the purpose of promoting the event, the operator directly released the appointment running app to the market. This product can not only record and track the user's running exercise and running route but also introduce the marathon. And various functions, such as competition pre-registration, can increase the popularity of the event to a large extent and increase the audience's participation in the event(Gumantan et al., 2021).

3. Broadcast and live sports events

The application of new media in the process of sports news dissemination has great advantages; for example, sports events can be rebroadcast or live broadcast. Since the successful hosting of the Beijing Olympic Games, the attention of Chinese people to various sports events has been increasing, which has laid a good audience foundation for the application of new media in the live broadcast and broadcast of sports events. When live broadcasting and rebroadcasting sports news, it can be divided into text broadcasting and video broadcasting according to the difference in communication media. The live text broadcasting appeared earlier, while the live video broadcasting appeared relatively late(Rowe & Gilmour, 2010). Before the application of new media to the dissemination of sports news, live text and live video coexisted. However, with the rapid development of new media technology, live video has become one of the main modes of broadcasting, including live broadcasting of sports news. As early as 2015, my country's Internet giant Tencent signed a contract with the NBA to sell the copyright of NBA sports events to Tencent, opening a new era of live broadcast of sports events in my country. The timeliness of using new media to broadcast sports events is relatively strong, and it can bring audiences the exciting feeling of major sports events in fierce confrontation, which is the main advantage of live video

broadcasting. Especially in the process of continuous development of online video live broadcast, viewers can use the live broadcast platform to communicate and enhance the audience's interactivity and pleasure.

The development prospects of new media in the application of sports news dissemination

At present, the application of new media in the process of sports news dissemination is relatively extensive, and with the further development of new media technology and its in-depth application in the process of sports news dissemination, new media forms and means will be used in the process of sports news dissemination. Great changes occurred. Especially with the development of mobile terminal technology, the application of new media in sports news dissemination in the future will be more inclined toward mobile terminals, which will become an important carrier for people to receive sports news. In addition, public transportation will also become one of the main application scenarios for new media in the dissemination of sports news. For example, on public transportation such as subways, buses, taxis, and high-speed trains, some promotional posters can be used to promote sports events.

Conclusion

The application of new media in sports news dissemination can greatly enhance the breadth and depth of sports news dissemination, broaden the channels of sports news dissemination, meet the audience's various demands for sports news, and enhance the interactivity and openness of sports news dissemination. However, there are also some problems when using new media to disseminate sports news. For example, some false information spreads faster, which may mislead the audience. Therefore, it is necessary to fully explore the development model of new media in the process of sports news dissemination, give full play to the positive role of new media in news dissemination, and promote the prosperity and development of sports news dissemination.

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ELEKTROTEXNIKA VA ELEKTRONIKA SOHASIDA KUCH TIRISTORLARINI BOSHQARISHDA OPTOELEKTRONLI ELEKTR ZANJIRLAR TADQIQI

Dilmurod Shuxratovich Xushvaqtov
Raxmatillo Choriyevich Karimov
Islom Karimov nomidagi Toshkent davlat texnika universiteti
raxmatillo82@mail.ru

ANNOTATSIYA

Maqolada elektrotexnika va elektronika sohasida kuch tiristorlarini optoelektronli rezistiv zanjirlar yordamida boshqarish masalasi ko‘rib chiqilgan. Optron elementlarni qo‘shimcha vositalar yordamisiz elektr zanjirlarining boshqarish tizimida boshqaruv zanjirlari sifatida elektron boshqarishning asosiy mohiyatlari haqida ma’lumot berilgan. Shu bilan birga optoparaning volt-amper xarakteristikasi va o‘zgaruvchan tokli bir fazali statik o‘chirgichni optoelektronli rezistiv zanjirlari bilan boshqarish sxemasi tajribadan o‘tkazilib, asosiy xarakteristikalari keltirilgan.

Kalit so‘zlar: Optron, volt-amper xarakteristika, tiristor, diod, impuls, diodli ko‘prik, boshqaruv elektrodi, tumbler, kontaktsiz uzgich, kondensator, chegaralovchi qarshilik (rezistor).

ABSTRACT

The article deals with the issue of controlling power thyristors using optoelectronic resistive circuits in the field of electrical engineering and electronics. Information on the basic essence of electronic control of optron elements as control circuits in the control system of electric circuits without the help of additional tools is provided. At the same time, the volt-ampere characteristic of the optocoupler and the control scheme of the alternating current single-phase static circuit breaker with optoelectronic resistive circuits were tested and the main characteristics were presented.

Keywords: optocoupler, volt-ampere characteristics, thyristor, diode, impulse (signal), diode bridge, electrode control, toggle switch, proximity switch, capacitor, limiting resistance (resistor).

KIRISH

Optron texnikasining rivojlanishi, dunyo sanoati ishlab chiqarishiga katta imkoniyatlar yaratdi. Bugungi kunda optronlar

o‘zining ajoyib xususiyatlari bilan elektron boshqarish apparaturasida yanada ko‘proq ishlatilmoqda. Optronli elementlarning qo‘llanishi, qo‘shimcha vositalar yordamisiz kuch tiristorlarining boshqarish tizimidagi boshqaruv zanjirlari va kuch zanjirlarining elektron yechimlariga imkon beradi.

Optronlar - bu shunday optoelektron uskunalarki, unda bir-biri bilan konstruktiv bog‘langan foto qabul qiluvchi va nur uzatgich mavjud.

Elektrotexnika va elektronika sohasida optronli uskunalar texnikasi ikki guruhga bo‘linadi. Ya’ni birinchi guruh - optopara, nur tarqatuvchi va fotoulagich elementlaridan hamda ikkinchi guruh - optoelektronli integralli mikrosxema-kuchaytiruvchi uskunalar bir nechta yoki bitta elektronga ulangan bir nechta yoki bitta optoparadan tashkil topgan.

Konstuktiv tuzilish bo‘yicha optronlar - yarimo‘tkazgich va integral sxemalardan ajralmaydi. Optoparalar va optoelektronli mikrosxemalar kirish va chiqish qismlarining aloqasi nurli signallar yordamida bo‘lishi bilan ajralib turadi.

Shuningdek, elektrotexnika va elektronika sohasida optronlarning asosiy ajraluvchi mohiyatlari quyidagilardan iborat:

- kirish va chiqish signallari orasidagi ideal elektr (galvanik) yechimini ta’minlab beradi;

- elektron ob’ektlarni kontaktsiz boshqaruvini amalga oshirish imkoniyatini mavjudligi, boshqaruv tizimini konstruktiv yechimlarining moslanuvchanligi;

- optik kanal bo‘yicha ma’lumotning bir yo‘nalishida tarqalishi va qabul qiluvchining nur uzatgichga teskari ta’sirining yo‘qligi;

- boshqaruv tizimida signal berishni ta’minlab beruvchi boshqaruv toklarining kichikligi;

- optron zanjiri bo‘ylab, doimiy va impulsli signalni uzatish imkoniyatining mavjudligi;

- optik materialga optik kanalning ta’sir etish yo‘li bilan chiqish signalini boshqarish imkoniyatidan har-xil turdagi datchiklarni ishlab chiqarish mumkinligi;

- foto qabul qiluvchi funksional mikroelektronli uskunalarni ishlab chiqish imkoniyatini mavjudligi;

- optronlarni ishlatishda optik kanallarning kuchli elektromagnit maydonlarining ta’sirchanligi;

- boshqa turdagi yarimo‘tkazgichli va mikroelektronli uskunalar bilan fizikaviy, konstruktiv va texnologik mos keluvchanligi.

Optron galvanik yechim elementi - maksimal kuchlanish (U_{maks}) va yechimli qarshilik (R_{yechim}) hamda o‘tish sig‘imi ($C_{o‘tish}$) bilan tavsiflanadi.

Elektrotexnika va elektronika sohasida optronlarning muhim qo‘llash sohalaridan biri bu - katta quvvatli kuch zanjirlarini optik va kontaktsiz boshqaruv imkoniyatini mavjudligi.

Elektronika uskunalarning umumiy klasifikatsiyasi bo‘yicha, optoparalar yarimo‘tkazgichli uskunalarga, optron mikrosxemalar esa gibridli integral sxemalar sinfiga kiradi. Optoparalar diodli, tiristorli va tranzistorlilarga bo‘linadi, optronli mikrosxemalar esa, optoparalarning bir bazasi sifatida ishlatiladi.

Tiristorli optoparaning chiqish volt-amper xarakteristikasi - oddiy tiristorlarning volt-amper xarakteristikasiga o‘xshaydi.

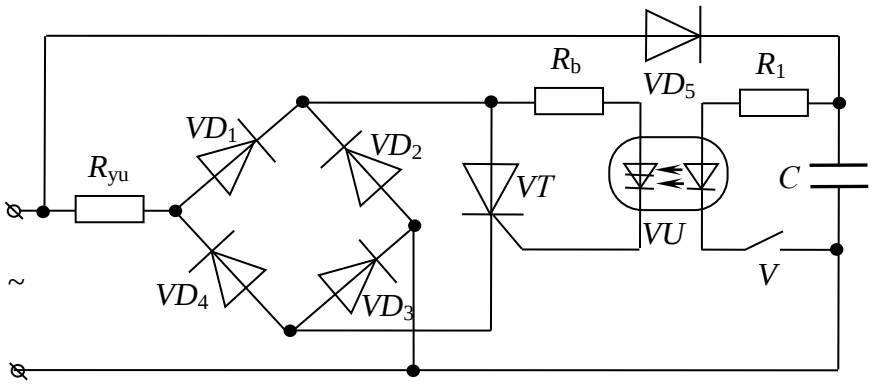
ADABIYOTLAR TAHLILI VA METODOLOGIYA

Tiristorli optoparaning parametri - bu nurlanuvchi dioddan o‘tayotgan kirish tokidir. Kirish toki, ya’ni boshqaruv tokida volt-amper xarakteristikaning «*to‘g‘rilanishi*» kuzatiladi, bu narsa fototiristorning yoqilgan holatiga bog‘liqdir. Optoparaning kirish signalini vaqti, boshqaruv tokiga bog‘liq. Boshqaruv impulsi amplitudasi kuchaytirilgan tartibdagi tiristorli optoparalarning ishlash vaqtida, yoqish vaqtini pasayishiga erishilsa, o‘chirilish vaqti 20-30% ga ko‘payadi.

Ishlab chiqarish jarayonlarini kompleks avtomatlashtirishda, zamonaviy diskret boshqaruv tizimini amalga oshirish talab etiladi. Bularni kontaktsiz optoelektron zanjirlari bazasi asosida bajarsa bo‘ladi.

Optron elementlarini kuch tiristorlarining boshqaruv zanjirida qo‘llaganda, ularning ish tartiblarini rostlash imkoniyatini ko‘rib chiqamiz.

1-rasmda o‘zgaruvchan tokli bir fazali kontaktsiz statik o‘zgich sxemasi ko‘rsatilgan. Ushbu sxemada VD_1-VD_4 diodli ko‘prikning diagonaliga rostlangan tokda yoqiladigan, bitta *VT* tiristor, o‘zgaruvchan kuchlanish manbaiga VD_1-VD_4 diodli ko‘prikni R_{yuk} yuklama bilan ketma-ket ulangan.



1-rasm. Bir fazali statik kontaktsiz uzgich sxemasi

Yuklamani tarmoqqa ulash uchun kuch tiristorining boshqaruv elektrodiga o‘zgarmas tokning musbat impulsini berish kerak. Bu vaqt oralig‘ida tiristor o‘zgaruvchan kuchlanishning butun davri davomida ochiq holatda bo‘ladi va yuklamadan o‘zgarmas tokning ikkita yarim davri oqib o‘tadi. Tokning bitta yarimdavri R_{yuk}, VD_1, VT, VD_3 zanjiri bo‘ylab va ikkinchi yarim davri VD_2, VT, VD_4, R_{yuk} zanjiri orqali oqib o‘tadi. Boshqaruv signali o‘chirilganidan so‘ng tiristor yopiladi va yuklama tarmoqdan o‘chiriladi.

Kuch tiristori holatini boshqarish uchun VU optotiristor ishlatiladi. Optoparaning diodli zanjiri yarimo‘tkazgichli diod yordamida tarmoqda yoqiladigan kondensatorga chegaralovchi qarshilik (rezistor) R orqali ulanadi. Bunday zanjirda, kirish kuchlanishining butun davrida sig‘imdagi kuchlanish o‘zgarmas bo‘ladi.

Shunday qilib, V tumbleri berk paytida optoparaning diodli zanjiriga signal beriladi va optoparaning tiristorli qismi ochiladi. $R_{boshq.}$ qarshiligi orqali tiristorning ochilishiga impuls beriladi. $R_{boshq.}$ qarshiligining qiymatini quyidagi formula bo‘yicha aniqlansa bo‘ladi:

$$R_{бошк} = \frac{0{,}05U_m - U_{бошк}}{(1{,}1 \div 1{,}2)I_{бошк}}, \Omega$$

bu yerda: U_m – ta’minlash manbai kuchlanishining amplitudasi, V; $U_{boshq.}$ – $I_{boshq.}$ tokiga muvofiq bo‘lgan, boshqaruv elektrodi va katod orasidagi kuchlanish, V; $I_{boshq.}$ – tiristorni ochadigan boshqaruv elektrodi zanjiridagi o‘zgarmas tok, A.

Tumbler ochilgan vaqtda tiristorning boshqaruv zanjiri kontaktsiz o‘chiriladi. Tumbler funksiyasini asosan elektrik, elektromexanik yoki mexanik uskunalar bajaradi. Birinchi holda, kuchlanish, nur, harorat, bosim va boshqa ta’sir ostida ishlaydigan datchikli kichik quvvatli asosiy elektron uskunasi bo‘lishi mumkin. Shunday qilib yuklamadagi quvvatni boshqarishni signal bajaradi.

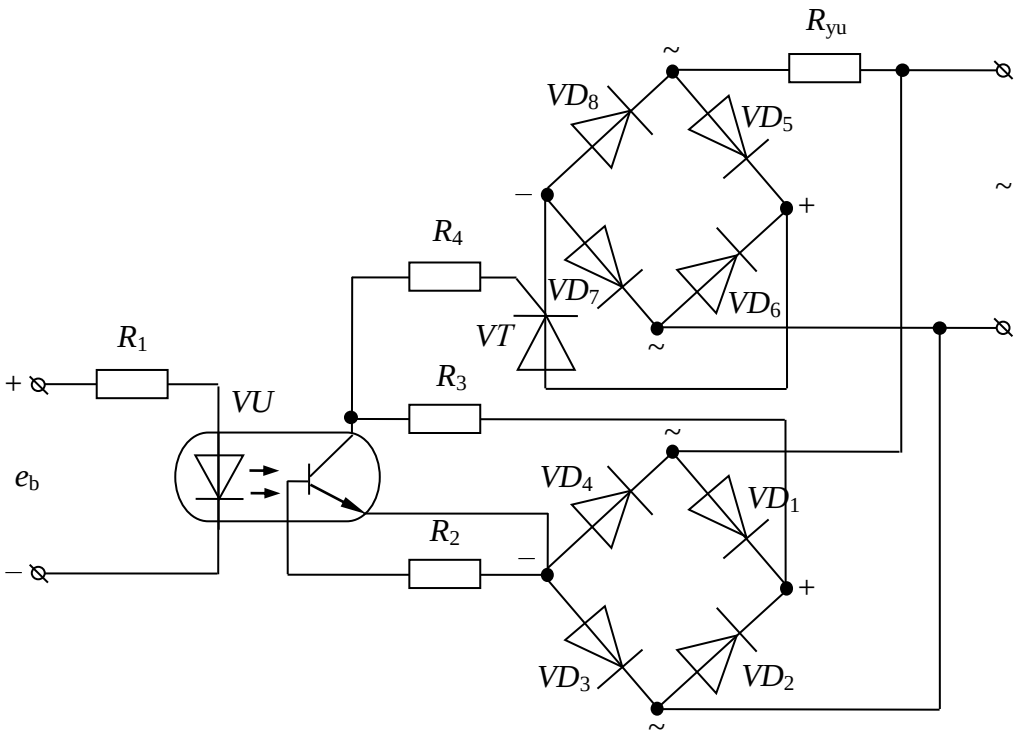
Yuklamani kontaktsiz o‘chirish sxemasi quyidagi elementlar bazasida yig‘ilgan: *KU201I* – tiristor; *D226B* – diod; R=15 Ω, $R_{yuk.}$=820 Ω va $R_{b.}$=900 Ω qiymatli qarshiliklar, C=10 mkF sig‘imli kondensator hamda *VU-AOU103V* tipli tiristorli optopara.

Optron bazasidagi 0,1 Vt quvvatli boshqaruv tizimi yordamida, 450 Vt quvvatli yuklama kommutatsiyasini bajarish mumkin. Katta tokli tiristorlarni yordamida yanada katta quvvatli yuklamalarning kommutatsiyasini bajarish mumkin.

Optotranzistorli kontaktsiz kuchlanish rele sxemasini ko‘rib chiqamiz (2-rasm). Kuchlanish relening kuch qismi, VD_2 ko‘prik sxemasida ko‘rsatilgan.

Undagi VT kuch tiristori tarmoqqa $R_{yuk.}$ yuklama orqali ulangan. VT kuch tiristorini boshqaruv zanjiri R_3, R_4 qarshiliklar va VD_1 diodli ko‘prik orqali ulangan. O‘zgarmas tok - $I_{boshq.}$, ya’ni

kirish signali yo‘q vaqtida *VU* optron fototranzistori yopiq, boshqaruv toki R_3, R_4 va *VT* elektrodining boshqaruv tiristoriga uzatiladi (kuchlanish relesini kontaktsiz yoqilganligi-ni bildiradi).



2-rasm. Optotranzistorli kontaktsiz kuchlanish rele sxemasi

$I_{boshq.}$ svetodioddan chiqqan nurlanish yordamida fototranzistor ochiladi hamda tiristorning boshqaruv toki VP_1 va R_3 zanjiri orqali o‘tadi. R_4 qarshiligi bo‘ylab kichik tok oqib o‘tadi, u *VT* tiristorining ochiq holatda bo‘lishi uchun etarli emas va tiristor yopiladi, ya’ni kuchlanish relesi kontaktsiz o‘chirilgan hisoblanadi. Kontaktsiz kuchlanish relesining sxemasi quyidagi elementar bazasida bajarilgan: *KU201I* tipli tiristor; *KS-402V* tipli diodli ko‘prik; R_1=100 Ω, R_2=510 Ω, R_3=5,1 Ω, R_4=330 Ω, R_4=820 Ω qiymatli qashiliklar va *VU-30T 110G* tipli optotiristor.

Ilmiy-tadqiqot yo‘li bilan tajribada o‘tkazilgan kontaktsiz uzgichning tashqi va rostlash xarakteristikalari hamda kuchlanish relesining yuqoridan ko‘rinishi 3-5 rasmlarda keltirilgan.

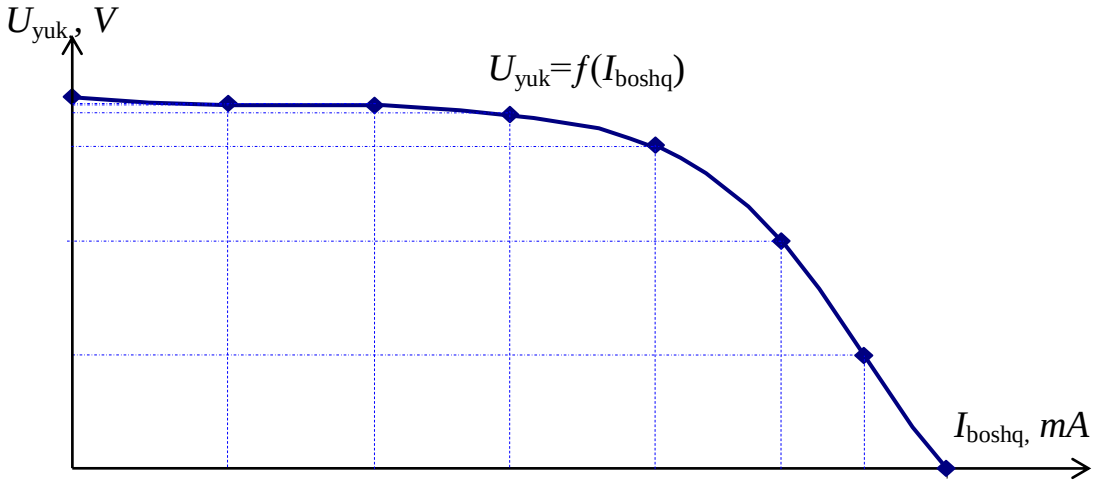
XULOSA

O‘tkazilgan ilmiy-tadqiqotlardan quyidagi natijalar keltiriladi:

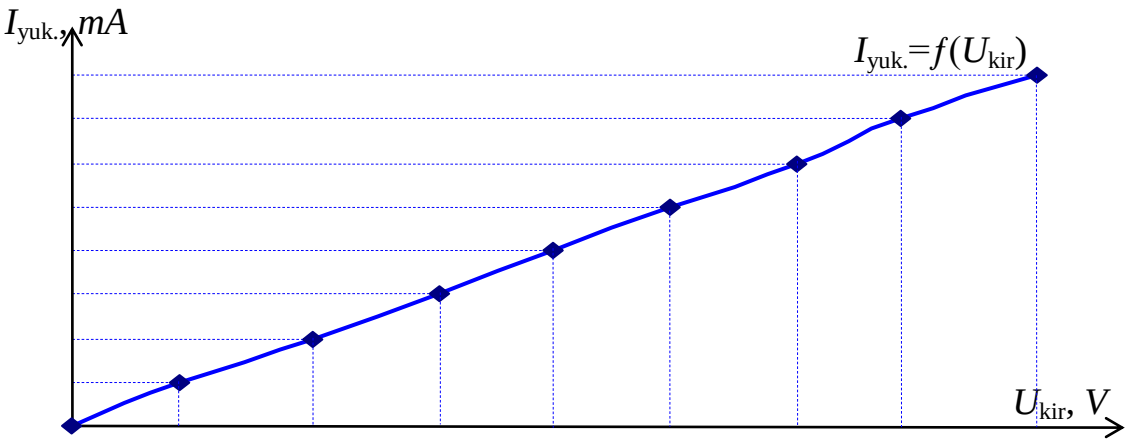
1. Elektrotexnika va elektronika sohasida kuch tiristorlarini boshqarish tizimidagi optoelektronli rezistiv zanjirlarni bir fazali statik kontaktsiz o‘chirgich sxemasi Islom Karimov nomidagi

Toshkent davlat texnika universiteti «Elektr texnikasi» kafedrasining ilmiy laboratoriyasida tajribadan o‘tkazilgan.

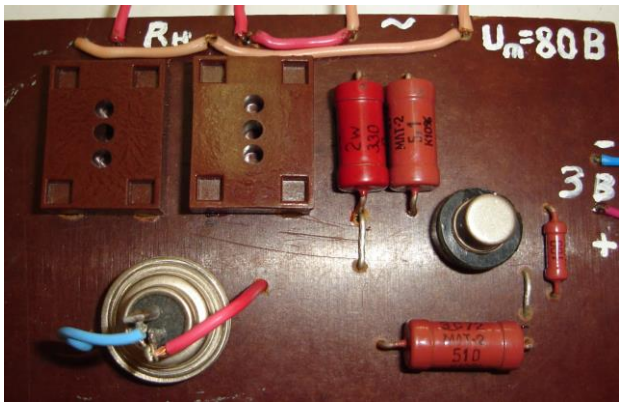
2. Yuqorida keltirilgan sxemalarning berilgan xarakteristikalaridan foydalangan holda, har xil kontaktsiz boshqarish uskunalarini yaratish mumkin.



3-rasm. Kontaktsiz uzgichning tashqi xarakteristikasi



4-rasm. Kontaktsiz uzgichning rostlash xarakteristikasi



5-rasm. Optotiristorli kontaktsiz kuchlanish relesi (*yuqoridan ko‘rinishi*)

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RECYCLED CONCRETE, CHARACTERISTICS AND SUSTAINABLE DEVELOPMENT

Nurafzal Qaytmas
Lecturer, Civil Engineering Department, Engineering Faculty, Faryab University, Afghanistan
Email: nurafzalqaytmas@gmail.com

ABSTRACT

Demolition of old buildings and their replacement with new buildings is a frequent phenomenon in a large part of the world, which leads to the generation of construction waste. Among the construction wastes are concretes, which is the most common method of managing these wastes, through their disposal in landfills. On the other hand, the production and use of concrete is increasing rapidly, which leads to the increase in the consumption of natural materials as the largest component of concrete. A possible way to solve these problems is to recycle destroyed concrete and produce alternative aggregates for structural concrete. Based on documentary studies, this article aims to introduce recycled concrete and its characteristics with a descriptive-analytical method.

Keywords: recycled concrete, properties of recycled aggregates, properties of recycled concrete, existing obstacles

Introduction

Demolition of buildings and their replacement with new buildings have different reasons. Among its main reasons can be mentioned the change of use, deterioration of the structure, change in the fabric of the city, expansion of traffic direction, natural disasters, etc.

The wastes resulting from the demolition of buildings are placed in landfills, which causes many environmental pollutions. Concrete is one of the construction wastes that can be recycled and reused. Concrete recycling is becoming a popular way to reuse leftover materials from building demolitions.

In addition to reducing environmental pollution, concrete recycling also includes reducing construction costs. Therefore, in this article, an attempt has been made to investigate the characteristics of recycled concrete as well as its advantages and disadvantages.

Research Methodology

In collecting information, library and documentary methods have been used. In this article, the successful experiences of projects implemented in other countries as well as the research of researchers have been used.

General properties of concrete with recycled materials

After the destruction of concrete, the aggregates contain a certain amount of cement paste. This mortar is the main reason for the low quality of recycled concrete compared to concrete with natural aggregates. The method of producing recycled concrete is different from the method of producing concrete with natural aggregates.

Because recycled aggregates contain cement mortar, they have higher water absorption than natural aggregates.

Therefore, in order to achieve the desired efficiency of recycled concrete, if water-reducing additives are not used, it is necessary to add a smaller amount of water to saturated aggregates compared to natural aggregates. (Nagataki etal.,2004)

Properties of aggregates

Recycled concrete materials can be prepared from the following:

1- Samples prepared for concrete testing

2- Destruction of concrete buildings

In making conventional concrete, only the cement paste surrounds the aggregates, but in recycled concrete, the aggregates may contain salt, bricks, tiles, plastics, dust, etc.

Numerous tests have shown that recycled aggregates after separation from other wastes, and sieves, can be used as a substitute for coarse aggregates.

However, checking the quality of recycled aggregates in terms of grain size distribution, friction and water absorption is particularly important. (Crentsil et al., 2001; Ajdukiewicz and Kliszczewicz, 2002)

The size of the aggregates

After sifting the aggregates and separating them, it is necessary to place the aggregates in a crusher to achieve the desired size for making concrete. It is generally accepted that recycled aggregates, both coarse and fine aggregates, are obtained from impurities by crushing once and twice. In order to achieve the right size, larger aggregates are placed in successive crushers.

The best aggregates size is obtained by using the first and then the second crushing, but from an economic point of view, the first crushing is more suitable. In the initial crushing stage, the size of the grains is reduced to about 50 mm, and on the way to the second stage, electromagnetism is used to remove metal materials. The second crushing step reduces

the particle size to about 14-20 mm. Necessary care should be taken during crushing, because finer materials are produced than in the initial stage and concrete crushing stage. (Corinaldesi et al., 2002)

Friction

There is little information about the friction of aggregates. In countries such as the United States and the United Kingdom, recycled aggregates are used in road surface layers. However, the studies conducted show promising results about the use of recycled aggregates in sub-base layers in flexible pavements. (Gilpin et al., 2004; Khalaf et al.,2004)

Absorption

Recycled aggregates have very high water absorption compared to natural aggregates. This high absorption is caused by the porosity caused by the binding of the mortar to the aggregates. Water absorption in coarse aggregates can be considered as about 3-12% of natural aggregates, and these percentages depend on the type of cement used to produce aggregates. (Katz,2003;Rao, 2005)

Properties of hardened recycled concrete

Compressive strength

Although researchers have reported a reduction in strength in recycled concrete, it should be noted that the amount of strength reduction depends on parameters such as the type of cement used to make recycled concrete, the water per cement ratio, and the moisture conditions of recycled aggregates, etc. has it. For example, in the Katz test, it was found that at a high water per cement ratio (between 0.6 and 0.75), the strength of recycled concrete is about 75% of normal concrete. (Katz, 2003)

In Rao's test, it was also found that the strength of recycled concrete can be considered equal to normal concrete, with the condition that the ratio of water per cement ratio is higher than 0.55.

Rao also showed that if the water per cement ratio is reduced to 0.4, the strength of recycled concrete will be only about 75% of normal concrete. (Rao, 2005)

Apart from the water per cement ratio, the moisture conditions of the aggregates also have a significant effect on the compressive strength. (Rao,2005; Poon et al., 2004)

Creep and shrinkage

Recycled concrete has high shrinkage due to the high absorption of its aggregates. Studies show that the shrinkage of recycled concrete on the 90th day is about 0.55mm/m to 0.80mm/m. While the acceptable amount of shrinkage in normal concrete is around 0.30

mm/m. Laboratory results for creep are not completely clear, even some studies have shown opposite results, for example, in an experiment, creep in recycled concrete is reported to be about 20% less than normal concrete after 1 year. (Ajdukiewicz and Kliszczewicz, 2002) It seems that recycled concrete and conventional concrete will be comparable when the simultaneous effect of creep and shrinkage is considered.

Modulus of elasticity

The modulus of elasticity for recycled concrete is reported to be about 50-70% of normal concrete, depending on the water per cement ratio. (Oliveira et al., 1996)

Bending and tensile strength

Studies conducted by Rao show a reduction in strength of about 15-20% of normal concrete. In another study, where only the tensile strength of concrete was investigated, the difference in the tensile strength of recycled and normal concrete at day 28 was reported to be less than 20%. **(**Ajdukiewicz and Kliszczewicz, 2002**)** Studies have shown that the use of admixtures such as microsilica, etc. helps to improve the properties of recycled concrete.

Comparison of recycled concrete with concrete with natural aggregates

- Increase water absorption

-Increasing the amount of organic impurities (if the concrete is in contact with the ground during its life

-Decrease of compressive strength

-Increase creep

-Decrease the modulus of elasticity

- Specific weight loss

- Reducing friction resistance

Properties of fresh recycled concrete

Many researchers have reported lower workability for recycled concrete than conventional concrete with the same amount of water. In order to improve efficiency, special measures have been proposed regarding changing the moisture content of recycled aggregates. (Topcu and Sengel,200) Recycled concrete contains more air (about 4% to 5.5%) than conventional concrete. This extra air can be attributed to the greater porosity of the aggregates. (Katz, 2003)

The density of most concrete made with natural aggregates is 2400 kg/m3, while the density of concrete made with recycled aggregates is less than 2150 kg/m3. One of the reasons for reducing the density of recycled concrete is the presence of excess air in this type of concrete. (Topcu and Guncan, 1995; Katz, 2003)

Obstacles to using recycled concrete

People's lack of trust in the use of recycled materials due to inappropriate culture, as well as the low prices of materials in developing countries are obstacles for recycling operations, and the only thing that can convince manufacturers or owners to recycle waste is imposing Landfill costs. These issues can all hinder the promotion of the use of recycled aggregates in concrete.

Lack of government support

Unfortunately, there is a lack of government support for the development and progress of the recycling industry in developing countries, but the motivation for collecting information and documenting them and consequently controlling the management of recycled materials can be realized with the existence of a suitable policy in the legal framework.

Lack of knowledge

One of the factors that cause the continuation of landfilling is people's lack of awareness of the benefits of recycling, as well as their lack of awareness of the consequences of the absolute use of freshly mined aggregates. To overcome these barriers, we need to raise awareness and disseminate information about the consequences of repeated use of quarry aggregates as well as the characteristics of recycled concrete to stimulate public opinion towards recycled materials. We can also create space for the growth of recycled materials by participating and pushing the construction industry to use recycled materials in projects.

Lack of appropriate technologies

The methods or technologies of eliminating wastes on an economic scale should have high speed and low cost. However, regarding concrete recycling, there are few feasible technologies.

Absence of appropriate codes and standards

Regarding the use of recycled materials, except RILEM and JIS (RILEM, 1994) and what is used in Hong Kong, there are a limited number of standards and codes.

In Hong Kong, for common applications, except for water protection buildings, the use of 100% recycled aggregates is allowed for low-grade concrete, but for high-grade concrete, only 20% of the aggregates can be used from recycled aggregates.

In Japan, JIS pursues a program entitled Recycled Concrete with Recycled Aggregates, which promotes the use of recycled concrete.

Expanding the standards related to recycling and reuse of aggregate, in addition to providing specific goals for the producer,

also provides the consumer's confidence about the quality of concrete.

Conclusion

The production of solid waste is the product of various human activities, which today has changed a lot with the change of lifestyle and comprehensive development compared to the past.

One of the solid waste materials is building waste, which is increasing in volume day by day.

Due to the limitation of natural resources and environmental protection, the most optimal solution is to reuse waste.

The use of recycled grains in concrete is a promising solution to solve the problem of construction waste management.

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ВНЕДРЕНИЕ НОВОГО СОРТА МАША «БАРКАРОР» НА ОСНОВЕ ИСПОЛЬЗОВАНИЯ КОМПЛЕКСА ИННОВАЦИОННЫХ РЕСУРСОВ СБЕРЕГАЮЩИХ ТЕХНОЛОГИЙ

Сафар Менгликулович Аликулов
Файзулла Хабибуллаевич Абдуллаев
Хусниддин Габтрашидович Мансуров
Мухиддин АбсаматовичАлияров
д.с/х.н., с.н.с.
Научно-исследовательский институт генетических ресурсов растений

Юлия Илларионовна Широкова
к.с/х.н., с.н.с.
Научно-исследовательский институт ирригации и водных проблем

АННОТАЦИЯ

В статье представлены сведения о проводимой исследований по внедрению (*адаптации*) в условиях Ферганской долины двух отечественных инновационных разработок: интенсивного сорта маша Баркарор» и водо- и ресурсосберегающих технологий мелиорации почв и защиты растений, обеспечивающих благоприятные условия для получения потенциального урожая без потерь в рамках проекта EU-AGRIN в сотрудничестве с ПРООН и МСХ РУз финансируемой ЕС.

Ключевые слова: маш, отчественные научные разработки, водо-почворесурсовсберегающие технологии, микроюиопрепараты, инновационная группа, внедрение в производство, демонстртационные участки, семинар-тренинги.

ABSTRACT

The article presents information about the ongoing research on the implementation (*adaptation*) in the conditions of the Ferghana Valley of two domestic innovative achievements: the intensive variety of bean «Barkaror» and water- and resource-saving technologies for soil reclamation and plant protection, providing favorable conditions for obtaining a potential harvest without loss within the framework of EU-AGRIN project in cooperation with UNDP and the Ministry of Agriculture of the Republic of Uzbekistan funded by the EU.

Keywords: mung-bean, domestic scientific achievements, water and soil resources saving technologies, microbiological preparations, innovation group, implementation in production, demonstration plots, seminar-trainings.

ВВЕДЕНИЕ

С учетом глобальных угроз изменения климата, в мире актуальны проблемы продовольственной безопасности и рационального использования природных, в т.ч. водно-земельных ресурсов.

В развитых странах разработаны некоторые водо- и почвосберегающие технологии. Однако для достижения поставленных целей, в проекте будут использованы отечественные научные разработки и технологии, которые являются инновационными, относительно недорогими и доступными для местных землепользователей, за счёт производства семенного материала и препаратов в республике.

Высокий рост и плотность населения в Ферганской долине Узбекистана (*в 2022 году всего в долине- 7 млн. и Ферганской области 3,9 млн. чел.*), вызывает необходимость наращивания производства продуктов питания, широко применяемых в регионе, в т.ч. в Ферганской долине с использованием экологически безопасных препаратов, обеспечивающих экологически чистую продукцию. В регионе распространены почвы с неблагоприятными свойствами (*гипсированность, уплотненность, засоленность и др.*), требующие ресурсосберегающих мелиоративных мероприятий для получения высоких урожев сельскохозяйственных культур.

Цель исследований заключается во внедрении (*адаптации*) в условиях Ферганской долины двух отечественных инновационных разработок: интенсивного сорта маша «Баркарор» и водо- и ресурсосберегающих технологий мелиорации почв и защиты растений, обеспечивающих благоприятные условия для получения потенциального урожая без потерь. Данный проект направлен на обеспечение населения Республики Узбекистан продовольствием и, соответственно- социальной стабильности страны, а также и на рациональное использование водных и земельных ресурсов. Исследования проводятся инновационной группой «Зернобобовые культуры в Ферганской области» по проекту «Внедрение нового сорта маша «Баркарор» при использовании интегрированных инновационных технологий управления земельно-водными ресурсами» в рамках проекта «Поддержка инклюзивного перехода агропродовольственного сектора к «зеленой экономике» и развитию климатоориентированной системы сельскохозяйственных знаний и инноваций (ЕС-АГРИН)» в сотрудничестве с ПРООН и МСХ РУз, финансируемой Европейским Союзом.

В документах по зеленой экономике подчеркиваются совместное использование, циркулярность, сотрудничество,

солидарность, устойчивость, возможности и взаимозависимость. Все эти вопросы отражаются в намечаемом исследований, который представляет собой комплексное, интегрированное сочетание технологий, решающих задачи: 1) обеспечение населения экологически чистой продовольственной продукцией, производимой с помощью биотехнологий (*уникальные отчественные биопрепараты, улучшающие почвы, новые экологически безопасные препараты для защиты растений*); 2) рациональное использование водно-земельныых ресурсов при мелиорации неблагоприятных почв, применение водосберегающих технологий для расоления почв; 3) улучшение свойств почв, наращивание плодородия почв (*содержания в почве органического вещества и азота*) за счет выращивания культуры маш и использования (*запахивания*) растительных остатков, содежащх азот.

Проблема является очень важной также с точки зрения использования научного потенциала республики. Инновационная группа представляет собой команду высококвалифицированных специалистов по нескольким направлениям (*объединённых общей целью- повышение производства важной культуры маш, поднятия продуктивности земель, путем улучшения и сохранения здоровья почвы и рационального использования воды*). Это позволит реализовать внедрение инновационных технологий в фермерском хозяйстве и даст старт к дальнейшему распространению комплексных технологий выращивания нового перспективного сорта маша, с созданием условий получения потенциального урожая.

МАТЕРИАЛЫ И МЕТОДОЛОГИЯ

В исследованиях использовались нижеследующие научные инновационные отечественные разработки:

1. Новый сорт маша «Баркарор» интенсивного типа, разработан в Научно-исследовательском институте генетических ресурсов растений. В 2019 году сорт включен в Государственный реестр как перспективный сорт. На сорт получен патент (*NAP 00380, 31.01.2022*) Агентства по интеллектуальной собственности. Сорт скороспелый, первые стручки созревают через 50 дней после всходов. Срок массового созревания 75 дней. Куст растения штамбового типа, высота растения 65,0 см. Бобы образуются в верхней части стебля (*25-30 шт.*). Растение формирует 40 и более стручков. Цвет бобов коричневый. В каждом бобе образуется 8-9 семян. Семена крупные, масса 1000 семян 87-91 г, оливкового цвета, блестящие. Урожайность зерна- 24,0-25,0 т/га, урожайность зеленой

массы 180,0-200,0 т/га. Пригоден для механизированной уборки. Экспортный потенциал- высокий. Пригоден к весенним и летним срока посадки и получения полноценного урожая.

2. Инновационная технология использования отечественного препарата-мелиоранта засоленных почв «Биосолвент» (*создан и запатентован в Институте биоорганической химии АН РУз*), разработана в Научно-исследовательском институте ирригации и водных проблем путем детальных исследований в лабораторных и полевых условиях. Установлено, что при средней степени засоления почвы, обработка её препаратом перед подачей воды, позволяет усилить выщелачивание солей и экономить воду: при промывке на 40% (*2000 м^3/га*), а при поливе 25% (*1000 м^3/га*). Регулирование солевого режима почвы в период вегетации дает прибавку урожая.

3. Новые микробиологические препараты, не имеющие аналогов в мире: бактериальное удобрение комплексного действия «TERIA-S» (*в развитие группы прежних препаратов «Ризаком-1»*)- для улучшения почвы и «Serhosil-2»- для усиления роста и развития растений, разработаны специалистами-микробиологами (*д.б.н., проф. Джуманиязова Г.*) уже испытаны на зерновых культурах и дают прибавку урожая до 25% против обычных технологий выращивания.

4. Новые эффективные препараты- фунгициды для защиты растений против фузариозных заболеваний позволяют защитить урожай зерновых культур со дня посева семени в землю до его произрастания. Попадание фунгицида в землю, защищает окружающую среду. Обработка семян перед засеванием фунгицидами «Виал», «Геркулес», «Раксил» очищает семена от вредной микрофлоры, положительно влияет на хранение и произрастание.

Все применяемые в проекте инновационные технологии закреплены патентами и прошли испытания в различных регионах Узбекистана и разных видах культур.

Инновационная группа включает 3 научных организаций: НИИ генетических ресурсов растений, Научно-исследовательский институт ирригации и водных проблем, Ферганская опытная станция НИИ зерновых и зернобобовых культур и фермерское хозяйство «Best Cotton Fields» Дангаринского района Ферганской области. Для организации демонстрационного участка фермером представлен поле с площалью 5,0 га.

РЕЗУЛЬТАТЫ И ОБСУЖДЕНИЕ

Проводимые исследования является важной для Узбекистана. В первую очередь, потому что она направлена при производстве продуктов питания для интенсивно растущего населения республики. Она также очень важна с точки зрения экономного использования повышение продуктивности воды и земельных ресурсов при сельскохозяйственном производстве. Реализация данного проекта будет являться примером интегрированного управления водно- земельными ресурсами в сельском хозяйстве, с применением экологически безопасных, биологических и ресурсосберегающих технологий мелиорации почв, земледелия и защиты растений.

В рамках исследований ноый сорт маша «Баркарор» интенсивного сорта предполагается производить в качестве повторной культуры в фермерских хозяйствах, а также в дехканских и на приусадебных участках. Данная культура имеет также экспортный потенциал.

В результате исследований ожидается максимальная прибавка урожая маша в фермерском хозяйстве (*до 1,5 т/га*) и получения фермерами прибыли (*более 3000 долларов США*), за счет внедрения комплекса мероприятий (*интегрированного воздействия на продуктивность почвы, защиты растений*), с помощью экологически чистых и доступных фермеру технологий (*локальное производство компонентов биопрепаратов и химикатов, семян и др.*). Прибавка органического вещества в почве за счет запахивания растительных остатков маша (*до 0,5%*) будет способствовать устойчивому земледелию, снижение затрат удобрений на 20%. Ожидается повышение уровня знаний и освоение новых технологий земледелия и более 300 фермерами. Площадь под бобовыми культурами в Ферганской области, которая на сегодня составляет 5 327 га будет увеличена, предположительно, на 30%.

Поскольку инновационная группа представляет собой команду высококвалифицированных специалистов по нескольким направлениям внедрение инновационных комплексных технологий выращивания нового перспективного сорта маша технологий в фермерском хозяйстве позволит фермерам получение новые знания, консультации и наглядно увидеть результаты воздействий новых технологий на почве и урожай. В социальном плане, демонстрация технологий повлияет на понимание фермерами биологического земледелия, ресурсосбережения, рационального использования водных и земельных ресурсов, применения биологических методов защиты растений и почв, наращивание плодородия. Также работа в команде, обсуждение на семинарах и в СМИ,

поднимет социальную значимость внедряемых технологий, подходящих к понятию «зеленой экономики» и адаптации к изменению климата.

Систематизации и оценка инноваций, выявление эффективности по отдельным элементам и их адаптация к местным условиям, будут выполнены на основе проверки предложенных технологий в полевых условиях на территории фермерского хозяйства. Мониторинг внедрения будет осуществляться на научной основе со строгим соблюдением регламента инновационных технологий.

В первый год исследований будет проведена демонстрация комплекс инновационных технологий на территории фермерского хозяйства с проведением семинаров по технологиям согласно графика сельхоз работ (*посев, полив, промывка, обработка почвы и растений и др.*). Во второй год исследований будет проведена адаптация технологий к условиям Ферганской области (*уточнение показателей эффективности по отношению к ожидаемым*). Проведение демонстрационных семинаров с волечением СМИ, местных властей и фермеров Бешарыкского и других районов Ферганской области.

В результате исследований планируется достичь поставленной цели на каждом этапе внедрения в производство научных разработок и технологий. В первый год исследований предусмотрено:

1. Выбор участка и разбивка делянок под варианты отдельных технологий и их сочетание.
2. Почвенное обследование полевого участка (*уплотненность, засоленность почвы, фильтрационные свойства, показатели плодородия, содержание гумуса, NPK. и др.*).
3. Проведение необходимых сельскохозяйственных операций в период вегетации, в т.ч. основных, а также предусмотренных инновационными технологиями (*обработка семян маша биопрепаратами перед посевом, обработка почвы и растений "Триходерминoм", обработка почвы перед поливом препаратом "Биосольвентом"*).
4. Мониторинг подачи воды для полива, роста и развития растений, засоления почвы до и после каждого полива.
5. Организация демонстрационных семинар-тренингов для фермеров.

Демонстрационный участок будет разделен на отдельные делянки на каждой из которых будет испытываться: а) по одной технологии; б) по две технологии; в) по три технологии и г) все технологии. На каждом вышеуказанном варианте

демонстрации будет проведены все необходимые мепроприятия по технологиям, а также общепринятая агротехнология сельхозяйственных работ. Вариант без каких-либо инноваций, с посевом обычного местного сорта маша (*практика фермера*), будет служить контролем. На все вариантах будет проводится мониторинговые наблюдения.

Работа будет проводиться на дествующем полевом участке фермера, будут выдержаны все агротехнорлогическими мепроприятия, предусмотренными технологическими картами культуры. Режимы поливов и внесения удобрений на контрольном варианте, будут полностью соотвествовать принятой практике. Соседние фермеры могут свободно ознакомиться с проводимыми мероприятиями по инновационным технологиям.

Фермером будет предоставлено поле под демонстрацию технологий и проводит все агротехнологические операции сельхозяйственных работ (*вспашка, рыхление почвы, полив, промывки, посев, внесение удобрений, прополка, культивация и др.*) на всех вариантах демонстации, при участии партнеров из инновационной группы проекта.

Обучение фермеров предполагается проводить на демонстационных семинар-тренингах по этапам сельскохозяйствнных работ, с учетом инноваций (*посев культур с замачиванием семян маша биопрепаратами, орошение, применение "Триходермина", промывка земель, результаты по урожаю в вариантах демостраций*). В Ферганской области будет создан консультативный пункт, где будут демонстрироваться полевой участок и материалы (*буклеты, флайеры, рекомендации и т.д.*) по всем используемым технологиям и созданные партнерами видеофильмы о внедрении отдельных и комплексных инновационных технологий.

В рамках проводимых работ определены обязанности партнеров. Научно-исследовательский институтом генетических ресурсов растений будет осуществлен общее руководство проектом и обеспечение реализации в части внедрения нового сорта маша, управление бюджетом проекта, а также организация обеспечения семенами и посева нового сорта маша, соблюдение агротехнологии выращивания, с учетом реализации комплексных инновационных технологий, учет урожая. Научно-исследовательский институтом ирригации и водных проблем будут проведены почвенные исследования, мониторинг орошения и солевого режима орошаемых почв с применением препарата «Биосолвент» и проведение соответствующих мероприятий; выбор и разбивка вариантов на местности, обследование почв участка; отбор проб и

лабораторные анализы почвы; влагозарядка почвы, реализация инновационных технологий по обработке почвы препаратами в увязке с поливами, а также мониторинг орошения и состояния почв. Ферганская опытная станция Научно-исследовательского института зерновых и зернобобовых культур организует совместно с фермером работу по проведению агротехнических мероприятий, связь с общественностью и СМИ, организация демонстрационных семинар-тренингов и фермерских школ. Фермерским хозяйством «Best Cotton Fields» Дангаринского района Ферганской области будет предоставлено поле с площадью 5,0 га под демонстрацию технологий, им будет проведено всех агротехнологические операции сельхозяйственных работ (*вспашка, рыхление почвы, полив, промывки, посев, внесение удобрений, прополка, культивация и др.*) на всех вариантах демонстации с участинм партнеров.

ВЫВОДЫ

Широкая коммерциализация результатов исследований возможна, за счет того, что внедрение будет проводиться на территории фермерского хозяйства «Best Cotton Fields» Дангаринского района Ферганской области, которой, по итогам внедрения инноваций, будут производится адаптированные сорта маша с применением ряда технологий по защите растений и почв, способствующих получению потенциального урожая. Будут подготовлены документы, необходимые для коммерцилизации. Масштабы коммерциализации на первом этапе, - вся Ферганская долина.

Эффективность используемых инновационных научных разработок и технологий заключается в применении экологичных методов повышения плодородия почвы и борьбы с болезнями, в результате которой достигается в экономии воды на 30% и получении прибавки урожая нового сорта маша «Баркарор» против обычных технологий на 1,5 т/га и увеличении производства продукции на 20%.

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RESEARCH AROUND ONE WEAK SOLUTION FOR SPECIAL OPERATOR IN VARIABLE EXPONENT SPACES

Yalda Elbegi
Department of Mathematics, Faculty of Education, Jawzjan University
E-mail: yalda.elbegi1212@gmail.com

ABSTRACT

We prove the existence of one weak solution for the fourth-order problem involving the special operator in variable exponent spaces. The proof of our main result uses variational methods.

This-type problems are used to describe a large class of physical phenomena Such as micro-electro-mechanical systems, phase field models of multiphase Systems, thin film theory, thin plate theory, surface diffusion on Solids, interface dynamics, and also flow in Hele–Shaw cells. That is why many authors have looked for solutions of elliptic equations involving such operators**.**

Keywords: one weak solution, variable exponent Sobolev space.
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Introduction

In this article, we show the existence of one weak solution for the following Fourth-order problem involving the special type operator

$$\begin{cases} \Delta(a(x,\Delta u) = \lambda|u|^{p-2}u & \text{in } \Omega, \\ u = 0 & \text{on } \partial\Omega, \end{cases} \qquad (1,1)$$

Where Ω is a bounded domain in $\mathbb{R}^N (N \geq 2)$ with a smooth boundary $\partial\Omega$, $\lambda > 0$ is a parameter, u is a Carathéodory function, $p \in C(\overline{\Omega})$ satisfies the inequality

$$\inf_{x\in\Omega} > \frac{N}{2} \qquad \text{for all} \qquad x \in \Omega,$$

And $\Delta(a(x,\Delta u)$ is the special operator of the fourth-order, where a satisfies a Set of conditions.

We assume that the $a: \overline{\Omega} \times \mathbb{R} \to \mathbb{R}$ satisfy the following conditions:

(F1) a is a Carathéodory function such that $a(x; 0) = 0$, for a. e. $x \in \overline{\Omega}$.

(F2) There exist $c_1 > 0$, such that

$$|a(x,t)| \leq c_1\left(1 + |t|^{p(x)-1}\right), \quad \text{for a. e } x \in \Omega \text{ and } t \in \mathbb{R}$$

(F3) For all $s; t \in \mathbb{R}$, the inequality $|a(x; t) - a(x; s)|(t - s) \geq 0$ holds, for a. e. $x \in \Omega$.

(F4) There exists $c_2 \geq 1$ such that

$$c_2|t|^{p(x)} \leq \min\{a(x,t)t, p(x)A(x,t)\}, \quad \text{for a.e. } x \in \Omega \text{ and all } t \in \mathbb{R},$$

Where $A: \bar{\Omega} \times \mathbb{R} \to \mathbb{R}$ represents the anti-derivative of a, that is,

$$A(x,t) = \int_0^t a(x,s)\, ds$$

Assume conditions (F1) − (F4) hold, then we have

(I) $A(x,t)$ is a C^1-Carathéodory function, i.e. for every $t \in \mathbb{R}$, $A(\cdot, t): \Omega \to \mathbb{R}$ is measurable and for a.e. $x \in \Omega$, $A(x, \cdot)$ is $C^1(\mathbb{R})$.

(II) There exists a constant c_3 such that

$$|A(x,t)| \leq c_3\left(|t| + |t|^{p(x)}\right), \quad \text{for a.e } x \in \Omega \text{ and all } t \in \mathbb{R}.$$

Details about this kind of operators the reader is referred to [4, 9, 10].
Investigations of this type of operators has been going on in various fields,
e.g. in electro rheological fluids (see [13]), elasticity theory (see [15]), stationary thermo rheological viscous flows of non-Newtonian fluids (see [1]), image processing (see [5]), and mathematical description of the processes

filtration of bar tropic gas through a porous medium (see [2]), For more details about this kind of operators the reader is referred to Leray and Lions [10].
For the reader's convenience, we recall some background facts concerning
the variable exponent Lebesgue and Sobolev spaces with variable exponent and introduce some notation. For more details, we refer the reader to [6, 7, 8, **9**, 11, **12**] and the references therein. Set

$$C_+(\bar{\Omega}) := \{h \in C(\bar{\Omega}): h(x) > 1, \quad \text{for all } x \in \bar{\Omega}\}.$$

For every $p \in C_+(\bar{\Omega})$,

$$1 < p^- := \min_{x \in \bar{\Omega}} p(x) \leq \max_{x \in \bar{\Omega}} p(x) < +\infty$$

We define the variable exponent Lebesgue space

$$L^{p(\cdot)}(\Omega) := \left\{u : \Omega \to \mathbb{R} \text{ measurable and } \int_\Omega |u(x)|p(x)dx < \infty\right\},$$

Which is a separable and reflexive Banach space under the Luxemburg norm,

$$\| u \|_{Lp(\cdot)(\Omega)} = \inf\left\{\mu > 0: \int \left|\frac{u(x)}{\mu}\right|^{p(x)} dx \leq 1\right\}.$$

For every $k \in \mathbb{N}$, we define the variable exponent Sobolev space by

$$W^{k,p(\cdot)}(\Omega) := \left\{u \in L^{p(\cdot)}(\Omega) : D^{\alpha}u \in L^{p(\cdot)}(\Omega), \quad |\alpha| \leq k\right\},$$

The space $W^{k,p(\cdot)}(\Omega)$ equipped with the norm

$$\| u \|_{W^{k,p(\cdot)}(\Omega)} := \sum_{|\alpha| \leq k} \| D^{\alpha}u \|_{L^{p(\cdot)}(\Omega)},$$

Is a separable and reflexive Banach space, too. Now, we introduce $W_0^{k,p(\cdot)}(\Omega)$ as the closure of $C_0^{\infty}(\Omega)$ in $W^{k,p(\cdot)}(\Omega)$. In the sequel, X will denote the space $W^{2,p(\cdot)}(\Omega) \cap W_0^{1,p(\cdot)}(\Omega)$, which is a reflexive Banach space respect to the norm

$$\begin{aligned}\| u \|_X &:= \| u \|_{W^{2,p(\cdot)}(\Omega)} + \| u \|_{W_0^{1,p(\cdot)}(\Omega)} \\ &= \| u \|_{L^{p(\cdot)}(\Omega)} + \| \nabla u \|_{L^{p(\cdot)}(\Omega)} + \sum_{|\alpha| = k} \| D^{\alpha}u \|_{L^{p(\cdot)}(\Omega)}.\end{aligned}$$

Proposition 1.1. [14] Assume that Ω is a bounded domain with Lipchitz Boundary. The norms $\|\cdot\|_X$ and $\| \nabla u \|_{L^{p(\cdot)}(\Omega)})$ are equivalent on $W^{2,p(\cdot)}(\Omega) \cap W_0^{1,p(\cdot)}(\Omega)$.

$$\|u\| = \inf\left\{\mu > 0: \int_{\Omega} \int \left|\frac{u(x)}{\mu}\right|^{p(x)} dx \leq 1\right\}.$$

Proposition 1.2. [7] Suppose $\frac{1}{p(x)} + \frac{1}{p^*(x)} = 1$, then $L^{p(\cdot)}(\Omega)$ and $L^{p^*(\cdot)}(\Omega)$ are conjugate space, and satisfy the Hölder-type inequality:

$$\left|\int_{\Omega} u(x)v(x)\,dx\right| \leq \left(\frac{1}{p^-} + \frac{1}{(p^*)^-}\right)|u|_{p(\cdot)}|v|_{p^*(\cdot)} \leq 2|u|_{p(\cdot)}|v|_{p^*(\cdot)},$$

Where $p^- := \inf_{x\in\bar{\Omega}} p(x)$ and $(p^*)^- := \inf_{x\in\bar{\Omega}} p^*(x)$.

Proposition 1.3. [7] Set $\rho(u) := \int_{\Omega} |\Delta u|^{p(x)}\,dx$. For every $u, u_n \in W^{2,p(\cdot)}(\Omega)$, we have

(1) $\| u \| < (=;>)1 \Leftrightarrow \rho(u) < (=;>)1,$

(2) $\min\{\| u \|^p; \| u \|^{p^+}\} \leq \rho(u) \leq \max\{\| u \|^p; \| u \|^{p^+}\},$

(3) $\| u_n \| \to 0 (\to \infty) \Leftrightarrow \rho(u_n) \to 0 (\to \infty)$:

Remark 1.1. [11] Let $p \in C_+(\bar{\Omega})$ satisfies $p^- > \frac{N}{2}$. Then there exist a continuous embedding $X, \hookrightarrow W^{2,p^-}(\Omega) \cap W_0^{1,p^-}(\Omega)$and a compact embedding $W^{2,p^-}(\Omega) \cap W_0^{1,p^-}(\Omega) \hookrightarrow C^0(\bar{\Omega})$, such that X is compactly embedded in $C^0(\bar{\Omega})$ and $|u(x)| < K \| u \|$, where K is a positive constant.

Before proving the result, we recall the following multiple critical points theorem of G. Bonanno [3] which can be regarded as supplements of the variational principle of Ricceri [12] which is our main tools.

Theorem 1.1. Let X be a reflexive real Banach space, let $\Phi, \Psi : X \to \mathbb{R}$
Be two Gateaux differentiable functional such that Φ is strongly continuous,
Sequentially weakly lower semi-continuous, and coercive, and Ψ is sequentially weakly upper-semi-continuous. For every $r > \inf_X \Phi$, let

$$\varphi(r) := \inf_{u\in\Phi^{-1}(-\infty,r)} \frac{\left(\sup_{v\in\Phi^{-1}(-\infty,r)}\Psi(v)\right) - \Psi(u)}{r - \Phi(u)},$$

$$\gamma = \lim_{r\to+\infty} \inf \varphi(r), \qquad \delta := \lim_{r\to(\inf_x \Phi)} \inf \varphi(r).$$

Then the following properties hold:

(a) For every $r > \inf_X \Phi$ and every $\lambda \in (0, \frac{1}{\varphi(r)})$ the restriction of the functional $I_\lambda : \Phi - \lambda\Psi$ to $\Phi^{-1}(-\infty,$

r) admits a global minimum, which is a critical point (local minimum) of I_λ in X.

(b) If $\gamma < +\infty$ then, for each $\lambda \in (0, \frac{1}{\gamma})$, the following alternative holds: either

(b1) I_λ possesses a global minimum, or

(b2) there is a sequence $\{u_n\}$ of critical points (local minima) of I_λ

$$\lim_{n\to+\infty} \Phi(u_n) = +\infty.$$

(c) If $\delta < +\infty$ then, for each $\lambda \in (0, \frac{1}{\delta})$, the following alternative holds: either

(c1) there is a global minimum of Φ that is a local minimum of I_λ, or

(c2) there is a sequence $\{u_n\}$ of pairwise distinct critical points (local minima) of I_λ that weakly converges to a global minimum of Φ with

$$\lim_{n\to+\infty} \Phi(u_n) = \inf_X \Phi$$

Definition 1.1. We say that $u \in X \setminus \{0\}$ is a weak solution of problem (1.1) if $\Delta u = 0$ on $\partial\Omega$ and

$$\int_\Omega a(x, \Delta u)\Delta v dx - \lambda \int_\Omega f(x, u)v dx = 0, \quad \text{for all } v \in X.$$

Define the functionals $\Phi, \Psi : X \to \mathbb{R}$, by

$$\Phi(u) = \int_\Omega A(x; \Delta u)dx \text{ and } \Psi(u) = \int_\Omega F(x; u)dx,$$

and set

$$I_\lambda(u) = \Phi(u) - \lambda\Psi(u), \qquad \text{for all } u \in X.$$

Proposition 1.4. ([4]). The functional $\Phi: X \to \mathbb{R}$ is coercive and mapping $\Phi' : X \to X^*$ is a strictly monotone homeomorphism.

Proof. From Proposition 1.3 and hypothesis (F4) that for $u \in X$ with $\| u \| > 1$,

$$\Phi(u) \geq \int_\Omega \frac{c_2}{p(x)} |\Delta u|^{p(x)} dx \geq \frac{1}{p^+} \rho(u) \geq \frac{1}{p^+} \| u \|^{p^-}$$

So, Φ is coercive. Φ' is strictly monotone see proof in [4].
Furthermore, $\Psi' : X \to X^*$ is compact operator, Indeed, it is enough to show That Ψ' is strongly continuous on X. For this, for fixed $u \in X$, let $u_n \rightharpoonup u$ in X. Remark 1.1 asserts that u_n converges uniformly to u on Ω as $n \to +\infty$. Since f is a Carathéodory function then $f(x, u_n) \to f(x, u)$ strongly as $n \to +\infty$, from Which follows $\Psi'(u_n) \to \Psi'(u)$ strongly as $n \to +\infty$. Then we have that Ψ' is Strongly continuous on X, which implies that Ψ' is a compact operator.

Existence of weak solution

Theorem 2.1. For every λ small enough, i.e.

$$\lambda \in \left(0, \frac{c_2}{p^+ K^{p^-}} \sup_{\gamma>0} \frac{\gamma^{p^-}}{\int_\Omega \sup_{|t|\le\gamma} F(x; u)dx}\right),$$

Where K is the constant defined in Remark 1.1, the problem (1.1) admits at least one weak solution $u_\lambda \in X$.

Proof. Our aim is to apply the part (a) of Theorem 1.1 to the problem (1.1).
Let us pick

$$0 < \lambda < \frac{c_2}{p^+ K^{p^-}} \sup_{\gamma>0} \frac{\gamma^{p^-}}{\int_\Omega \sup_{|t|\le\gamma} F(x; u)dx}.$$

Hence, there exists $\bar{\gamma} > 0$ such that

$$\lambda p^+ K^{p^-} < c_2 \sup_{\bar{\gamma}>0} \frac{\bar{\gamma}^{p^-}}{\int_\Omega \sup_{|t|\le\bar{\gamma}} F(x; u)dx}.$$

Put $r = \frac{c_2}{p^+} \left(\frac{\bar{\gamma}}{K}\right)^{p^-}$. Moreover, for all $u \in X$ with $\Phi(u) < r$, taking Proposition1.3 into account, we have

$$\| u \| \leq \max\left\{\left(\frac{rp^+}{c_2}\right)^{\frac{1}{p^+}}, \left(\frac{rp^+}{c_2}\right)^{\frac{1}{p^-}}\right\}.$$

So, from Remark 1.1 for $r > c_2$ we have $|u(x)| \leq \bar{\gamma}$. then

$$\sup_{\Phi(u)\leq r} \Psi(u) = \int_\Omega \sup_{|t|\leq\bar{\gamma}} F(x; u)dx.$$

By simple calculations and from the definition of $\varphi(r)$, since $0 \in \Phi^{-1}(-\infty, r)$
And $\Phi(0) = \Psi(0) = 0$, one has

$$\varphi(r) := \inf_{\Phi(u)<r}\left(\frac{\left(\sup_{u'\in\Phi^{-1}(\ ]-\infty,r[\ )}\Psi(u')\right) - \Psi(u)}{r - \Phi(u)}\right) \leq \frac{\sup_{\Phi^{-1}(\ ]-\infty,r[\ )}\Psi}{r}$$

$$\leq \frac{p^+K^{p^-}}{c_2}\frac{\int_\Omega \sup_{|t|\leq\bar{\gamma}} F(x; u)dx}{\gamma^{p^-}} \leq \frac{1}{\lambda}.$$

So, since $\lambda \in (0, \frac{1)}{\varphi(r}$), Theorem 1.1 ensures that the functional I_λ admits at least one critical point (local minima).

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ЛИШАЙНИКИ КАРАТЕПИНСКИХ ГОР

Маъсуджон Норкулов
Шербек Холбутаев
Самаркандский государственный университет имени Шарофа Рашидова
masud.norqulov@mail.ru

АННОТАЦИЯ

В статье представлены сведения о таксономии и экологии лишайников каратепинских гор. Согласно проведенным исследованиям, 10 семейств класса Lecanoromycetes (Parmeliaceae, Ramalinaceae, Megasporaceae, Physciaceae, Teloschistaceae, Peltigeraceae, Collemataceae, Candelariaceae, Umbilicariaceae, Physciaceae), 1 семейство класса Eurotiomycetes (Verrucariaceae) и 1 семейство Lichinaceae класса Lichinomycetes было определено, 18 групп и 23 вида были отмечены как широко распространенные. Представлен таксономический анализ и экологические характеристики идентифицированных видов.

Ключевые слова: лишайник, lichenomycota, эпилит, эпигей, эпифит, эпиксил, эпибриофит, таллом, фотобионт, микобионт.

ABSTRACT

The article presents information about the taxonomy and ecology of lichens in the Karatepa mountains. According to the conducted studies, 10 families of the Lecanoromycetes class (Parmeliaceae, Ramalinaceae, Megasporaceae, Physciaceae, Teloschistaceae, Peltigeraceae, Collemataceae, Candelariaceae, Umbilicariaceae, Physciaceae), 1 family of the Eurotiomycetes class (Verrucariaceae) and 1 family Lichinaceae of the class Lichinomycetes were identified, 18 groups and 23 species were noted as widespread. The taxonomic analysis and ecological characteristics of the identified species are presented.

Keywords: lichen, lichenomycota, epilite, epigee, epiphyte, epixyl, epibriophyte, tallom, photobiont, mycobiont.

ВВЕДЕНИЕ

Отдел лишайников - Lichens, Lichenomycota занимает особое место среди низших растений. Они широко распространены на всех континентах Земли и представляют собой организмы, приспособленные к произрастанию в различных условиях окружающей среды, а также в крайне неблагоприятных климатических зонах.

Во флоре мира насчитывается от 13 500 до 26 000 видов лишайников [1, 2]. По данным Кудратова [6], в Средней Азии имеется 719 видов лишайников, Л.И. Бредкиной, И.И. Макаровой [6] и др., распространено 219 видов. По другим данным, 325 видов лишайников распространены в Туркменистане, 329 видов в Кыргызстане и 538 видов в Таджикистане [6]. Соответственно, имеется много информации по систематике, таксономии, биогеографии лишайниковой флоры, распространенной в Таджикистане, Казахстане и Кыргызстане. Однако в научных источниках нет достаточной информации о флоре, таксономии, видовом составе и экологии лишайников в Узбекистане. Эта информация имеет большое теоретическое и практическое значение. Поэтому мы поставили перед собой задачу провести лихенологические исследования в среднем течении реки Зарафшан.

В течение 2018-2021 гг. изучались флористический состав и экологические характеристики лишайников горного массива Каратепа, который является северной частью Зарафшанского хребта.

МЕТОДОЛОГИЯ ИССЛЕДОВАНИЯ

Сбор лишайников в природе и идентификация их, с использованием методов А.Г. Цуриков, О. Храмченкова [8], Е. Мучник, И. Инсарова, М. Казаковой [5]. Все исследования и анализы проводились в лаборатории кафедры ботаники СамГУ. Для макро- и микро морфологического исследования гербарных материалов использовались монокулярные микроскопы M-15295, OPTICA MICROSCOPES и Biolam. Для определения видового состава лишайников и изучения их морфологических и классических особенностей использовалась соответствующая научная литература [9,10,11,12,13,20]. В обработке по систематическим группам таксономии лишайников использовались базы *plantarium.ru, waysofenlichenment.net, lichensmaritimes.org, lichenology.info, lichenportal.org, gbif.org, afl-lichenologie.fr*, а также сайты ecosystema.ru по идентификации в сети “A Cumulative Checklist for the Lichen-Forming, Lichenicolous and Allied Fungi of the Continental United States and Canada, Version 22-23” (Theodore L. Esslinger 2018-2019) [6,7,22,]

В ходе исследования было отобрано более 200 лихенологических проб из различных экологических условий. Все образцы хранятся на кафедре ботаники в Самаркандского государственого университета.

АНАЛИЗ И РЕЗУЛЬТАТЫ

Каратепинские горы - западная часть горного хребта Зарафшан. Протяженность с востока на запад 50 км, с севера на юг 35-40 км. Он отделен от хребта Чакилкалон в восточной части перевалом Тахтакорача. Средняя высота 1000-1500 м, высшая точка - пик Кумгаза 2197 м. Склоны гор Каратепа окаймлены множеством глубоких русел рек, Илонсай, Агалык, Аксай, Сазагонсай и др. На севере, а также несколькими правыми притоками Кашкадарьи на юге (Макрид, Аяакчидарья, Тарагай и др.). Каратепинские горы представляют собой большое куполообразное горстантиклинальное поднятие, состоящее в основном из палеозойских магматических, метаморфических и осадочных пород (гранита, гранодиорита, диорита, сланца, песчаника и известняка). В горах встречаются типичные и темно-серые и бурые почвы. Растут Мятлик луковичный, Осока толстостолбиковая, Пырей волосоносный, различные кустарники (миндаль, шиповник и др.), можжевельник (Рис. 1).

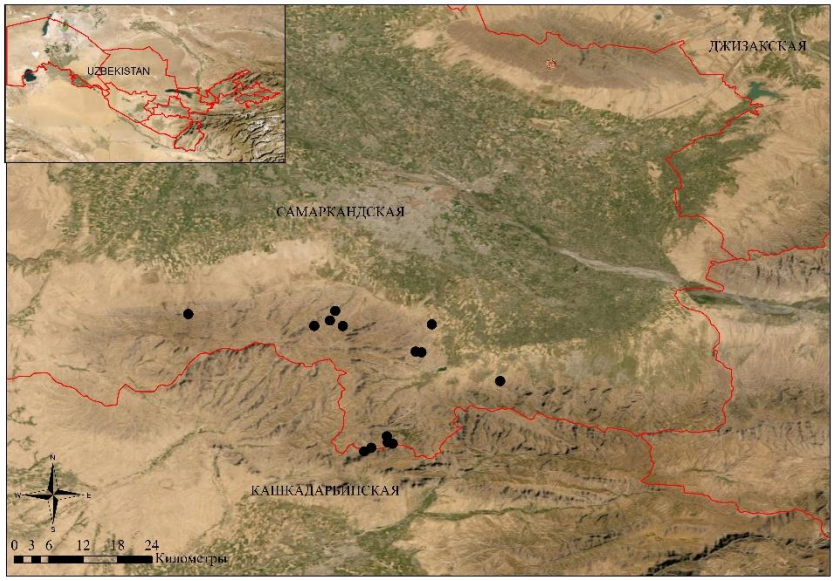

Рис 1. Районы исследований Каратепинских гор.

По результатам исследований установлено, что в Каратепинских горах произрастают 22 вида лишайников. Они принадлежат 3 классам (*Lecanoromycetes, Eurotiomycetes, Lichinomycetes*), 11 порядкам, 13 семействам, 18 группам (Табл. 1).

Таблица-1

Таксономический анализ лишайников Каратепинских гор

Класс	Порядок	Семейство	Группа	Количество видов	В %
Lecanoromyce-tes	Lecanorales	Parmeliaceae	*Neofuscelia*	2	8,7
			Pleurosticta	1	4,3
		Lecanoraceae	*Lecanora*	2	8,7
			Rhizoplaca	1	4,3
		Ramalinaceae	*Ramalina*	1	4,3
	Pertusariales	Megasporaceae	*Aspicilia*	1	4,3
	Caliciales	Physciaceae	*Physcia*	2	8,7
	Teloschistales	Teloschistaceae	*Xanthoria*	1	4,3
			Caloplaca	1	4,3
	Peltigerales	Peltigeraceae	*Peltigera*	2	8,7
	Peltigerales	Collemataceae	*Leptogium*	1	4,3
	Candelariales	Candelariaceae	*Candelariella*	1	4,3
	Umbilicariales	Umbilicariaceae	*Umbilicaria*	1	4,3
	Caliciales	Physciaceae	*Phaeophyscia*	1	4,3
Eurotiomycetes	Verrucariales	Verrucariaceae	*Dermatocar-pon*	2	8,7
			Placidium	1	4,3
Lichinomycetes	Lichinales	Lichinaceae	*Lichinella*	3	13
3	**11**	**13**	**18**	**23**	**100**

Исследуемые лишайники могут расти в почве, деревьях, камнях и других условиях. Лишайники нами были разделены на несколько экологических групп в зависимости от их отношения к окружающей среде и внешним факторам: эпигей, эпилит, эпифит, эпиксил, эпибриофит и эпифилловые лишайники. Отобранные в ходе исследования образцы гербария были распределены по видовому составу, экологические группы - по семействам (Табл. 2).

Таблица-2

Экологические группы лишайников в зависимости от среды их произрастания

Семейства	**Эпигей**	**Эпилит**	**Эпифит**	**Эпиксил**	**Эпибриофит**	**Эпифилл**
Lecanoromycetes						
Parmeliaceae		+	+			
Lecanoraceae		+				
Ramalinaceae			+			
Megasporaceae		+				
Physciaceae	+	+	+			
Teloschistaceae	+	+			+	
Peltigeraceae	+			+	+	
Collemataceae		+	+		+	
Candelariaceae	+	+				
Umbilicariaceae		+				
Physciaceae						
Eurotiomycetes						
Verrucariaceae	+	+				
Lichinomycetes						
Lichinaceae		+				

Согласно данным таблицы, идентифицированные лишайники относились к 10 видам эпилитов в зависимости от их отношения к субстратам. На их долю приходилось 44% от общего числа видов. Помимо этого, различные виды относятся 5 эпигейям, 4 эпифитам, 1 эпиксилам и 3 эпибриофиты. Эпигейные лишайники произрастают в почвах (песчаных, торфяных, гравийных). К ним относятся такие виды как, *Physcia tribacia* (Ach.) Nyl., *Caloplaca tomini* (Savicz) Ahlner., *Peltigera canina* (L.) Willd., *Peltigera rufescens* (Weiss) Humb., *Candelariella spraguei* (Tuck.) Zahlbr., *Placidium squamulosum* (Achlbr.).

Эпилептические лишайники развиваются на каменистой среде. К ним относятся виды, принадлежащие к семейству Parmeliaceae, Lecanoraceae, Megasporaceae, Physciaceae, Teloschistaceae, Collemataceae, Candelariaceae, Umbilicariaceae, Verrucariaceae и Lichinaceae. Из этих видов семейства широко распространены такие виды как *Xanthoria elegans* (Link) Th. Fr., *Dermatocarpon minimatum* (L.) W. Mann., *Lichinella nigritella* (Lettau) P.P. Moreno et Egea.

Эпифитные лишайники растут на коре, стеблях и ветвях деревьев и кустарников и включают в себя накипные, или корковые, кустистые и листоватые формы. Субстрат они

используют только как среду обитания. Среди идентифицированных видов - *Pleurosticta aceabulum* (Neck.) Elix et Lumbsch., *Ramalina pollinaria* (Westr.) Ach., *Physcia biziana* (A. Massal.) Zahlbr., *P. tribacia* (Ach.) Nyl., *Leptogium asiaticum* P.M. Jorg. относятся к таким видам.

Эпиксильные лишайники - развиваются в обработанной древесине, гнилой древесине и гнилых стволах лиственных и кустарниковых видов. Согласно исследованиям выявлено, что в эту группу входят виды *Peltigera canina, P. rufescens*, принадлежащие к семейству *Peltigeraceae*. Эпибриофитные лишайники растут на дёрне с мхом (леса в северном регионе, в очень влажных средах). К ним относятся виды *Caloplaca tomini* (Savicz) Ahlner., *Peltigera canina, P. rufescens, Leptogium asiaticum, Placidium squamulosum* (Ach.) Breuss. (Рис. 2).

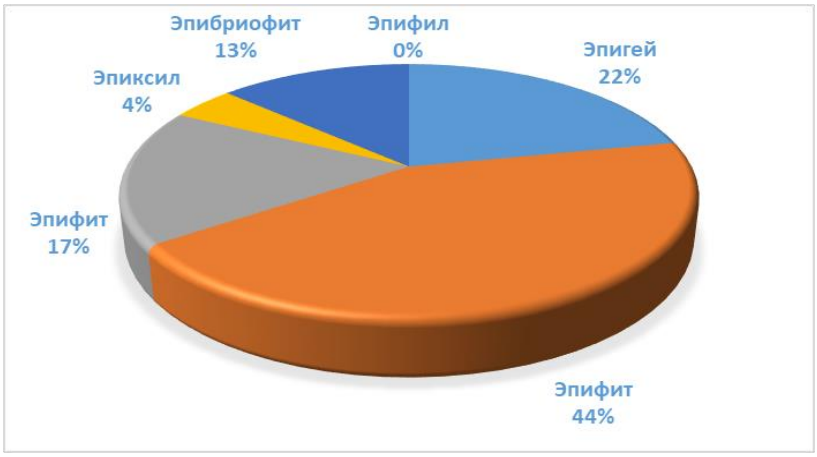

Рис 2. Экологические группы лишайников в зависимости от их отношения к окружающей среде и внешним факторам.

Эпифилловые лишайники всегда растут на листьях и иглах хвойных деревьев, их количество обычно невелико, распространено в тропических и субтропических регионах, поэтому на изучаемой нами территории они не обнаружены.

При видовом анализе по влажности лишайников на исследуемой территории было выявлено 6 видов мезогигрофитов (26,09%), 8 видов мезофитов (34,78%), 6 видов ксеромезофитов (26,09%), 3 вида ксерофитов (13,04%) (Рис. 3).

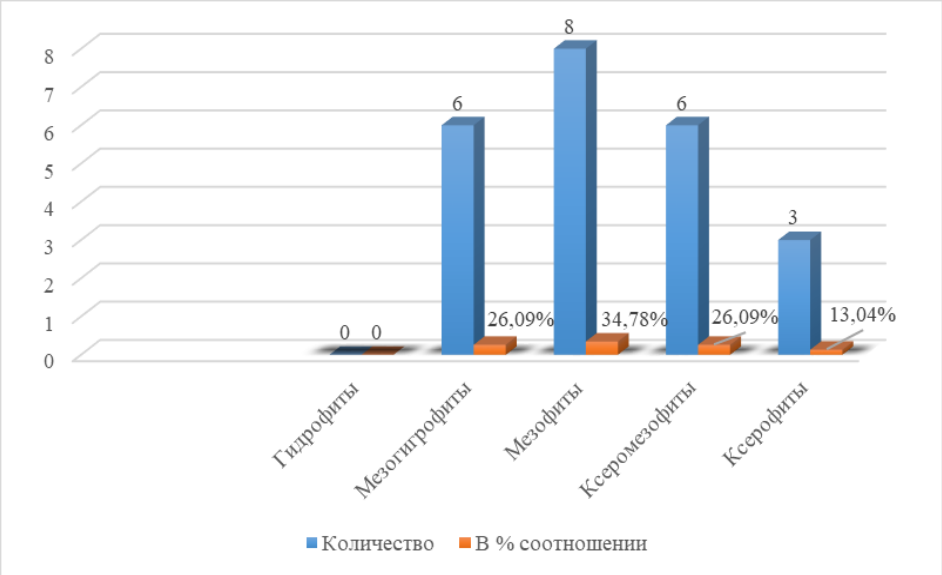

Рис 3. Анализ отношения лишайников к влажности.

Мезофитные лишайники можно найти в Каратепинских горах в период высокой влажности (ранняя весна, поздняя осень и частичная зима), в основном на камнях, песке и гравии на берегах оврагов и в коре деревьев, где не попадает солнечный свет. При значительном понижении влажности они переходят в период покоя. В эту экологическую группу входят *Peltigera canina*, *P.rufescens* и др.

Отмечено, что ксерофитные лишайники растут весной, летом и осенью на южных и юго-западных склонах гор, на больших камнях, находящихся под постоянным солнечным светом, в коре деревьев и на поверхности сухих почв. Нами были идентифицированы на этих средах из ксерофитных лишайников *Xanthoria elegans* (Link) Th. Fr. и *Lecanora muralis* (Schreb.) Rabenh. Эти виды распространены на скалах, деревьях и кустарниках в южной и юго-западной части гор, а также на поверхности почвы.

Известно, что ксеромезофитные лишайники развиваются весной и осенью. Летом их встречали только во влажных местах, где нет прямого солнечного света. Наиболее распространенными из них являются *Placidium squamulosum* и *Dermatocarpon minimatum*. *Lichinella nigritella* lichen произрастает у мелких щебнистых и затопленных местах в верхней части Каратепинских гор. Этот вид - мезогигрофит.

Гидрофитные лишайники - это очень специфические водные лишайники, которые постоянно или большую часть года проводят под водой. Эти лишайники не изучены биологически, и гидрофитные лишайники не были идентифицированы в ходе наших исследований. Среди водных и наземных видов в ареале

обитания есть ряд похожих видов. Эти виды могут долго противостоять наводнениям, но есть также виды, которые обычно живут вне воды. Это *Rhizocarpon obscuratum* (Ach.) A. Massal. (*Rhizocarpon reductum* Th. Fr.), *Lecidea albocoerulescens* (Wulfen.) Hertel & Knoph. и другие виды.

ЗАКЛЮЧЕНИЕ

1. Согласно нашим исследованиям выявлено 23 вида лишайников в Каратепинских горах. Это виды, принадлежащие 3 классам (Lecanoromycetes, Eurotiomycetes, Lichinomycetes), 11 порядкам, 13 семействам, 18 родам.

2. Из выявленных лишайников 10 видов - эпилиты (44%), 5 видов - эпигиты (22%), 4 типа - эпифиты (17%), 1 тип - эпиксил (4%) и 3 типа - эпибриофиты (13%).

3. По отношению к влажности, лишайников на исследуемой территории мезогигрофиты отмечены 6 видов (26,09%), мезофиты 8 видов (34,78%), ксеромезофиты 6 видов (26,09%), ксерофиты 3 вида (13,04%).

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ANALYTICAL SOLUTION OF MULTI-DIMENSIONAL TIME-FRACTIONAL MODEL OF NAVIER-STOKES EQUATION BY RECONSTRUCTION OF VARIATIONAL ITERATION METHOD

Abbas Poya
Mohammad Ali Zirak
Department of Mathematics. Daykondi University. Nili. Afghanistan

ABSTRACT

In this paper. a new approximate solution of time-fractional order multi-dimensional Navier-Stokes equation is obtained by adopting a semi-analytical scheme "Reconstruction of Variational Iteraton Method (RVIM)". Three test problems are carried out in order to validate and illustrate the efficiency of the method. The scheme is found to be very reliable. effective and efficient powerful technique to solve wide range of problems arising in engineering and sciences. The small size of computation contrary to the other schemes. is its strength.

Keywords: Navier-Stokes equation; Caputo time-fractional. derivative; RVIM; Mittag-Leffler function.

1 Introduction

The idea of fractional derivative was first given by a great mathematician Leibniz. in 1695. in a letter to L'Hospital. Fractional calculus deals with the differential and integral operators with non-integral powers. Noting that the integer-order differential operator is a local operator while the fractionalorder differential operator is non-local. it means that the next state of a system depends not only upon its current state but also upon all of its previous states. It is more realistic and is one of the main reasons why the fractional calculus has become so popular. In the recent years. advances of fractional differential equations have a great attention due to their numerous applications in a wide range of nonlinear complex systems arising in fluid mechanics. viscoelasticity. mathematical biology. life sciences. electrochemistry and physics[1]–[7]For instance. the non-linear oscillation of earthquake can be modeled with fractional derivatives [8]. Fractional differential equations have created attention among the researcher due to exact description of non-linear phenomena. especially in nano-hydrodynamics where continuum assumption does not well. and fractional model can be considered to be a best candidate. These findings invoked the growing interest of studies of the fractal calculus in many branches of science and engineering.

In the recent various analytical techniques such as Homotopy perturbation method (HPM) [9]. homotopy perturbation Sumudu transform method [10], [11]. homotopy analysis method (HAM) [12]. and Adomian decomposition method (ADM) [13], [14].have been developed to solve the fractional partial differential equation. By coupling of HPM and Laplace transform algorithm (LTA). Kumar et al. solved analytically the nonlinear fractional Zakharov Kuznetsov equation in [15]. At first. Keskin and Oturanc [16] introduce reduced differential transform method (RDTM) as a reduced form of differential transform method. and implement it to find the approximate solutions of partial (and factional partial) differential equations [16]. [17]. Fractional reduced differential transform method (FRDTM) has been adopted in many articles to solve the differential equations prevailing in mathematics. physics and

engineering [18], [19], [20], [21], [22], [23], [24], [25], [26],[27],[28], [29].

A famous governing equation of motion of viscus fluid flow called Navier-Stokes (NS) equation has been derived in 1822 [30]. The equation can be regarded as Newton's second law of motion for fluid substances. and is a combination of Momentum equation. continuity equation and the energy equation. This equation describes many physical things such as ocean currents. liquid flow in pipes. blood flow and air flow around the wings of an aircraft. The fractional modeling of NS equations was first done in 2005 by El-Shahed and Salem [31] . The authors [31] generalized the classical NS equations using Laplace transform. finite Hankel transforms and finite Fourier Sine transform. By coupling of HPM and LTA. Kumar et al [32]. solved analytically a nonlinear fractional model of NS equation. Ragab et al [12]. and Ganji et al[12] solved nonlinear time-fractional NS equation by adopting HAM. Birajdar [14] and Momani and Odibat [15] adopted ADM for numerical computation of time-fractional NS equation. Analytical solution of time-fractional NS equation is obtained using coupling of ADM and LTA by Kumar et al [15]. while Chaurasia and Kumar [33] solved the same equation by coupling of Laplace transform and finite Hankel transform. This paper presents an approximate analytic solution of Reconstruction of Variational Iteration Method. of NS equation by adopting (RVIM).

2 Basic Definition

Definition 2.1 : The Riemann-Liouville fractional integral of $f(t)$ of the order $\alpha \geq 0$ is defined as

$$J_t^{\alpha} f(t) = \begin{cases} f(t) & if\ \alpha = 0. \\ \frac{1}{\Gamma(\alpha)} \int_0^t (t-\tau)^{\alpha-1} f(\tau) \mathrm{d}\tau & if\ \alpha > 0. \end{cases} \quad (1)$$

where Γ denotes gamma function

$$\Gamma(z) = \int_0^{\infty} e^{-t} t^{z-1} \mathrm{d}t.\ z \in \mathbb{C}.$$

Definition 2.2: The fractional derivative of f of the order $\alpha \geq 0.$ in Caputo sense is defined as

$$D_t^{\alpha} f(t) = J_t^{m-1} D_t^m f(t) = \frac{1}{\Gamma(m-\alpha)} \int_0^t (t-\tau)^{m-\alpha-1} f^{(m)}(\tau) \mathrm{d}\tau. \quad (2)$$

for $m-1 < \alpha \leq m.\ m \in \mathbb{N}\ .\ t > 0.\ f \in \mathbb{C}^m.$

The basic properties of Caputo fractional derivative are given as follows:

Definition 2.3: The Mittag-Leffler functions. which is generalization of the exponential function. is defined as:

$$E_{\alpha}(z) = \sum_{k=0}^{\infty} \frac{z^n}{\Gamma(\alpha n+1)}. \quad E_{\alpha.\beta}(z) = \sum_{k=0}^{\infty} \frac{z^n}{\Gamma(\alpha n+\beta)} \quad (3)$$

Lemma 2.1: Let $m-1 < \alpha \geq m$ and $f \in \mathbb{C}^m.$ then

$$D_t^{\alpha} J_t^{\alpha} f(t) = f(t).$$

$$J_t^{\alpha} D_t^{\alpha} f(t) = f(t) - \sum_{k=0}^{m} f^k(0^+) \frac{t^k}{k!}. \quad t > 0.$$

3 Implementation of RVIM on Navier-Stokes equation

In this section we introduce an approximate analytical method to solve Navier-Stokes system of fractional differential equation of order $0 < \alpha < 1$. Hesameddini and Latifzadeh [34] presented the Reconstruction of Variational Iteration Method (RVIM) for differential equations of integer and fractional order. Here. we expand this approach to solve multi-dimensional. time-fractional model of Navier-Stokes equation. In Cartesian co-ordinates. the following equations becomes.

$$\begin{cases} D_t^{\alpha}u + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} + w\frac{\partial u}{\partial z} = \rho_0\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}\right) - \frac{1}{\rho}\frac{\partial p}{\partial x} \\ D_t^{\alpha}v + u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y} + w\frac{\partial v}{\partial z} = \rho_0\left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} + \frac{\partial^2 v}{\partial z^2}\right) - \frac{1}{\rho}\frac{\partial p}{\partial y} \\ D_t^{\alpha}w + u\frac{\partial w}{\partial x} + v\frac{\partial w}{\partial y} + w\frac{\partial w}{\partial z} = \rho_0\left(\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} + \frac{\partial^2 w}{\partial z^2}\right) - \frac{1}{\rho}\frac{\partial p}{\partial z} \end{cases} \quad (4)$$

with initial conditions $u_0(x.y.z.t) = f(x.y.z.0).v_0(x.y.z.t) = g(x.y.z.0).w_0(x.y.z.t) = h(x.y.z.0)$.

In (4) where the operator D_t^{α} is the Caputo fractional derivatives and $m-1 < \alpha \le m$ and $\rho_0 = \frac{\eta}{\rho}$ denotes the kinematic viscosity of the flow. which η denotes dynamic viscosity and ρ is density. if p is known. then $g_1 = \frac{1}{\rho}\frac{\partial p}{\partial x}.g_2 = \frac{1}{\rho}\frac{\partial p}{\partial y}.\ g_3 = \frac{1}{\rho}\frac{\partial p}{\partial z}$ and $\nabla^2 = \left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} + \frac{\partial^2}{\partial z^2}\right)$. By taking Laplas Transform from both side of equation (4). with respect to the independent variable t and using the homogeneous initial condition. we get

$$\begin{aligned} s^{\alpha}\mathcal{L}\{u(x.y.z.t)\} - s^{\alpha-1}u(x.y.z.0) &= \mathcal{L}\left\{-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 u - g_1\right\}. \\ s^{\alpha}\mathcal{L}\{v(x.y.z.t)\} - s^{\alpha-1}v(x.y.z.0) &= \mathcal{L}\left\{-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 v - g_2\right\}. \quad (5) \\ s^{\alpha}\mathcal{L}\{w(x.y.z.t)\} - s^{\alpha-1}w(x.y.z.0) &= \mathcal{L}\left\{-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 w - g_3\right\}. \end{aligned}$$

Therefore

$$\begin{aligned} \mathcal{L}\{u(x.y.z.t)\} &= \frac{1}{s}u(x.y.z.0) + \frac{1}{s^{\alpha}}\mathcal{L}\left\{-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 u - g_1\right\}. \\ \mathcal{L}\{v(x.y.z.t)\} &= \frac{1}{s}v(x.y.z.0) + \frac{1}{s^{\alpha}}\mathcal{L}\left\{-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 v - g_2\right\}. \quad (6) \\ \mathcal{L}\{w(x.y.z.t)\} &= \frac{1}{s}w(x.y.z.0) + \frac{1}{s^{\alpha}}\mathcal{L}\left\{-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 w - g_3\right\}. \end{aligned}$$

suppose $-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 u - g_1 = f(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2})$. $-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 v - g_2 = g(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2})$. $-u\frac{\partial u}{\partial x} - v\frac{\partial u}{\partial y} - w\frac{\partial u}{\partial z} + \rho_0\nabla^2 w - g_3 = h(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2})$. Now by applying the inverse Laplace transform to both side of equation(7). and using the convolution theorem we

$$
\begin{aligned}
u(x.y.z.t) &= f_0(x.y.z.t) + \mathcal{L}^{-1}\left\{\frac{1}{s^\alpha}F\left(s.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right)\right\} \\
&= f_0(x.y.z.t) + \frac{t^{\alpha-1}}{\Gamma(\alpha)} \star f\left(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right) \\
&= f_0(x.y.z.t) + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1} f\left(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right)\mathrm{d}\tau. \\
v(x.y.z.t) &= g_0(x.y.z.t) + \mathcal{L}^{-1}\left\{\frac{1}{s^\alpha}G\left(s.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right)\right\} \\
&= g_0(x.y.z.t) + \frac{t^{\alpha-1}}{\Gamma(\alpha)} \star g\left(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right) \\
&= g_0(x.y.z.t) + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1} g\left(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right)\mathrm{d}\tau. \\
w(x.y.z.t) &= h_0(x.y.z.t) + \mathcal{L}^{-1}\left\{\frac{1}{s^\alpha}H\left(s.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right)\right\} \\
&= h_0(x.y.z.t) + \frac{t^{\alpha-1}}{\Gamma(\alpha)} \star h\left(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right) \\
&= h_0(x.y.z.t) + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1} h\left(t.x.y.z.\frac{\partial u}{\partial x}.\frac{\partial u}{\partial y}.\frac{\partial u}{\partial z}.\frac{\partial u^2}{\partial x^2}.\frac{\partial u^2}{\partial y^2}.\frac{\partial u^2}{\partial z^2}\right)\mathrm{d}\tau.
\end{aligned} \tag{7}
$$

according to [34] by imposing to initial condition to obtain the solution of equation (4) . we construct an iteration formula as follows:

$$
\begin{aligned}
&u_{n+1}(x.y.z.t) = f_0(x.y.z.t) \\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1} f\left(t.x.y.z.\frac{\partial u_n}{\partial x}.\frac{\partial u_n}{\partial y}.\frac{\partial u_n}{\partial z}.\frac{\partial u_n^2}{\partial x^2}.\frac{\partial u_n^2}{\partial y^2}.\frac{\partial u_n^2}{\partial z^2}\right)\mathrm{d}\tau. \\
&v_{n+1}(x.y.z.t) = g_0(x.y.z.t) \\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1} g\left(t.x.y.z.\frac{\partial u_n}{\partial x}.\frac{\partial u_n}{\partial y}.\frac{\partial u_n}{\partial z}.\frac{\partial u_n^2}{\partial x^2}.\frac{\partial u_n^2}{\partial y^2}.\frac{\partial u_n^2}{\partial z^2}\right)\mathrm{d}\tau. \\
&w_{n+1}(x.y.z.t) = h_0(x.y.z.t) \\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1} h\left(t.x.y.z.\frac{\partial u_n}{\partial x}.\frac{\partial u_n}{\partial y}.\frac{\partial u_n}{\partial z}.\frac{\partial u_n^2}{\partial x^2}.\frac{\partial u_n^2}{\partial y^2}.\frac{\partial u_n^2}{\partial z^2}\right)\mathrm{d}\tau.
\end{aligned} \tag{8}
$$

where $f_0(x.y.z.t).g_0(x.y.z.t)).h_0(x.y.z.t).$ is initial solution. By the above iteration each term will be determined by the previous term in the approximation of iteration formula can be entirely evaluated. Consequently the solution may be written as:

$$
\begin{aligned}
u(x.y.z.t) &= \lim_{\to\infty} u_n(x.y.z.t). \\
v(x.y.z.t) &= \lim_{\to\infty} v_n(x.y.z.t). \\
w(x.y.z.t) &= \lim_{\to\infty} w_n(x.y.z.t).
\end{aligned} \tag{9}
$$

3.1 Illustrative examples

Consider time-fractional order 2-dimensional NS equation with $g_1 = -g_2 = g$ as

$$
\begin{aligned}
D_t^\alpha u + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} &= \rho_0\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right) + g. \\
D_t^\alpha v + u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y} &= \rho_0\left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2}\right) - g.
\end{aligned} \tag{10}
$$

with the initial conditions

$$u(x.y.0) = -\sin(x+y). \quad v(x.y.0) = \sin(x+y)$$

Using RVIM on the above two equations. we obtained the following recurrence relation:

$$\begin{aligned} u_{n+1}(x.y.t) &= f_0(x.y.t) \\ &+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_n\frac{\partial u_n}{\partial x} - v_n\frac{\partial u_n}{\partial y} + \rho_0\left(\frac{\partial^2 u_n}{\partial x^2}+\frac{\partial^2 u_n}{\partial y^2}\right)+g\right]d\tau \\ v_{n+1}(x.y.t) &= g_0(x.y.t) \\ &+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_n\frac{\partial v_n}{\partial x} - v_n\frac{\partial v_n}{\partial y} + \rho_0\left(\frac{\partial^2 v_n}{\partial x^2}+\frac{\partial^2 v_n}{\partial y^2}\right)-g\right]d\tau \end{aligned} \tag{11}$$

for $n=0$ we obtain as:

$$\begin{aligned} u_1(x.y.t) &= f_0(x.y.t) \\ &+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_0\frac{\partial u_0}{\partial x} - v_0\frac{\partial u_0}{\partial y} + \rho_0\left(\frac{\partial^2 u_0}{\partial x^2}+\frac{\partial^2 u_0}{\partial y^2}\right)+g\right]d\tau \\ v_1(x.y.t) &= g_0(x.y.t) \\ &+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_0\frac{\partial v_0}{\partial x} - v_0\frac{\partial v_0}{\partial y} + \rho_0\left(\frac{\partial^2 v_0}{\partial x^2}+\frac{\partial^2 v_0}{\partial y^2}\right)-g\right]d\tau \end{aligned} \tag{12}$$

by simplifying we obtain that:

$$\begin{aligned} u_1(x.y.t) = &\quad -\sin(x+y)+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(2\rho_0\sin(x+y)+g)d\tau \\ &= \sin(x+y)\left(-1+\frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)}\right)+g\frac{t^\alpha}{\Gamma(1+\alpha)} \\ v_1(x.y.t) = &\quad \sin(x+y)+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(2\rho_0\sin(x+y)-g)d\tau \\ &= \sin(x+y)\left(1-\frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)}\right)-g\frac{t^\alpha}{\Gamma(1+\alpha)} \end{aligned} \tag{13}$$

for $n=1$ we obtain as:

$$\begin{aligned} u_2(x.y.t) &= \sin(x+y)\left(-1+\frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)}-\frac{(2\rho_0)^2 t^{2\alpha}}{\Gamma(1+2\alpha)}\right)+g\frac{t^\alpha}{\Gamma(1+\alpha)} \\ v_2(x.y.t) &= \sin(x+y)\left(1-\frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)}+\frac{(2\rho_0)^2 t^{2\alpha}}{\Gamma(1+2\alpha)}\right)-g\frac{t^\alpha}{\Gamma(1+\alpha)} \end{aligned} \tag{14}$$

recently we get:

$$\begin{aligned} u(x.y.t) &= \lim_{n\to\infty} u_n(x.y.t) = -\sin(x+y)\sum_{k=0}^{\infty}\frac{(-2\rho_0 t^\alpha)^k}{\Gamma(1+k\alpha)}+\frac{gt^\alpha}{\Gamma(1+\alpha)} \\ &-\sin(x+y)E_\alpha(-2\rho_0 t^\alpha)-\frac{gt^\alpha}{\Gamma(\alpha+1)}. \\ v(x.y.t) &= \lim_{n\to\infty} v_n(x.y.t) = \sin(x+y)\sum_{k=0}^{\infty}\frac{(-2\rho_0 t^\alpha)^k}{\Gamma(1+k\alpha)}-\frac{gt^\alpha}{\Gamma(1+\alpha)} \\ &\sin(x+y)E_\alpha(-2\rho_0 t^\alpha)-\frac{gt^\alpha}{\Gamma(\alpha+1)}. \end{aligned} \tag{15}$$

for $g=0$ and $\alpha=1$ we obtain as

$$\begin{aligned} u(x.y.t) &= -e^{-2\rho_0 t}\sin(x+y.) \\ v(x.y.t) &= e^{-2\rho_0 t}\sin(x+y). \end{aligned} \tag{16}$$

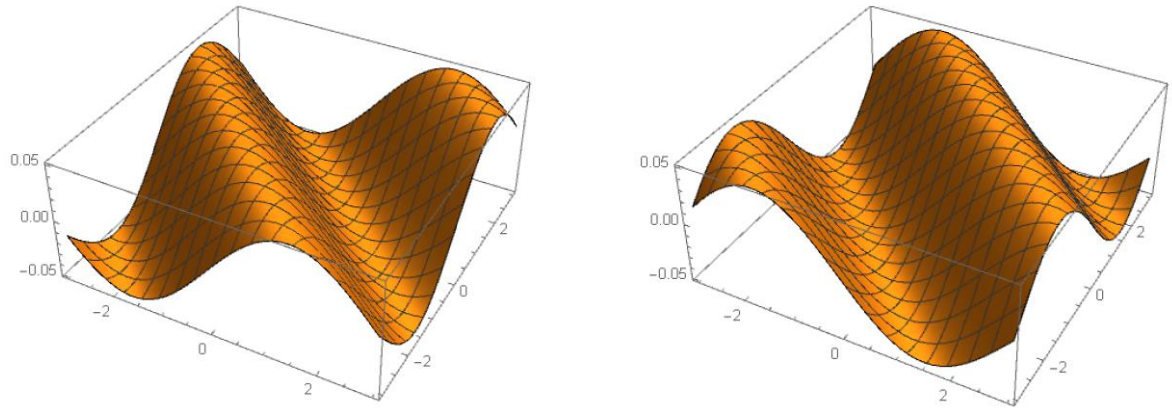


Figure 1: The behavior of u and v of NS equation in 2.1 at $t = 3$ with parameters $\alpha = 1. g = 0. \rho_0 = 0.5$

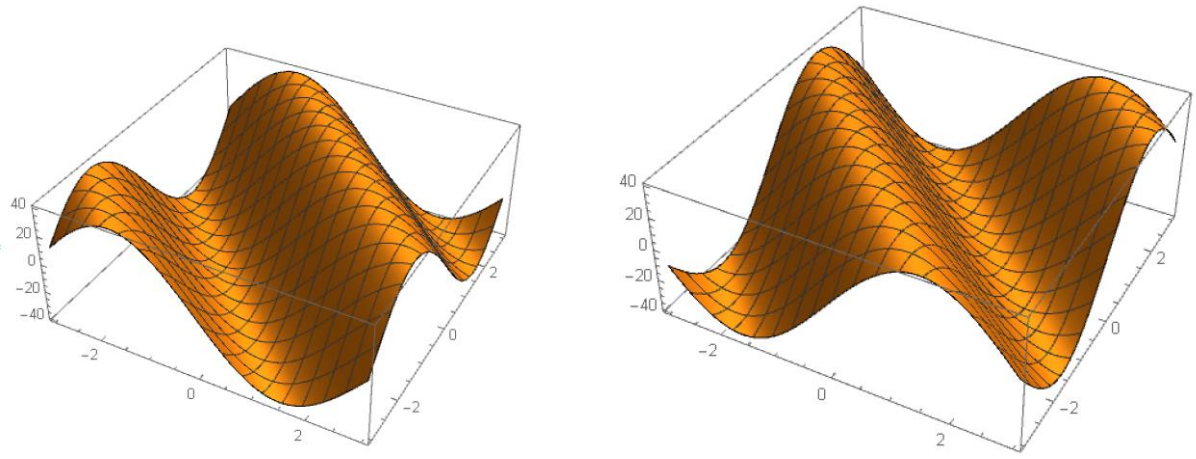
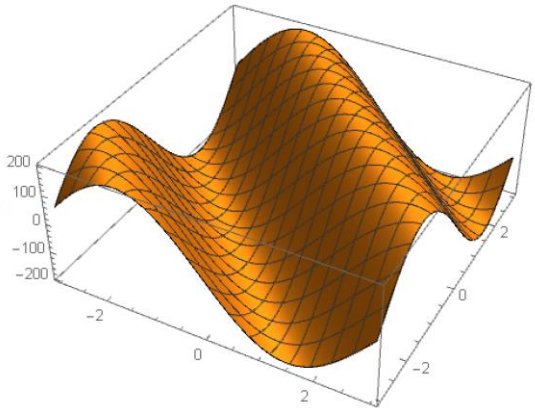


Figure 2: The behavior of u and v of NS equation in 2.1 at $t = 3$ with parameters $\alpha = 0.5. g = 0. \rho_0 = 0.5$



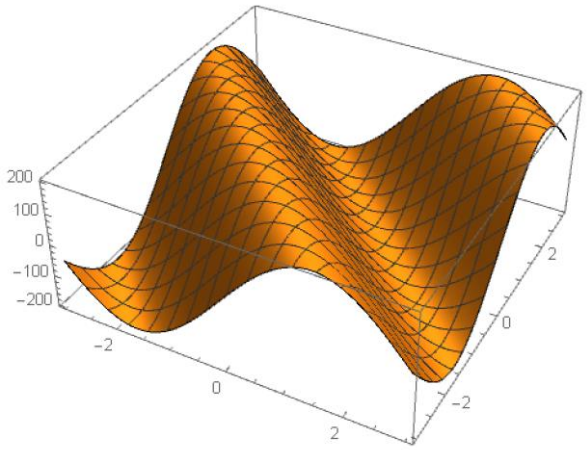


Figure 3: The behavior of u and v of NS equation in 2.1 at $t = 3$ with parameters $\alpha = 0.1. g = 0. \rho_0 = 0.5$

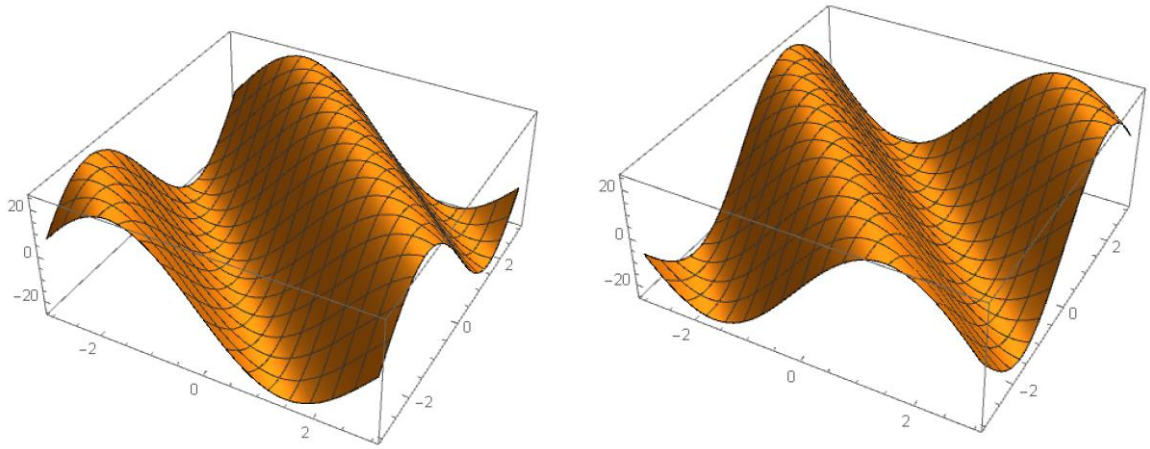


Figure 4: The behavior of u and v of NS equation in 2.1 at $t = 3$ with parameters $\alpha = 0.8. g = 0. \rho_0 = 0.5$

Consider time-fractional order two dimensional (10) subject to the initial condition:

$$u(x.y.0) = -e^{x+y}. \quad v(x.y.0) = e^{x+y} \tag{17}$$

for $n = 0$ we obtain as:

$$\begin{aligned} u_1(x.y.t) &= f_0(x.y.t) \\ &+ \frac{1}{\Gamma(\alpha)} \int_0^t (t-\tau)^{\alpha-1} \left[-u_0 \frac{\partial u_0}{\partial x} - v_0 \frac{\partial u_0}{\partial y} + \rho_0 \left(\frac{\partial^2 u_0}{\partial x^2} + \frac{\partial^2 u_0}{\partial y^2} \right) + g \right] d\tau \\ v_1(x.y.t) &= g_0(x.y.t) \\ &+ \frac{1}{\Gamma(\alpha)} \int_0^t (t-\tau)^{\alpha-1} \left[-u_0 \frac{\partial v_0}{\partial x} - v_0 \frac{\partial v_0}{\partial y} + \rho_0 \left(\frac{\partial^2 v_0}{\partial x^2} + \frac{\partial^2 v_0}{\partial y^2} \right) - g \right] d\tau \end{aligned} \tag{18}$$

by simplifying we obtain that:

$$\begin{aligned} u_1(x.y.t) = & -e^{x+y} + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(2\rho_0 e^{x+y} + g)\mathrm{d}\tau \\ & = -e^{x+y}\left(1 + \frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)}\right) + g\frac{t^\alpha}{\Gamma(1+\alpha)} \\ v_1(x.y.t) = & \ e^{x+y} + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(2\rho_0 e^{x+y} - g)\mathrm{d}\tau \\ & = e^{x+y}\left(1 + \frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)}\right) - g\frac{t^\alpha}{\Gamma(1+\alpha)} \end{aligned} \quad (19)$$

for $n = 1$ we obtain as:

$$\begin{aligned} u_2(x.y.t) &= -e^{x+y}\left(1 + \frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)} + \frac{(2\rho_0)^2 t^{2\alpha}}{\Gamma(1+2\alpha)}\right) + g\frac{t^\alpha}{\Gamma(1+\alpha)} \\ v_2(x.y.t) &= e^{x+y}\left(1 + \frac{2\rho_0 t^\alpha}{\Gamma(1+\alpha)} + \frac{(2\rho_0)^2 t^{2\alpha}}{\Gamma(1+2\alpha)}\right) - g\frac{t^\alpha}{\Gamma(1+\alpha)} \end{aligned} \quad (20)$$

recently we get:

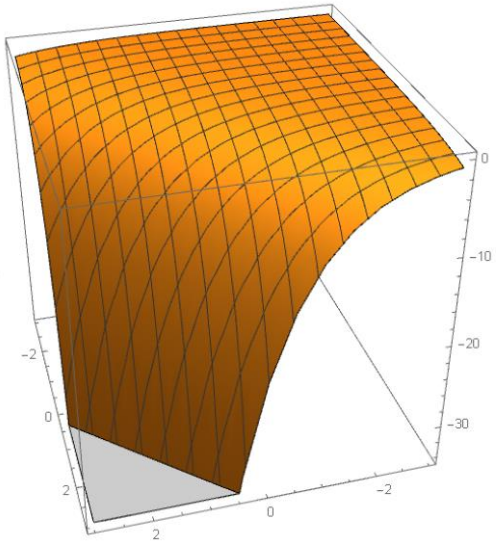
$$\begin{aligned} u(x.y.t) &= \lim_{n\to\infty} u_n(x.y.t) = -e^{x+y}\sum_{k=0}^{\infty}\frac{(2\rho_0 t^\alpha)^k}{\Gamma(1+k\alpha)} + \frac{gt^\alpha}{\Gamma(1+\alpha)} \\ &= -e^{x+y}E_\alpha(2\rho_0 t^\alpha) - \frac{gt^\alpha}{\Gamma(\alpha+1)}. \\ v(x.y.t) &= \lim_{n\to\infty} v_n(x.y.t) = e^{x+y})\sum_{k=0}^{\infty}\frac{(2\rho_0 t^\alpha)^k}{\Gamma(1+k\alpha)} - \frac{gt^\alpha}{\Gamma(1+\alpha)} \\ &= e^{x+y}E_\alpha(2\rho_0 t^\alpha) - \frac{gt^\alpha}{\Gamma(\alpha+1)}. \end{aligned} \quad (21)$$

for $g = 0$ and $\alpha = 1$ we obtain as

$$\begin{aligned} u(x.y.t) &= -e^{-2\rho_0 t}\sin(x+y.) \\ v(x.y.t) &= e^{-2\rho_0 t}\sin(x+y). \end{aligned} \quad (22)$$

for $g = 0$ and $\alpha = 1$ we obtain as:

$$u(x.y.t) = -e^{x+y+2\rho_0 t}. \quad v(x.y.t) = e^{x+y+2\rho_0 t}. \quad (23)$$



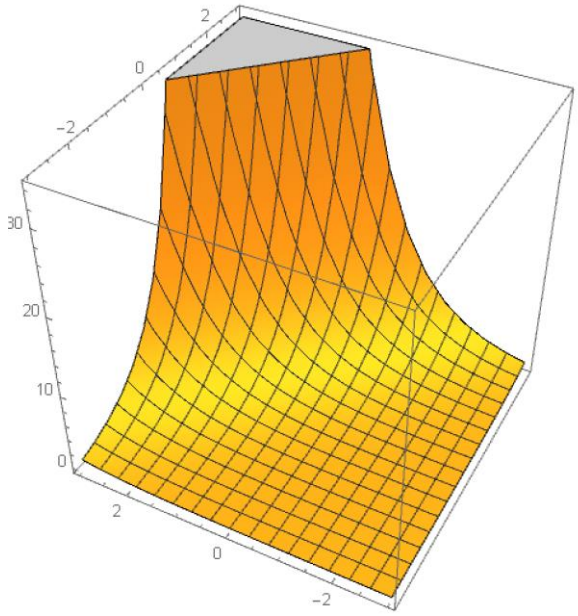


Figure 5: The behavior of u and v of NS equation in 4 at $t = 0.05$ with parameters $\alpha = 1. g = 0. \rho_0 = 0.$

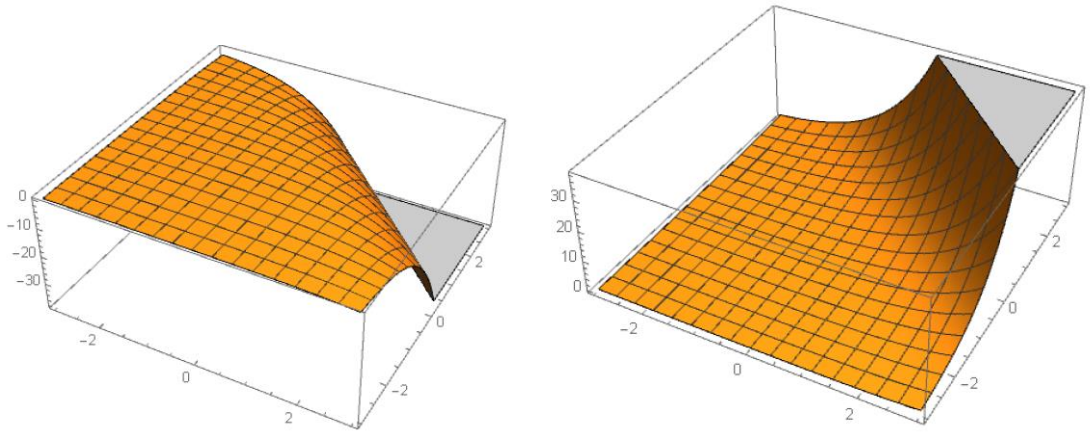


Figure 6: The behavior of u and v of NS equation in 4 at $t = 0.05$ with parameters $\alpha = 0.5. g = 0. \rho_0 = 0.5$

Consider time-fractional order three dimensional (4) with $g_1 = g_2 = g_3 = 0.$ subject to the initial condition:

$$u(x.y.z.0) = -0.5x + y + z. \quad v(x.y.z.0) = x - 0.5y + z.$$
$$w(x.y.z.0) = x + y - 0.5z. \tag{24}$$

Using RVIM on the above two equations. we obtained the following recurrence relation:

$$
\begin{aligned}
&u_{n+1}(x.y.t) = f_0(x.y.t)\\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_n\frac{\partial u_n}{\partial x} - v_n\frac{\partial u_n}{\partial y} - w_n\frac{\partial u_n}{\partial z} + \rho_0\left(\frac{\partial^2 u_n}{\partial x^2}+\frac{\partial^2 u_n}{\partial y^2}+\frac{\partial^2 u_n}{\partial z^n}\right)\right]\mathrm{d}\tau\\
&v_{n+1}(x.y.t) = g_0(x.y.t)\\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_n\frac{\partial v_n}{\partial x} - v_n\frac{\partial v_n}{\partial y} - w_n\frac{\partial v_n}{\partial z} + \rho_0\left(\frac{\partial^2 v_n}{\partial x^2}+\frac{\partial^2 v_n}{\partial y^2}+\frac{\partial^2 v_n}{\partial z^n}\right)\right]\mathrm{d}\tau\\
&w_{n+1}(x.y.t) = g_0(x.y.t)\\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_n\frac{\partial w_n}{\partial x} - v_n\frac{\partial w_n}{\partial y} - w_n\frac{\partial w_n}{\partial z} + \rho_0\left(\frac{\partial^2 w_n}{\partial x^2}+\frac{\partial^2 w_n}{\partial y^2}+\frac{\partial^2 w_n}{\partial z^n}\right)\right]\mathrm{d}\tau
\end{aligned}
\tag{25}
$$

for $n = 0$ we obtain as:

$$
\begin{aligned}
&u_1(x.y.t) = f_0(x.y.t)\\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_0\frac{\partial u_0}{\partial x} - v_0\frac{\partial u_0}{\partial y} - w_0\frac{\partial u_0}{\partial z} + \rho_0\left(\frac{\partial^2 u_0}{\partial x^2}+\frac{\partial^2 u_0}{\partial y^2}+\frac{\partial^2 u_0}{\partial z^0}\right)\right]\mathrm{d}\tau\\
&v_1(x.y.t) = g_0(x.y.t)\\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_0\frac{\partial v_0}{\partial x} - v_0\frac{\partial v_0}{\partial y} - w_0\frac{\partial v_0}{\partial z} + \rho_0\left(\frac{\partial^2 v_0}{\partial x^2}+\frac{\partial^2 v_0}{\partial y^2}+\frac{\partial^2 v_0}{\partial z^0}\right)\right]\mathrm{d}\tau\\
&w_{n+1}(x.y.t) = h_0(x.y.t)\\
&+\frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}\left[-u_0\frac{\partial w_0}{\partial x} - v_0\frac{\partial w_0}{\partial y} - w_0\frac{\partial w_0}{\partial z} + \rho_0\left(\frac{\partial^2 w_0}{\partial x^2}+\frac{\partial^2 w_0}{\partial y^2}+\frac{\partial^2 w_0}{\partial z^2}\right)\right]\mathrm{d}\tau
\end{aligned}
\tag{26}
$$

by simplifying we obtain that:

$$
\begin{aligned}
u_1(x.y.t) &= -0.5x + y + z + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(-2.25x)\mathrm{d}\tau = -0.5x + y + z - \frac{2.25xt^{\alpha}}{\Gamma(1+\alpha)}\\
v_1(x.y.t) &= x - 0.5y + z + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(-2.25y)\mathrm{d}\tau = x - 0.5y + z - \frac{2.25yt^{\alpha}}{\Gamma(1+\alpha)}\\
w_1(x.y.t) &= x + y - 0.5z + \frac{1}{\Gamma(\alpha)}\int_0^t (t-\tau)^{\alpha-1}(-2.25z)\mathrm{d}\tau = x + y - 0.5z - \frac{2.25zt^{\alpha}}{\Gamma(1+\alpha)}
\end{aligned}
$$

recently we get:

$$
\begin{aligned}
u(x.y.z.t) &= \lim_{n\to\infty} u_n(x.y.z.t) = -0.5x + y + z - \frac{2.25}{\Gamma(1+\alpha)}xt^{\alpha} + \frac{2(2.25)}{\Gamma(1+2\alpha)}(-0.5x + y + z)t^{2\alpha}\\
&-\frac{(2.25)^2}{\Gamma(1+3\alpha)}\left(4 + \frac{1+2\alpha}{(\Gamma(1+\alpha))^2}\right)xt^{3\alpha}\\
&+\frac{(2.25)^2}{\Gamma(1+4\alpha)}\left(8 + \frac{2\Gamma(1+2\alpha)}{\Gamma(1+\alpha)^2} + \frac{4(\Gamma(1+3\alpha))}{\Gamma(1+\alpha)\Gamma(1+2\alpha)}\right)(-0.5x + y + z)t^{4\alpha} +\\
v(x.y.z.t) &= \lim_{n\to\infty} v_n(x.y.z.t) = x - 0.5y + z - \frac{2.25}{\Gamma(1+\alpha)}yt^{\alpha} + \frac{2(2.25)}{\Gamma(1+2\alpha)}(x - 0.5y + z)t^{2\alpha}\\
&-\frac{(2.25)^2}{\Gamma(1+3\alpha)}\left(4 + \frac{1+2\alpha}{(\Gamma(1+\alpha))^2}\right)yt^{3\alpha}\\
&+\frac{(2.25)^2}{\Gamma(1+4\alpha)}\left(8 + \frac{2\Gamma(1+2\alpha)}{\Gamma(1+\alpha)^2} + \frac{4(\Gamma(1+3\alpha))}{\Gamma(1+\alpha)\Gamma(1+2\alpha)}\right)(x - 0.5y + z)t^{4\alpha} + \cdots\\
w(x.y.z.t) &= \lim_{n\to\infty} w_n(x.y.z.t) = x + y - 0.5z - \frac{2.25}{\Gamma(1+\alpha)}zt^{\alpha} + \frac{2(2.25)}{\Gamma(1+2\alpha)}(x + y - 0.5z)t^{2\alpha}\\
&-\frac{(2.25)^2}{\Gamma(1+3\alpha)}\left(4 + \frac{1+2\alpha}{(\Gamma(1+\alpha))^2}\right)zt^{3\alpha}\\
&+\frac{(2.25)^2}{\Gamma(1+4\alpha)}\left(8 + \frac{2\Gamma(1+2\alpha)}{\Gamma(1+\alpha)^2} + \frac{4(\Gamma(1+3\alpha))}{\Gamma(1+\alpha)\Gamma(1+2\alpha)}\right)(x + y - 0.5z)t^{4\alpha} + \cdots
\end{aligned}
$$

which is the required exact solution. For $\alpha = 1.$ we have:

$$\begin{cases} u(x.y.z.t) & = (-0.5x + y + z)(1 + 2.25t^2 + (2.25)^2t^4 + \cdots) - 2.25xt(1 + 2.25t^2 + \cdots) \\ & = \frac{-0.5x+y+z-2.25xt}{1-2.25t^2}. \\ v(x.y.z.t) & = (x - 0.5y + z)(1 + 2.25t^2 + (2.25)^2t^4 + \cdots) - 2.25yt(1 + 2.25t^2 + \cdots) \\ & = \frac{x-0.5y+z-2.25yt}{1-2.25t^2}. \\ v(x.y.z.t) & = (x + y - 0.5z)(1 + 2.25t^2 + (2.25)^2t^4 + \cdots) - 2.25zt(1 + 2.25t^2 + \cdots) \\ & = \frac{x+y-0.5z-2.25zt}{1-2.25t^2}. \end{cases}$$

(27)

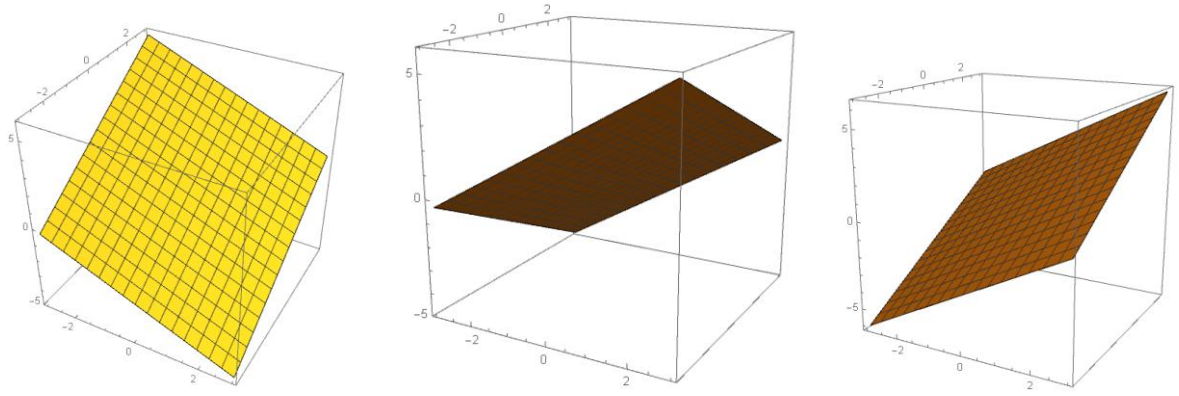


Figure 7: The velocity profile $(u.v.w)$ of NS equation in 6 at $t = 0.1$. $z = 0.5$ with $\alpha = 1$.

4 Conclusion

In this paper. Reconstruction Variational Iteration method is adopted for the numerical simulation of time-fractional model of Navier-Stokes equations with initial conditions. The fractional derivative is considered in the Caputo sense. The analytical results have been given in terms of a power series. Three test problems are carried out in order to validate and illustrate the efficiency of the method. The proposed solutions agree excellently with HPM [13] and ADM [14]. and are approximated without any discretization. transformation. perturbation. or restrictive conditions. However. the performed calculations show that the described method needs very small size of computation in comparison with HPM [13] and ADM [14]. Small size of computation contrary to the other schemes. is the strength of the scheme.

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ПРОГРЕСС БИОТЕХНОЛОГИЙ КОНТЕКСТЕ ФИЛОСОФСКО-ПРАВОВОГО ОСМЫСЛЕНИЯ

Замира Мухамеджановна Мухамедова
Доктор философских наук, профессор кафедры социальных и гуманитарных наук с курсом биоэтики, Ташкентский Государственный Стоматологический Институт

АННОТАЦИЯ

В статье рассмотрена актуальная взаимосвязь развития биотехнологий, в том числе биомедицинских с формированием биоэтики, биомедицинского права в историческом контексте философско-правового осмысления тенденций формирования биополитики и биоэкономики.

Ключевые слова: биотехнологии, биополитика, биоэкономика, биоэтика, биомедицинское право.

ABSTRACT

The article considers the actual relationship between the development of biomedical technologies and the formation of bioethics, biomedical law in the historical context of the philosophical and legal understanding of trends in the formation of biopolitics and bioeconomics.

Keywords. bioethics, biomedical law, biopolitics, bioeconomics, biocapitalism.

ВВЕДЕНИЕ

Методология биоэтики в Узбекистане разворачивается в большей степени в философском, нежели в правовом поле, сосредотачиваясь традиционно на таких этических принципах, которые пришли в медицину: информированное согласие, автономия личности, благодеяние, справедливость. Философы разрабатывают и «внедряют» категориальный аппарат, решают теоретические и прикладные аспекты взаимодействия в системе «пациент — медицинский корпус», изучают философские проблемы медицины: проблемы жизни и смерти, отчужденности, суицидов и т. д. Нормы биоэтики лежат в основе многих правовых норм. Данный уровень аргументации в этой методологии является необходимым, но не достаточным чтобы решать биоэтические дилеммы. Первичность нравственности прямо способствует развитию и

совершенствованию права и всего общества, самих людей в их взаимосвязи и взаимодействии. Их защита, сохранение здоровья и жизни составляют важнейшие задачи биологии и медицины, права, без участия которого не может быть решен ни один сколько-нибудь крупный вопрос в обществе и государстве.

МАТЕРИАЛЫ И МЕТОДЫ

Как известно, впервые понятие биополитики упоминается в 1920 г в работах шведского политолога, теоретика Рудольфа Челлена[1]. Французский философ Мишель Фуко в своих трудах, посвященных становлению властных отношений и их развитию, разрабатывает ключевые теоретико-методологические принципы и положения, которые впоследствии становятся основой для многих современных теорий[2]. Концепт «биовласть» в политической философии принято связывают с именем М. Фуко. Философская концепция биополитики М. Фуко была сформулирована в 1970-х гг, ее особенностью стало понимании биополитики как системы, которая учитывает пропорцию рождений и смертей, уровень воспроизводства и рост населения[3]. Основными направлениями практической реализации биополитики М. Фуко называл общественную гигиену, контроль над рождаемостью и смертностью, поддержку инвалидов, а также меры по охране окружающей среды и контролю над эпидемиологической ситуацией [4]. Концепция биополитики М.Фуко получила свое развитие в работах современных философов: Дж. Агамбена, А. Негри, Р. Эспозито, Дж.-А. Мбембе. Философский аспект биополитики характеризуется системным подходом к феномену биовласти, учитывающим разнообразные междисциплинарные связи: социокультурные, биологические, экологические, экономические и др. М. Фуко писал, что «начиная с XVIII в. пытались рационализировать проблемы, поставленные перед правительственной практикой феноменами, присущими всем живущим, составляющим население...»[5]. Под этим понимается продолжительность жизни, рождаемость и т. д. Биополитика становится процессом, ориентированным на управление населением и связанным с определенной политической идеей. Отдельное место занимает у Фуко медицинское знание, которое он связывает с прогрессом в области практик биовласти в Европе в начале XVIII века. В своей лекции «Рождение социальной медицины» (1974) ученый выделяет тот факт, что, начиная с XVIII века тело человека, интегрируется в сферу медицинских услуг, а это

приводит к развитию **экономики здравоохранения**. Современная медицина подразумевает под собой социальную медицину, которая заключает в себе технологии социального тела. Главным запросом человека становится желание долгой и качественной жизни, что ложится в основу биовласти. По мнению М. Фуко, начиная с XVIII в. государство рассматривает нацию как единое коллективное биологическое тело, которым можно управлять, санкционируя те или иные телесные пратики посредством системы здравоохранения, физической культуры, демографической политики, политики в сфере сексуальных отношений.

Одной из главных в биополитической позиции Р. Эспозито [6]. является концепция всеобщей иммунизации, содержание которой гораздо шире привычного медицинского объема этого понятия. У Р. Эспозито это — система построения различных материальных и символических сфер (иммунитетов), призванных разделить области «своего» и «чужого» и защитить индивида от внешних воздействий. При этом иммунитет трактуется Р. Эспозито как «власть сохранять жизнь» [7]. Терминологическая система иммунологии в этом случае используется как методологическое основание для анализа целого ряда социально-политических процессов. Проблемы биополитики являются междисциплинарной областью исследования, применения биополитических принципов и методов приобрели особую актуальность в условиях Covid-19 в связи с глобальным политическим и социально-экономическим кризисом, изучение которого даст аргументы и факты в понимании биополитической концепции. Как отмечают специалисты, «пандемия коронавируса COVID-19 стала неожиданным и серьезным шоком для большинства мировых стран.

В 60–70-е гг. XX в. можно говорить о возникновении совокупности различных биополитических течений, таких как: *экологическая* (развивавшаяся на базе Римского клуба[8]) и *технологическая* (развивавшаяся на базе технологий, применяемых в генетических и репродуктивных исследованиях), в рамках биоэтики [9] биополитики [10], а также *биополитология* в цели которой входило создание государства, оптимально распределяющего ресурсы для рационального удовлетворения потребностей человека как биологического, общественного и культурного представителя своего вида. Новая парадигма биополитики находится ещё в процессе своего становления.

Для объяснения новой социально-экономической реальности, которую вызвала к жизни биотехнологическая

революция, предлагаются самые разные определения(например,

«биокапитализм» – капитализм, созданный прогрессом наук о жизни. [11]

Прогресс биотехнологий несомненно повлиял на экономику, породив к жизни биотехнологическую индустрию. Биоэтика как феномен и ее значение в регулировании зарождающейся биоэкономики рассматривается в работах философов и юристов [12]

В новой социально-экономической ситуации людям приходится зарабатывать не только трудом в его традиционном понимании, но и всей своей жизнью, превращая всю ее без остатка в бизнес. В условиях биокапитализма не только умственный труд, но и труд посредством использования избытка жизни может быть напрямую связан с областью биотехнологического производства- «клиническим трудом». Примерами клинического труда выступает женский репродуктивный труд – практики предоставления ооцитов и суррогатного материнства, как на альтруистической, так и коммерческой основе, полностью бесплатный женский регенеративный труд, связанный с предоставлением биоматериалов для регенеративной медицины – прежде всего пуповинной крови и содержащихся в ней стволовых клеток, а также работа, связанная с участием в клинических испытаниях новых лекарств. Другая форма клинического труда – регенеративный труд, связанный с предоставлением различных регенеративных тканей для биомедицинских исследований и лечебных целей. Согласно выводам Роуза, если в XVIII и XIX вв. целью биополитики были, прежде всего, контроль за человеческими существами и популяциями, обеспечение жизни (рождаемости) и предотвращение смерти (эпидемий), а на протяжении большей части XX в. биополитика была направлена на заботу о качестве населения – для этого использовались, прежде всего, технологии евгеники, то к началу XXI в. появилась «биополитика в отношении самой жизни» – власть стала создавать условия для того, чтобы управлять жизненными процессами на самом фундаментальном уровне – клеточном, генном, молекулярном. [13] Средства для такого управления были предоставлены науками о жизни – генетический скрининг, репродуктивные технологии, трансплантация органов, генетические модификации организмов, использование психотропных лекарств. Некоторые из средств для управления находятся еще «за ближайшим поворотом» – персонализированные лекарства, генная инженерия, ксенотрансплантация. Все эти технологии в равной степени

являются не только воплощением биомедицинского знания, но и политическими технологиями новейшей эпохи. Это такие же политические технологии, как и технологии вакцинации, которые использовались более двух столетий назад.

Нюрнбергский процесс показал всему человечеству, что этические нормы уже не в состоянии регулировать деятельность врача. Обществу в целом, медицинскому сообществу нужны четкие нормы права, регулирующие права и обязанности врача и пациента, а также нормы, посредством которых обеспечивалась бы охрана этих прав. В 1967 г. под влиянием интеграционных процессов и с целью решения общих проблем правового регулирования медицинской деятельности, правовых проблем охраны здоровья населения сздается Всемирная ассоциация медицинского права (ВАМП), объединившая в своих рядах врачей, юристов, специалистов по биэтике.

Этические дилеммы, возникающие в медицине и связанных с ней научных дисциплинах, помогли гуманизировать право.

Позитивный эффект дает привлечение экономического, философского, этического, социологического, исторического и иных отраслей знания.

Правовое регулирование охраны здоровья и жизни людей представляет собой важнейшую сферу правотворчества и правореализации. В условиях модернизации правовых основ здравоохранения правовое регулирование биомедицинских технологий выходит на первый план, о чем свидетельствует разработка проекта нового кодекса об охране здоровья граждан РУ. Всеобщая декларация о биоэтике и правах человека признает взаимосвязь между этикой и правами человека призывает и обязывает государства-члены, в том числе и Республику Узбекистан, использовать достижения в области биологических и медицинских наук, новейших технологий на основе уважения прав человека и основных свобод, закрепить основополагающие принципы международного права в сфере биоэтики в Конституции и законодательстве РУ. В Узбекистане опубликован проект Кодекса охраны здоровья граждан Республики Узбекистан, определяющий правовые, организационные и экономические основы охраны здоровья граждан; права и обязанности человека и гражданина в сфере здравоохранения и гарантии реализации этих прав; полномочия и ответственность региональных и местных органов власти РУ в сфере охраны здоровья граждан; права и обязанности медицинских организаций при осуществлении деятельности в сфере охраны здоровья граждан, а также права и обязанности

медицинских и фармацевтических работников [14]

Острые дискуссии по отдельным вопросам, например о допустимости эвтаназии, о защите прав эмбрионов. Современное состояние законодательства о здравоохранении и практики его реализации, сопровождается анализом достижений и просчетов, выявлением пробелов и предложений по их ликвидации, разработкой в возможных случаях прогнозов на будущее, для того чтобы человечество не столкнулось неожиданно с проблемой, требующей сверхсрочного правового решения, будучи к ней не подготовленным, например, клонированием людей, созданием искусственного человека и т.п.

Медицинское право является очень молодой отраслью международного права, которое активно развивается последние двадцать лет в развитых странах. В настоящее время нормы медицинского права становятся неотъемлемой частью международного н внутригосударственного законодательства. Сегодня международное медицинское право объединяет социальные права человека, охватывая более обширный круг вопросов, чем медицинское законодательство конкретного государства. [15] Главная задача медицинского права - создать систему здравоохранения, регулируемую основным законодательством н другими правовыми актами, позволяющую оказывать необходимую медицинскую помощь всему населению н обеспечивающую профилактику н диагностику болезней, специальные меры по защите здоровья декретируемых категорий населения и общие меры безопасности продуктов питания н состояния окружающей среды.

Медицинское право не приобрело столь глобального значения как, например, экологическое, но развитие международной кооперации более чем плодотворно и в этой области научного юридического знания и юридической практики.

ВЫВОДЫ

В современном мире биомедицинские технологии получают настолько стремительное развитие, что об их достижениях вольно или не вольно осведомлен практически каждый человек. ГМО, клонирование, суррогатное материнство и др. Вместе с развитием биомедицины происходит пересмотр многих базовых ценностей в праве. В первую очередь, затрагиваются основные права человека. Причем налицо серьезная тенденция – трансформация содержания прав человека. Несмотря на выделенные угрозы, правой аспект современной

биомедицины находится в числе малоизученных проблем юридической науки как в РУ, так и за рубежом.

Право и законодательство сильно отстают от «вызовов» биомедицины, не дают своевременного ответа имеющимся инструментарием (правовой нормой, определяющей границы должного поведения, обеспеченной возможностью государственного принуждения к ее исполнению, соблюдению) на ряд серьезных вопросов современности. [16]

Общественные отношения в системе «медицинский корпус (врач, провизор, медицинская сестра) – пациент» по поводу особого блага – жизни и здоровья стали с этого времени в центре правовых и смежных с правом исследований (например, философской антропологии, биоэтики), составили сердцевину, основу но- вой отрасли права – медицинского права. В предмет исследуемой отрасли права стали включать и иные общественные отношения, а под исследуемой отраслью понимать систему правовых норм, регулирующих общественные отношения, возникающие по поводу охраны здоровья граждан, медицинской деятельности, а равно общественные отношения в процессе функционирования и развития сферы охраны здоровья граждан.

В настоящее время предмет биомедицинского права, оформившись изначально, как группа отношений между медицинским корпусом и пациентом (физическим лицом), расширяет свои границы за счет и иных общественных отношений, обеспечивающих эту связь (организационные, управленческие, по лекарственному обеспечению и др.).Биомедицинское право как наука есть совокупность правовых знаний, накапливаемых в результате научных исследований и обобщения медицинской (клинической, экспериментальной и др.) и правоприменительной (в первую очередь судебно-следственной и договорной) практики. Наука биомедицинского права также немыслима без связи с другими общественными науками, в том числе философией, социологией, политологией, историей, экономикой. Современное развитие общества характеризуется новыми открытиями в области естественных наук, которые касаются жизни человека. Кроме того, наблюдается тенденция все большего взаимодействия естественных наук с общественными, в частности с наукой о праве. В конечном счете это привело к необходимости осмысления человеческой жизни в категориях и понятиях юридической науки и необходимости правового регулирования жизни человека от его зачатия до смерти. В связи с этим образовалось новое направление в праве и

юридической науке – биоюриспруденция [17]

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SITRATSINTAZA VA UNI KASALLIKLARDA O‘ZGARISHI

O. T. Nishanbayeva
O‘zbekiston davlat jismoniy tarbiya va sport universiteti, Sport tibbiyoti va bioximiya kafedrasi

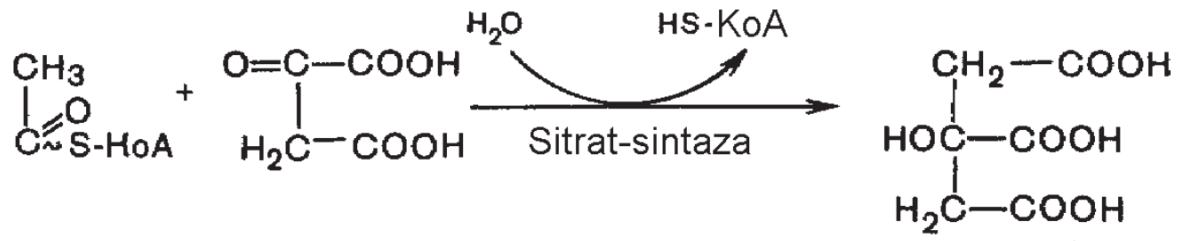
ANNOTATSIYA

Ushbu maqolada Krebs siklinida muhim o‘rin egallagan sitratsintaza fermentining ahamiyati va uni ba’zi kasalliklarda o‘zgarishlari adabiyotlar tahlil asosida o‘rganilgan va tahlil qilingan. Tadqiqotni olib borish uchun “sitransintaza”, “limon kislota sikli”, “uchkarbon kislota sikli”, “Krebs sikli” kabi kalit so‘zlarning o‘zbek, rus va ingliz tilidagi tarjimasi asosida axborot bazalarida qidiruv amalga oshirildi va topilgan 85 dan ortiq maqolalarning mazmuni bilan tanishilda va bevosita mavzuga taaluqli bo‘lganlari o‘rganildi va tahlil qilindi. Olingan natijalar aynan sitratsintaza fermentini chuqur o‘rganishga qaratilgan ishlar ko‘p emasligini, ushbu ferment hujayrada muhim vazifalarishini bajarishini hamda turli patologik holatlarda uning o‘zgarishini ko‘rsatadi. O‘rganilgan adabiyotlar asosida xulosa qilib aytish mumkinki sitratsintaza fermenti patologik holatlarda o‘zgarib turadi va bundan kasalliklarni erta tashxislashda marker sifatida hamda davolashni patogenetik mexanizmini tushunish uchun foydalanish mumkin.

Kalit so‘zlar. Sitransintaza, limon kislota sikli, uchkarbon kislota sikli, Krebs sikli.

KIRISH

Limon kislotasi (Krebs) sikli, elektron tashish zanjiri bilan birgalikda modda almashinuvining oxirgi fazasi hisoblanadi va oksidlanuvchi moddadan 60-70% energiyani ajratib chiqaradi. Krebs sikli, elektron tashish zanjiri bilan birgalikda modda almashinuvining oxirgi fazasi hisoblanadi va oksidlanuvchi moddadan 60-70% energiyani ajratib chiqaradi. Krebsning limon kislota sikli uglevodlar, yog‘lar va aminokislotalar parchalanishidagi umumiy yo‘l hisoblanadi. Uglevodlar bilan yog‘lar bu siklga atsetil-KoA shaklida, aminokislotalar esa – a-ketoglutarat, suksinat va fumarat shaklida qo‘shiladi. Krebs sikli yopiq metabolitik yo‘l bo‘lib, 8 ta alohida reaksiyalardan iborat. Oksaloatsetat bu reaksiyada boshlang‘ich hamda oxirgi mahsulot bo‘lib hisoblanadi. Siklning birinchi reaksiyasida atsetil-KoAning oksaloatsetat bilan kondensatsiya reaksiyasi natijasida limon kislotasi hosil bo‘ladi. Bu reaksiyani sitratsintaza fermenti katalizlaydi [14].



Atsetil-KoA Oksaloatsetat Sitrat

Limon kislota siklining funksional tezligi hujayraning ATF ga bo‘lgan ehtiyojiga moslashgan. Boshqarishning birinchi reaksiyasi oksaloatsetat bilan atsetil-KoAdan sitratning sintezlanishidir. Sitrat-sintaza fermentining allosterik ingibitori ATFdir. ATF miqdorining ko‘payishi sitrat hosil bo‘lishini kamaytiradi [14].

Sitransintaza (EC: 2.3.3.1) – uch karbon kislota (Krebs) siklining atsetil-kofermenta A va oksaloatsetatdan limon kislotasini sintez bo‘lishini katalizlaydigan muhim fermentlaridan biri [15, 11]. Eukariot hujayrlalarda sitransintaza mitoxondryalarda sintez qilinadi. Sitransintaza deyarli barcha tirik mavjudotlarning hujayralarida uchraydi. Sitratsintaza sintetik funksiyasidan tashqari boshqa qator vazifalarni bajradi, xususan Krebs siklini boshqarishda, sitratlarni mitoxondryalardan sitoplazmaga tashishga yordam beradi. Olib borilgan tadqiqotlar sitratsintazani nafas olish omiliga, mushaklardagi mitoxondryalarda energiya sarfini boshqarishga, insonlarda limfotsitlarni o‘sishiga va boshqa kasalliklarga boshqaruvchi ta’sir qilishini ko‘rsatadi. [13, 2].

Sitransintazani turli patologik holatlarda o‘zgarishini o‘rganishga bahishlangan adabiyotlarni o‘rganish hamda ularni umumlashtirgan holda baholash.

TADQIQOT MATERIALLARI VA USULLARI

Tadqiqotni olib borish uchun “sitransintaza”, “limon kislota sikli”, “uchkarbon kislota sikli”, “Krebs sikli” kabi kalit so‘zlarning o‘zbek, rus va ingliz tilidagi tarjimasi asosida axborot bazalarida qidiruv amalga oshirildi va topilgan 85 dan ortiq maqolalarning mazmuni bilan tanishilda va bevosita mavzuga taaluqli bo‘lganlari o‘rganildi va tahlil qilindi.

OLINGAN NATIJALAR VA ULARNING MUHOKAMASI

Mavzuga oid adabiyotlar tahlili shuni ko‘rsatadiki patologik holatlarda sitratsintazani o‘rganish asosan hayvonlarda olib borilgan. Buning asosiy sababi tadqiqotlarni bevosita insonlarda olib borish etik me’yor va qoidalarga to‘g‘ri kelmasligi bilan bog‘liqligida.

Hayvonlarda olib borilgan tadqiqotlar sitratsintaza o‘tkir stress ta’sirida ham o‘zgarishini ko‘rsatadi. Kalamushlarda olib borilgan tadqiqotlar o‘tkir stress natijasida sitratsintaza faolligining ortishi jinslar orasida farq qilishini ham ko‘rsatib, erkaklarida 25%, ayollarida 60% ga ortib, jinslar orasidagi farq deyarli 2 barobarni tashkil qilgan [2].

Sitratsintaza faolligining pasayishi metaxondryalar buzilishiga olib kelishi va o‘z navbatida mitoxondralar funksiyasi buzilishiga bog‘liq bo‘lgan metabolik o‘zgarishlar bosh miya, miokard va skelet mushaklari kabi energiya ehtiyoji yuqori bo‘lgan a’zolarning zararlanishiga olib kelishi mumkin [10, 8]. Kalamushlarda olib borilgan eksperimental tadqiqot natijalari bosh miya fokal eshimiyasida, bosh miya jarohatlarida va miokard ishemiyasida sitratsintaza faolligining pasayishi aniqlangan. Mualliflarning qarashlariga ko‘ra sitratsintaza faolligini oshirishga qaratilgan davolash tadbirlari eshimiya maydonini kamaytirishga yordam beradi [6, 3, 5].

Kalamushlarda olib borilgan tadqiqotlar alkogol kardiomipatiyada ham subsarkolemma mitoxondryalarida sitransintaza faolligi 54,9 % ga oshgan bo‘lsa, interfibrilyar mitoxondryalarda aksincha bo‘lib sitratsintaza faolligi 52,1% kamayganligini ko‘rsatadi. Bunda yurak mushaklariga energiya yetishmovchiligi kuzatilib, miokardni zararlashishi kuchayib ketishi mumkin [1].

Boshqa bir olib borilgan tadqiqotda esa eksperimental alsgeymer kasalligi chaqirilgan kalamushlar gippokampida mitoxondryalar funksional faolligi nazorat guruhiga qaraganda sezilarli pasaygan. Tadqiqotchilarning bunday xulosaga kelishga alsgeymer rivojlantirilgan kalamushlarda mitaxondrya faolligini ko‘rsatuvchi markerlaridan biri bo‘lgan sitratsintaza faolligining nazorat guruhidagilarga qaraganda 88,5% ga kamayshi sabab bo‘lgan. Olingan natijalar asosida tadqiqotchilar Alsgeymer kasalligida mitoxondryalar buzilishini erta tashhislash uchun sitratsintaza faolligi o‘zgarishlarini aniqlashni maqsadga muvofiq degan xulosaga kelishgan [4].

Organizm turli tashqi ta’sirlar ostida bo‘lganda, masalan jarohatlarda, jarrohlik aralashuvlarida, yuqumli kasalliklar, sovuq, qo‘rquv va boshqalarda adenogipofiz qisqa vaqt ichida ko‘p miqdorda adrenokortikoid garmonlarini ajratadi. Ular buyrak usti beziga ta’sir qilishi natijasida katta miqdorda glyukokortikoidlar sintez qilinadi va ajratib chiqariladi [9]. Glyukokortikoidlar glyukoza va energiya almashinuvini yaxshilaydi, bu organizmni tsressga qarshi turishini ta’minlaydi [1]. Organizm uzoq vaqt davomida surunkali stress ta’siri ostida bo‘lganda kortikotropin-rilizing-gormon - adrenokortikoid garmon – glyukokortikoid tizimi faolligi oshib ketishi hisobiga markaziy nerv tizimi teskari ta’sirga javob bermagan holda adrenokortikoilarni ko‘p ajratishni boshlaydi. Adrenokortikoidlar buyrak usti beziga uzluksiz ta’sir ko‘rsatib, uning faolligini

oshiradi. Ushbu jarayonni meyorlashtirish uchun buyrak usti bezi o‘lchamlari kattalashib, ko‘p miqdorda glyukokortikoidlar ajratib chiqaradi. Bu sitratsintaza ekspressiyasini kuchaytirib, Krebs siklini va energiya metabolizmini rag‘batlantiradi, ATF-sintaza majmuasini va ATFaza faolligini kuchaytiradi, ATF ajralishi va energiya metabolizmiga olib keladi [12].

XULOSA

Olingan ma’lumotlar sitratsintaza turli patologik holatlarda o‘zgarib turishini ko‘rsatadi. Bu o‘zgarishlardan ba’zi mualliflar kasalliklarni erta aniqlashda marker sifatida foydalanish mumkin deb hisoblashsa, boshqalari patologik jarayonlarni oldini olish, davolash va asoratlarini yumshatishda sitransintaza faolligiga ta’sir qiluvchi vositalardan foydalanishni taklif qilishadi. Sitransintazani o‘rganishga qaratilgan tadqiqotlar asosan hayvonlarda olib borilgan bo‘lib qanchalik ishonarli va ijobiy natijalar bermasin, insonlar va hayvonlar orasida farq borligi, insonlarda klinik tadqiqotlar olib borish kerakligini ko‘rsatadi.

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ENHANCING LANGUAGE LEARNING: THE ADVANTAGES AND RECOMMENDATIONS OF PROJECT-BASED LEARNING FOR STUDENTS' DEVELOPMENT

Barno Djumanova
MBA student of Uzbekistan State World Languages University,
E-mail: barnodjumanova22@gmail.com

ABSTRACT

It is vivid that, for decades modern foreign language teaching pedagogy is expected to exploit various methods which have been approved by instructor, scholars. One of well-known model is Project-based learning. This paper purposes to explore importance of Project-based learning in higher education. Additionally, there is the research which was conducted among teachers of higher education in Uzbekistan, interview-based research which tries to find out the answer to the research question" What are the benefits of Project -based learning for students' development in higher education".

Keywords: PBL (Project- Based Learning), competence, communicative competence, Speaking, research, project, teacher, student

INTRODUCTION

Current pedagogical environment focuses on not only how to teach the language but also its prospective usage in real life situations. Because according to statistics and researches just teaching grammatical rules, tasks, tests might not mean that student will be capable of making conversation real life. For many years around the world, as well as In Uzbekistan educators are trying to create authentic (real) atmosphere for students in order to achieve their ability to speak fluently; develop their communicative competence and understand the meaning of at least the sentence in foreign languages. Teachers have been making experiments and using various methods, approaches in educational institutions: Audio-lingual method, Naturalistic Approach, Task-Based Learning, Communicative approach and one of them, Project-based learning approach. According to many scholars researches Project- based learning can help to develop learners' communicative competence. However, this term should be clarified.

PBL (**Project – Based Learning)** was developed by J. Dewey (1859-1952). Paying special attention to the need for the formation of reflex thinking, he argued that thinking is the

solution of problems, i.e. "problem solving" (1909). Dewey stated that project does not bring topics as verbal formulations to be remembered for students, but fetches conditions when students try their resourcefulness, ability to make right decisions and activity. Furthermore, Vygotsky claimed in his research that learning occurs through social interaction that motivated people to deal with the kind cognitive issues that are just slightly above their current levels of aptitude . He posits that concepts develop and understanding happens when individuals enter into discussion and meaningful interaction with more capable peers or teachers. These individuals can model problem solving, assist in finding solutions, monitor progress, and evaluate success (Tharpe RG, Gallimore R.1988) The project method is based on methods of activating learning, research methods. According to Patton (2012) Project Based-Learning point to learners designing, planning, and carrying out an extended project that produces a publicly- exhibited output such as a product, publication, or presentation. Also, Project -Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex question, problem, or challenge (Buck Institute for Education, 2014). This may include a single project or a "series of projects that require [students] to use diverse skills—such as researching, writing, interviewing, collaborating, or public speaking—to produce various work products, such as research papers, scientific studies, public-policy proposals, multimedia presentations, video documentaries, art installations, or musical and theatrical performances, for example" (Hidden curriculum, 2014, para. 1).

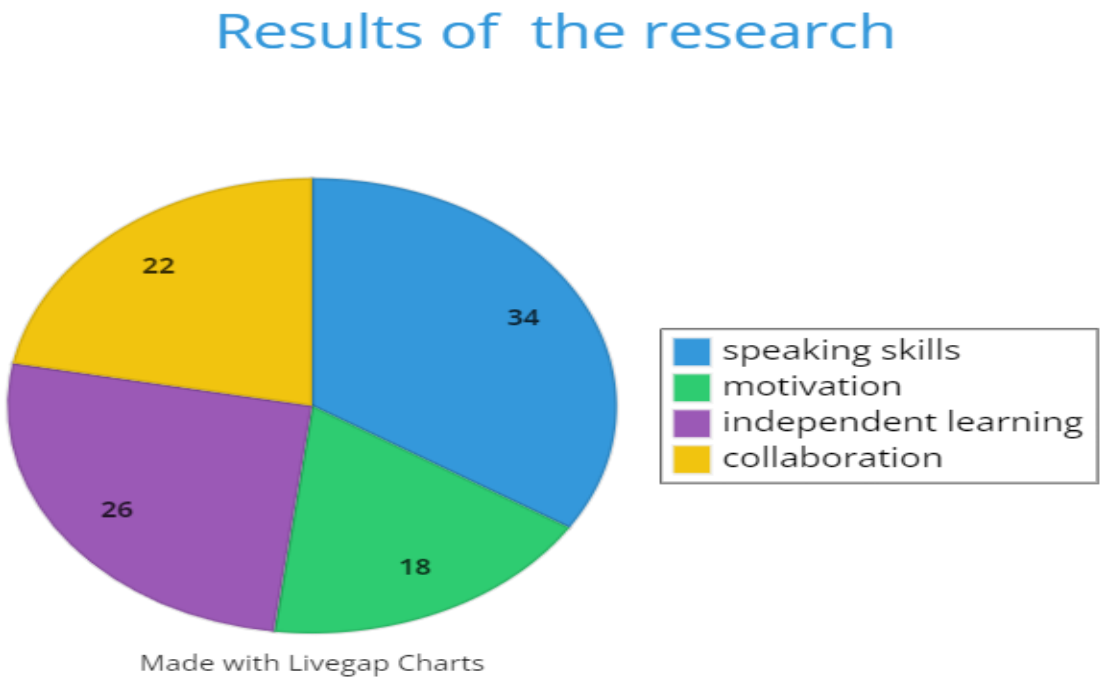
METHODOLOGY

This study is included in the qualitative research. The location of the research is Tashkent, Uzbekistan. Methods that researcher used in this study among 70 English teachers of higher education as a sample from the population. The interview was used to measure teachers' preference answers that respondents only answered according to their working experience objectively. The research question is " What are the benefits of Project -based learning for students' development in higher education ".All interviews were conducted via Telegram messenger online and teachers sent their response by recording their voice. Because of online interview it took less time to gather and analyze answers.

RESULTS

According to the recorded answers it was apparent that, project-based learning model is commonly used in Uzbek

curriculum. In particular among students of higher education have more ability to work on a projects, doing research and learn independently. Teachers direct students by giving separate topics for the small and whole groups and give instructions to conduct their projects, then teachers give opportunity for students to defense their projects: to speak about the project, values of the project, process and its results. Additionally, there are many aims to use Project-based learning for students which were emphasized in the interviews.Interviewers' goals have shown in the graph below:



In accordance with the segments of the pie-chart 34 percent of teachers consider that, project-based learning model can enhance students' speaking skills. Also, the percentage of 26 has shown students' independent learning which is approved by instructors. What is more, 22 percent teachers give positive comments about collaborative learning environment among students while doing projects. Finally, number 18 in the chart demonstrated that, doing projects serves to encourage students for learning the language and using it in real life.

DISCUSSION

As it is known from the research , project based learning has numerous benefits for students:

- it develops students' oral communicative competence. Consequently, students develop speaking skills as an indicator of

communicative proficiency in a foreign language. They can show what they have learned during the academic year while doing the project and delivering to the audience. Student can feel self -confidence during his/her speech

- motivate students to learn the language and its fluent usage. The project method makes it possible to inspire of learning, which is expressed in providing the student with conditions for working on the project and complexity of the task at an individual pace, which creates equal opportunities for the personal growth of all students.

- support students' independent learning Project work eliminates the student's dependence on the teacher by self-organization and self-study in the process of creating a specific product or solving a separate problem taken from real life. Therefore, on the project methodology when teaching a foreign language is to provide students have real autonomy and the possibility of showing initiative and independence in the process of project works.

- cultivate collaborative working among students. Actually projects require small ore whole group participation because of its multi-tasking principle. Students separate tasks according to their aptitude and take responsibilities for chosen part of the project. It helps to create a friendship atmosphere as well as enhance team-working, leadership and collaborative learning among students which are essential in their future life.

CONCLUSION

In conclusion, PBL emerges as a highly recommended approach for language instruction, offering numerous benefits for students' language proficiency and soft skill development. To maximize its advantages while addressing potential drawbacks, several key suggestions are essential. Firstly, ensuring seamless integration of PBL with the existing curriculum is crucial to maintain alignment with learning objectives. Secondly, establishing clear and objective assessment criteria enables fair evaluation of individual and group performances in project-based assessments. Equally important is providing teachers with adequate professional development and training to effectively guide and manage PBL classrooms. Gradual implementation, starting with smaller projects and progressively increasing their complexity, allows for a smooth transition for both educators and students. Additionally, resource planning should be carefully considered to provide the necessary materials and technology support. Encouraging student engagement by allowing them to choose projects related to their interests and fostering a supportive and inclusive classroom environment further enhances the

effectiveness of PBL. By heeding these recommendations, educators can fully harness the potential of Project-Based Learning to create an authentic and empowering language learning experience for their students.

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ПРОЕКТ НОВОГО КОДЕКСА «ОБ ОХРАНЕ ЗДОРОВЬЯ ГРАЖДАН» УЗБЕКИСТАНА И ЕГО ЭТИЧЕСКИЕ ПРИОРИТЕТЫ

Замира Мухамеджановна Мухамедова
Доктор философских наук, профессор кафедры социальных и гуманитарных наук с курсом биоэтики Ташкентский Государственный Стоматологический Институт

АННОТАЦИЯ

В Узбекистане опубликован проект Кодекса охраны здоровья граждан Республики Узбекистан[1]. Совершенствование законодательства в сфере здравоохранения предусмотрено указом Президента[2]. Актуальность ожидаемого события- принятия нового кодекса объясняется ситуацией, когда в стране действуют 76 законов и свыше 400 подзаконных актов, регулирующих отношения в сфере здравоохранения, которые кодекс должен объединить и включить в содержание правовую регламентацию накопившихся вопросов и проблем, которые не нашли своего отражения в 1996 году в законе об охране здоровья граждан.

Появление новой отрасли гражданского права - медицинского права является ответом на происходящие изменения в сфере охраны здоровья граждан и здравоохранения в законодательстве Узбекистана. В новом кодексе определены правовые, организационные и экономические основы охраны здоровья граждан; права и обязанности человека и гражданина в сфере здравоохранения и гарантии реализации этих прав; полномочия и ответственность региональных и местных органов власти РУ в сфере охраны здоровья граждан; права и обязанности медицинских организаций при осуществлении деятельности в сфере охраны здоровья граждан, а также права и обязанности медицинских и фармацевтических работников.

Проект документа содержит 200 статей и включает общую и специальную части. Общая часть раскрывает основные правила государственного управления здравоохранением, систему финансирования, цифровизацию, права и обязанности субъектов сферы. Специальная часть включает:

- профилактику инфекционных и неинфекционных заболеваний;
- правила оказания медицинской помощи;
- санитарно-эпидемиологическое благополучие населения;

- донорство и трансплантацию;
- фармацевтику, обращение лекарств и изделий медицинского назначения;
- образование и науку в области здравоохранения и другие вопросы.

Целью данного исследования было изучить возможность и необходимость объединения усилий институтов биоэтики, общественного здравоохранения и гражданского общества в направлении адекватного соответствия правил, принципов биоэтики новому кодексу.

Ключевые слова: биоэтика, общественное здоровье, соответствие нового кодекса нормам и правилам биоэтики, институты гражданского общества, политика здравоохранения, справедливая и качественная медицинская помощь, роль этических комитетов в обеспечении гарантий социальной защиты и безопасности здоровья в Узбекистане.

ABSTRACT

Uzbekistan has published a draft Code of Health Protection for Citizens of the Republic of Uzbekistan[1]. The improvement of legislation in the field of health care is provided for by a decree of the President[2]. The relevance of the expected event - the adoption of a new code is explained by the situation when the country has 76 laws and over 400 by-laws regulating relations in the healthcare sector, which the code should combine and include in the content of the legal regulation of the accumulated issues and problems that were not reflected in 1996 year in the law on the protection of public health.

The emergence of a new branch of civil law - medical law is a response to ongoing changes in the field of public health and healthcare in the legislation of Uzbekistan. The new code defines the legal, organizational and economic foundations for protecting the health of citizens; the rights and obligations of a person and a citizen in the field of healthcare and guarantees for the implementation of these rights; powers and responsibility of regional and local authorities of the Republic of Uzbekistan in the field of protecting the health of citizens; the rights and obligations of medical organizations in carrying out activities in the field of protecting the health of citizens, as well as the rights and obligations of medical and pharmaceutical workers.

The draft document contains 200 articles and includes general and special parts. The general part reveals the basic rules of public health management, the financing system, digitalization, the rights and obligations of the subjects of the sphere. Special part includes:

- prevention of communicable and non-communicable diseases;
- rules for the provision of medical care;
- sanitary and epidemiological welfare of the population;
- donation and transplantation;
- pharmaceuticals, circulation of medicines and medical products;
- education and science in the field of health care and other issues.

The purpose of this study was to study the possibility and necessity of combining the efforts of bioethics institutions, public health and civil society in the direction of adequate compliance of the rules, principles of bioethics with the new code.

Keywords: bioethics, public health, compliance of the new code with the norms and rules of bioethics, civil society institutions, health policy, fair and high-quality medical care, the role of ethics committees in ensuring guarantees of social protection and health security in Uzbekistan.

ВВЕДЕНИЕ

Анализ информации, полученной из личного опыта, конференций, научной литературы, поиск информации по исследованиям

Основными задачами проекта Кодекса охраны здоровья граждан Республики Узбекистан являются:

обеспечение государственных гарантий прав граждан на охрану здоровья; оказывать гражданам безопасную, эффективную и качественную медицинскую помощь; введение понятийный аппарат наиболее общих и значимых для всей сферы здравоохранения понятий и определении, таких, как "здоровье", "лечение", "профилактика", "диагностика", "болезнь," и пр., которые требуют однозначного толкования для формирования единой правоприменительной практики. Также установлены основные принципы охраны здоровья:

- соблюдение прав граждан в сфере охраны здоровья и обеспечение связанных с этими правами государственных гарантий;
- приоритет интересов пациента при оказании медицинской помощи;
- приоритет охраны здоровья детей;
- социальная защищенность граждан в случае утраты здоровья;
- ответственность органов государственной власти и органов местного самоуправления, должностных лиц организаций за обеспечение прав граждан в сфере охраны здоровья;
- доступность и качество медицинской помощи;

- недопустимость отказа в оказании медицинской помощи;
- приоритет профилактики в сфере охраны здоровья;
- соблюдение врачебной тайны.

В области здравоохранения биоэтика профессионально наводит мосты между институциональной и государственной политикой, создавая взаимосвязь между достижениями, обязанностями и тем, что должно быть сделано, когда сфера ответственности преобладает в качестве руководящего принципа этики.[3]. В этом контексте, поскольку общественное здравоохранение и биоэтика включают в свой анализ социальные и субъективные детерминанты, рекомендуется проводить действия в области общественного здравоохранения, используя расширенное и интегрированное представление о взаимосвязи между человеком и здоровьем. Сущность этики общественного здравоохранения касается морального обоснования политики, программ и законов, направленных на защиту и укрепление здоровья населения.

МАТЕРИАЛЫ И МЕТОДЫ

Парадигма социального контекста развития биоэтики, помимо образовательной составляющей в медицинских вузах, формирующих мировоззрение и биоэтическую культуру будущих врачей в целом, включает в себя компонент практической реализации этой важной задачи в обществе. Он заключается в продвижении и обсуждении биоэтического дискурса в обществе посредством усилий организации общественного здравоохранения, институтов гражданского общества с целью институтов предоставления более качественной, справедливой медицинской помощи, решения биоэтических проблем, принятия законов и соответствующих правовых норм, работой этических комитетов в обеспечении гарантий социальной защиты и безопасности здоровья в Узбекистане.

Нормативное регулирование и обеспечение прав граждан на квалифицированную медицинскую помощь в современном правовом государстве обеспечивается медицинским правом и биомедицинской этикой. Они тесно взаимосвязаны, однако в Узбекистане механизм этой связи остается проблемой, которая стоит особенно остро, поскольку и правовая система, и система здравоохранения находятся в стадии реформирования. Кроме того, само медицинское право в нашей стране только формируется как самостоятельная отрасль. Что касается моральной регуляции этой сферы, то она должна быть основана на принципах биомедицинской этики - дисциплины новой и малоизвестной

в нашей стране. Эти обстоятельства создают дополнительные трудности в совершенствовании законодательной базы здравоохранения.

Новые биотехнологии не только расширили научную сферу исследований биологов и медиков, но и породили массу этических и юридических проблем, в числе которых проблема абортов, суррогатного материнства, эвтаназии, имплантации, трансплантации, применения новых репродуктивных технологий и другие. Современные открытия в биомедицинской сфере являются предпосылкой реконструкции традиционных правовых и нравственных ценностных ориентаций и установок. Такая реконструкция коснулась не только сферы научного мировоззрения, но и этической сферы, обнажила множество проблем в сфере защиты и реализации прав человека. Противоречие между современным мировоззрением и классическим пониманием прав человека следует рассматривать как одну из важнейших проблем нормативного регулирования медицинских инноваций.

Значение биоэтики как системы нормативной регуляции обусловлено совокупностью проблем и противоречий, возникающих в связи с правовым регулированием применения современных медицинских технологий. Современное право как нормативная система ограничена в своих возможностях решать проблемы регулирования отношений, связанных с защитой права на жизнь и здоровье, на свободу и личную неприкосновенность в процессе правового регулирования абортов, трансплантации и донорства человеческих органов и тканей, вмешательства в геном человека. В случае правовых пробелов концепции и нормы биоэтики могут выступать в качестве регулятивных средств, решая задачу предупреждения конфликтов и социокультурных различий понимания сущности права человека на жизнь и здоровье в различных национальных правовых системах.

Биоэтика внесла свой вклад в формирование новой дисциплины, которая стала мостом между двумя науками естественными и гуманитарными, которые в своем диалоге сделали возможным дальнейшее развитие науки с актуальным акцентом на этику. В настоящее время в Узбекистане уделяется особое внимание созданию условий для дальнейшего повышения качества медицинских услуг во всех регионах республики. Для осуществления данной задачи актуальным является формирование биоэтической культуры будущих врачей.

Актуальность формирования социального контекста биоэтических проблем в Узбекистане

По инициативе Президента Шавката Мирзиёева в

стране последовательно продолжается работа по реформированию системы здравоохранения. Эти реформы нацелены на сохранение здоровья населения, воспитание физически и духовно здорового поколения. [4,5].

Сегодня существенные изменения в оказании медицинской помощи превращают пациентов из доверчивых, относительно пассивных получателей медицинской помощи во все более скептически настроенную и информированную группу потребителей, выражающих свои опасения и оспаривающих ранее неоспоримый авторитет практикующих врачей, чему способствовали медикализация, гипердиагностика, коммерциализация медицины. В настоящее время потребители медицинских услуг выражают озабоченность по поводу количества процедур, которым они подвергаются и сомневаются, действительно ли эти процедуры необходимы для диагностики или лечения их болезни? Население беспокоят расходы за оказание медицинских услуг и лечение по доступной цене. Система медицинского страхования только начнет работать в Городе Ташкенте. Правительство обеспечивает некоторую защиту медицинских льгот для уязвимых групп населения.

Поскольку количество и сложность этических дилемм в сфере здравоохранения, старения, психического здоровья и социальной работы продолжает расти, растет потребность в социальных работниках передового опыта, которые осведомлены о принципах и методах решения проблем, которые имеют фундаментальное значение для биоэтики и медицины. В медицинских учреждениях часто требуются этические консультации по решениям, касающимся конца жизни, донорства органов, начала или прекращения лечения. Поддержку в этих областях, а также консультировать поставщиков медицинских услуг, организации и клиентов; участие в установлении политики и обучая других этим вопросам. Потребность в биоэтике и специалистах по биоэтике сейчас шире и значительнее, чем это требуется в соответствии с действиями и политикой больниц, компаний по производству медицинского оборудования и глобальных фармацевтических корпораций. Для общества важны биоэтики, обученные этике и философии, они обладают специальным набором навыков, который крайне необходим во всех сферах государственной политики. Если принимаются законы сверху благодаря группе депутатов, оно не будет полным- пример временного положения о близкородственной трансплантации. [6].

Новый кодекс стимулирует творческое развитие биоэтики, некоторые положения биоэтики (о трансплантации

органов и тканей, вспомогательных репродуктивных технологиях и др.) закрепляются как нормы права. Правовое регулирование расширяет исследовательское поле биоэтики, привлекает внимание к рассмотрению новых актуальных проблем. Право и биоэтика, как показывает международная практика, должны в своей взаимосвязи и взаимодействии способствовать практическому осуществлению норм проекта нового кодекса. В случае правовых пробелов концепции и нормы биоэтики могут выступать в качестве регулятивных средств, решая задачу предупреждения конфликтов, понимания сущности прав человека на жизнь и здоровье в правовой системе [7].

Международный опыт показывает, что для обеспечения гарантий социальной защиты и безопасности здоровья населения при оказании медицинской и фармацевтической помощи необходима специальные механизмы, обеспечивающие эту защиту посредством биоэтических комитетов. В 1993 году создан Международный комитет по биоэтике (МКБ) ЮНЕСКО, в который входят 36 независимых экспертов. Они следят за тем, чтобы при проведении научных исследований оставался незыблемым принцип уважения достоинства каждого человека и его прав. МКБ является глобальным дискуссионным форумом, на котором обсуждаются биоэтические аспекты развития человечества. Существуют Руководство ЮНЭСКО [8], Конвенция о правах человека и биомедицине (Овьедо, 1994), большое количество международных документов, положения которых исходят из факта существования этических комитетов[9]. Этические комитеты организованы и работают в Америке, странах Европы, республиках СНГ. Так например, в кодексе Республики Казахстан «О здоровье народа и системе здравоохранения» (с изменениями и дополнениями по состоянию на 12.01.2023 г.), в статье 227. «Биомедицинские исследования», а также в статье 228. «Комиссии по биоэтике» представлены задачи, цели, условия работы этических комиссий. В статья 1. даются основные понятия, используемые в Кодексе: «биомедицинское исследование, биотехнологический лекарственный препарат, биоэтика» и другие важные понятия для современной эпохи применения биомедицинских технологий в медицинской практике.

Одним из факторов функционирования биоэтических комитетов обусловлено необходимостью регистрации лекарственных средств, реализуемых на территории РУз и их предрегистрационных испытаний.[10] . По опыту международного законодательства это должно происходить после получения положительного заключения биоэтического комитета, а затем при непосредственном

наблюдении биоэтических комитетов учреждений, на базе которых будет проводиться клиническое изучение лекарственных средств. Формирование системы этической экспертизы в нашей стране, необходимость организации сети этических комитетов(локальных комитетов, комиссий) и создание условий для их полноценного функционирования требуют отдельного предметного рассмотрения. В международной практике отдельные вопросы правовой регламентации исследовательской деятельности, где объектом изучения является человек, разработаны и представлены в руководстве ICH, GCP, Хельсинской декларации, Нюрнбергском кодексе, Международном кодексе медицинской этики, этическом кодексе врача-исследователя РУ, Законе РУ “Об обращении лекарственных средств” и в ряде подзаконных актов. Знание корреспондирующих прав и обязанностей врача и пациента является функциональной обязанностью всех врачей. Однако, имеются случаи нарушения этой обязанности, вследствие чего обе стороны – врач и пациент – находятся в одинаково невыгодной ситуации. В связи с этим вовлечение медицинских работников в просветительскую деятельность по информированию пациентов о правах, а также о правах врача является одной из неотложных задач, стоящих перед медицинским сообществом и системой здравоохранения Узбекистана.

Сегодня законодательство в сфере здравоохранения развивается и усложняется. Сегодня все более востребованными и ожидающими скорейшего ответа стали вопросы: какие правовые и этические нормы должны защитить человека в современных биомедицинских исследованиях врача и пациента? Каким должен быть механизм защиты? Как использовать опыт зарубежных стран в этой области? Без решения этико-правового регулирования проблем биомедицинских технологий невозможен прогресс медицины. К числу важнейших международных документов относятся Европейская Конвенция по биоэтике, Декларация о биоэтике и правах человека. Выявляются все новые вопросы в развитии систем здравоохранения, которые настоятельно требуют этико- морального руководства.

ВОЗ призвала Всемирный банк учитывать необходимость включения биоэтических аспектов в развитие, проектирование и оценку проектов, касающихся здравоохранения, окружающей среды и образования. Понятие «биоэтика» расширяется и перерастает границы традиционной медицинской этики. Это означает повышение социальной ответственности ученого и врача не только за соблюдение этических норм в ходе научных исследований, но и за использование

результатов науки, этические требования становятся обязательными во всех других отраслях науки и вообще в любой человеческой деятельности, которая может принести вред жизни на земле.

В проекте нового Кодекса нет статьи, которая регламентирует существование этических комитетов в лечебных учреждениях. В статье 16, по существу перечислены определенные функции этического комитета «**Контроль качества медицинских услуг»,** говорится о том, что необходим

«**…**контроль за неукоснительным соблюдением этических требований медицинским персоналом при исполнении им своих обязанностей; Проведение исследований по жалобам граждан на качество медицинских услуг; систематический анализ качества медицинских услуг, оказываемых населению в медицинских организациях (учреждениях), и соблюдения требований клинических протоколов и стандартов диагностики и лечения заболеваний; Этот контроль и другие проблемы и принципы биоэтики, которые указаны в новом кодексе (вспомогательные репродуктивные технологии, паллиативная помощь, трансплантация органов и тканей и многое другое), являются, как это принято в международной практике, делом этических комитетов, локальных этических комиссий медицинских организаций (учреждений). Необходимо создавать независимые этические комитеты для досудебного разрешения возникающих конфликтов, комплементарного соблюдения прав пациентов и прав медицинских работников**.** В новом кодексе отсутствует само понятие «этический комитет». Этические комитеты создавались с целью защиты прав пациентов, эту функцию они и продолжают успешно выполнять в международной практике. Пациенты пока мало знают об этических комитетах и о том, как они могут защищать их права. Но международный опыт показывает результативность обращений, что комитеты предлагают надежный способ досудебного разрешения конфликтов пациента и медицинской организации, пациента и врача. Кто входит в этический комитет? Независимые специалисты – психологи, юристы, журналисты, а также духовенство. Члены комитета лучше и доступнее могут объяснить пациенту его проблему, чем лечащий врач или администратор. Заключение этического комитета может быть представлено и в суде, если не удается решить проблему в досудебном порядке.

Этические комитеты нужны и врачам:

Они помогают снизить конфликтогенность в медицинском коллективе;

- помогают разрешать конфликты с пациентами;
- осуществляют информационную деятельность в

плане этико-правового самообразования врачей и

медперсонала

• оказывают помощь в подготовке и представлении юридических документов.

ЗАКЛЮЧЕНИЕ

В парадигму социального контекста развития биоэтики помимо образовательной составляющей в медицинских школах формирующих мировоззрение и в целом биоэтическую культуру будущих врачей, входит составляющая практического осуществления этой важной задачи в обществе. Она состоит в пропаганде и обсуждении биоэтического дискурса обществом усилиями ОЗ, институтами гражданского общества в целях оказания лучшей, справедливой и качественной медицинской помощи, решения биоэтических проблем, принятия законов и соответствующего правового регулирования .

Организация и постоянное просвещение населения в интересах здорового образа жизни могут быть достигнуты путем продвижения принципов биоэтики и императивов биоэтики.

Законы и принципы прав человека, концепции и технические подходы справедливости в отношении здоровья могут быть мощными инструментами для взаимного укрепления, не только путем содействия повышению осведомленности и консенсуса в отношении общих ценностей, но также путем проведения анализа и усиления измерения прав человека и справедливости в отношении здоровья в чем велика роль биоэтики и общественного здравоохранения, руководящими принципами которых являются справедливость, социальная защита, социальная ответственность и солидарность. Правовые аспекты нового кодекса должны рассматриваться в тесной связи с их биоэтической основой, что является новым и перспективным подходом в решении вопросов нормативного обеспечения реформирования здравоохранения.

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ADDRESSING CHALLENGES TO EFFECTIVE LEARNING OF CHEMISTRY SUBJECT IN REMOTE REGIONS OF AFGHNISTAN

Mohammad Yaqoob Sarfaraz[1]
Nazir Jan Sadiqi
Lecturer of Chemistry Department, Education Faculty, Kandahar University, Afghanistan

Daro Khan Ulfat
Lecturer of Chemistry Department Education Faculty, Urozgan University, Afghanistan

ABSTRACT

Chemistry ought to be taught in high schools and universities because it is one of the basic foundations of the nation's economic prosperity. This study looks for practical barriers to chemistry instruction in high schools in remote regions of Afghanistan. This project involved 586 participants from 11 different high schools. Principals, teachers, lab employees, and students of these high schools have conducted interviews. The study of the data from their interviews makes it clear that significant barriers to learning chemistry have been brought by issues relating to teachers, students, and the environment. To resolve this challenging issue as soon as possible, chemistry teachers, students, school administrators, curriculum developers, non-governmental organizations (NGOs), and the government must work together.

Keywords: Chemistry, Learning; Laboratory, Performance, Variable, Science, Teachers, Students.

Introduction

Education, especially science and technical education, serves as a "factory" for producing the technologists, technicians, craftsmen, and skilled artisans needed to revive the economy of a country and bring about the desired technological advancement, which is crucial for raising the Afghan nation from a "consumer nation" to a "producer nation" and from a "developing nation" to a "developed nation" [1].

Since chemistry is an applied science and comprises the fundamentals of many concepts and occurrences, it is essential to the growth of science and technology. Additionally, it aids people in comprehending a

[1] Corresponding Author: myaqoobsarfaraz@gmail.com (Mohammad Yaqoob Sarfaraz)

culture that is undergoing a technological revolution. Chemistry is a subject that is important in many different fields, including medical and healthcare, environmental science, energy production, materials science, food science, agriculture, engineering cosmetics and personal care products, industrial operations, and education and research. Chemistry is taught at the high school level in Afghanistan for three periods per week to accomplish the following goals: To promote basic literacy in chemistry for socially functional living; to acquire basic chemistry concepts and principles as a presentation for further study; to acquire basic scientific skills and an attitude as a preparation for the industrial and technological applications of chemistry; and to foster and enhance creativity [4]. In summary, chemistry education in Afghanistan offers students the ability to acquire crucial skills and knowledge that can advance their personal growth and that of the country.

An adequate level of scientific and technological skills must be attaining to meet the challenge posed by the constantly changing requirements of the modern workplace in industries and the non-formal sector. Therefore, systems of education and training that successfully address these demands will enhance efforts to combat rising unemployment and the marginalization of the majority of people. By providing the right learning opportunities, we can significantly improve the lives of the unemployed, increase productivity, and lower poverty and unemployment among our young people.

Because of these, science education has been given a top priority on a global scale. Chemistry has been recognized as a very important science subject in the framework of science education, and its significance in the scientific and technical advancement of any country has been widely reported [2]. Chemistry was deemed a required subject among the natural sciences and other science-related courses in the Afghan educational system as a result of the recognition given to it in the development of the individual and the nation [2].

Chemistry instruction should be goal-oriented and student-centered, and this can only be done when the students are willing, the teachers are in good spirits, and the students are being taught utilizing materials and methods [2]. Since students are naturally curious, they must actively participate in the learning process, constantly preparing, testing, speculating, and constructing their particular construct and knowledge, such knowledge can be made valid, significant, and beneficial to people by personalizing it. Students must actively create their awareness and purpose in chemistry [3]. Based on [4], the brain is not a passive consumer of information order to learn with comprehension, the learner must

actively make meaning of what is to be learned in order to support the claim.

Students still do poorly in chemistry and other disciplines, despite the prominence of chemistry in our educational system and researchers' best attempts to raise achievement levels. The lack of resources, limited access to high-quality education, language obstacles, inadequate labs, teachers' attitudes, lack of interest or motivation, lack of syllabus covering, class size, unprofessionalism, teaching methods, and environment are some causes for this failure.

Practical science school allow students to study in a meaningful way, cultivate the abilities and attitudes required to live successfully, and contribute to the growth of society.

Statement of the Problem

The mentioned problems are views as obstacles to efficiently teaching chemistry in high schools. If these difficulties resolved, students will be enthusiastic about the topic of chemistry and will do well in it.

The goal of this study is to examine the obstacles that prevent the effective teaching of chemistry in a 11 chosen schools in Kandahar, Ghazni and Paktika provinces. These obstacles include teacher variables (attitude, training, attendance at chemistry workshops, condition of service), student variables (career choice and attitude), and environmental variables (class size, school location, and lab facilities). The factors mentioned earlier, believed to be some of the causes of the continued decline in student performance in chemistry, should be considered.

Methodology

This work was conducted via a questionnaire. Questionnaires were distributed to 11 administrators, 8 chemistry lab technicians, and 14 chemistry teachers from 11 selected schools in different remote regions of Kandahar, Ghazni and Paktika provinces in Afghanistan. 553 students of same 11 schools also took part in interviews who were chosen randomly. Teachers were asked a series of questions about their qualifications, attitudes, retraining, student discipline preferences, attitudes, and environmental variables, and their responses were recorded and analyzed.

Findings

Attitudes: The attitude of teachers has a significant impact on the success of chemistry instruction through inspiring students, maintaining a good learning atmosphere, offering assistance, adapting to individual needs, never stopping learning, motivating students, and serving as role models.

It was found that the majority of teachers perceive their careers as educators to be temporary stepping stones to greater employment. Some students had the following to say about their attitudes toward chemistry: "I sometimes fail chemistry because it's hard to understand so I don't have much time for it"; "I don't like it too much; I prefer Biology to it".

Non-professionalism: Although it may not be the only factor, non-professionalism among Afghan teachers may be a factor in the country's low success levels. Educational performance of any nation can be influenced by a number of variables, including socioeconomic problems, a lack of funding, shoddy infrastructure, and unstable political conditions. While it is true that a teacher's lack of professionalism can have a negative effect on students' academic performance, it is vital to take the larger Afghani society into account.

According to this study, some teachers who instruct chemistry are not chemistry majors. Another teacher replied, "I read agriculture but was asked to teach chemistry because there were no other teachers," and "I graduated from physics but teach chemistry." There is little doubt that a teacher's lack of professionalism can harm students' academic performance.

Time Constraint:

Time constraints are a serious issue that can keep a syllabus from being finished. Many educational institutions allot a defined amount of time for each subject or course, and if the syllabus is excessively lengthy or difficult, it might not be possible to cover all the material within the allotted time.

When there are additional conflicting goals or subjects that need to be taught, this can be more difficult. To make sure that crucial concepts are taught, teachers and instructors frequently have to make difficult judgments regarding what subject to prioritize and what topics to discard or skim over.

In certain high schools with sizable student populations, courses are organized into sets (class A, B, C, etc.) and have two encounters lasting 35–40 minutes each. Some teachers responded, "It is not possible to cover unless you do some extra work outside of your normal schedule, but I am not ready to do that now," when asked if they could finish their syllabus before the students took their final exams.

The amount of instructional time can also be reduced by unforeseen interruptions like holidays, school closings, or unforeseen incidents. Due to these interruptions, there may be even less time for instruction and learning, which will make it harder to finish the curriculum.

In these situations, teachers may need to modify their pedagogical approaches and come up with novel ways to make the most of

their allotted time. This could entail putting important ideas first, employing effective teaching techniques, offering more materials for independent study, or changing assessment procedures to concentrate on crucial information and abilities.

Overall, when developing their curricula and lesson plans, educators must take time constraints into account. To guarantee that children receive a well-rounded education despite the limitations imposed by time constraints, rigorous planning and adaptability are required.

Chemistry Workshop: A chemistry workshop for chemistry teachers is crucial since it helps them advance their understanding and proficiency in the field. These are some of the main justifications why such workshops are crucial:

1. Knowledge update: The discipline of chemistry is rapidly developing, with new breakthroughs and discoveries being discovered on a regular basis. Workshops give teachers the chance to learn about the most recent advancements in the field, ensuring that they have current information to impart to their students.

2. Developing practical abilities: Chemistry workshops frequently include interactive activities and experiments that help teachers hone their practical skills. As a result, they can carry out experiments and effectively show topics in their own classrooms, which makes studying more interesting for the students.

3. Opportunities for networking: Workshops bring together chemistry professors from various institutions and areas, offering a setting for interaction and cooperation. Teachers can share best practices, learn from one another's experiences, and exchange ideas to ultimately improve their teaching techniques.

4. Pedagogical strategies: Chemistry seminars frequently concentrate on cutting-edge teaching techniques and approaches that can be utilized to help students better understand difficult ideas. Teachers can discover fresh methods for engrossing students, encouraging critical thought, and fostering a deeper comprehension of chemistry concepts.

5. Professional advancement: Attending workshops displays a dedication to one's own professional advancement as a chemistry instructor. It demonstrates a commitment to keeping abreast of professional developments and advancing instructional techniques.

6. Resource sharing: Workshops frequently offer access to resources, like lesson plans, instructional materials, textbooks, software tools, or online learning environments, that can help teachers give excellent chemistry instruction.

7. Motivation and inspiration: Attending a chemistry workshop helps rekindle teachers' passion for their subject by introducing them to fresh viewpoints, ideas, and scientific

discoveries. It can encourage them to investigate various chemistry topics or try out cutting-edge instruction methods.

In general, chemistry workshops are extremely important for equipping chemistry teachers with the most recent information, real-world skills, networking opportunities, pedagogical strategies, and resources. Teachers can improve the quality of chemistry education and eventually encourage students to pursue professions in the subject by making an investment in their professional development.

Five teachers who were conducted interviewed had participated in chemistry-related workshops and seminars. In their opinion, these workshops were highly beneficial for chemistry instructors and should continue in the future. However, three teachers had attended a few workshops, while the others had not. These teachers claim that competent teachers are not introduced to workshops at high schools, but rather that workshops are frequently offered to teachers based on friendship and acquaintance.

Class Size: Depending on a number of variables, the impact of student class size on chemistry learning can vary. Here are a few possible outcomes:

1. Individual Attention: Teachers may provide each student more one-on-one time in smaller classes. This enables individualized training, the resolution of questions, and focused feedback, all of which can improve learning results.

2. Active Participation: Smaller class sizes frequently encourage more student involvement and participation. A stronger knowledge of chemical subjects may result from students feeling more at ease while asking questions, sharing opinions, and taking part in discussions.

3. Opportunities for Collaboration: When there are fewer people in a class, there may be more chances for collaborative learning activities like group projects or peer interactions. This can improve teamwork abilities and present several angles on problem-solving.

4. Smaller class sizes enable teachers to develop stronger connections with their students. This can foster a positive learning atmosphere where students feel appreciated and inspired to succeed in chemistry.

5. Classroom management: It can be difficult for teachers to control larger classes, which results in less time being spent on providing specialized education or attending to particular student needs. Smaller class sizes may provide teachers more control over the dynamics of the classroom, allowing them to adjust their teaching methods as necessary.

6. Resource Distribution: Smaller class sizes might make it possible to distribute resources like lab supplies or experiment-

related supplies more effectively. Students may have access to more relevant resources and more hands-on experiences, which will help them better comprehend the applications of chemistry.

In this study, teachers were questioned about how much the size of their class affected their ability to teach. Their remarks were as follows: "I teach three classes with an average of 50 students each, which has a negative impact on my efficiency because, first, class management is a challenge, and second, I can't be certain whether each student is understanding or participating in the learning process." A different teacher retorted, "I have a total of 60 students in each of the classes I teach, so I spend a lot of time controlling the class and the actual time for teaching is very small, and this affects the students' performances in their final exams."

Conditions of service/ Remunerations: Most teachers' morale has been ruined by poor pay and employee welfare. Poor working and wage conditions for teachers are a severe issue in many countries, particularly Afghanistan. Here are some problems that teachers run through regularly:

1. Low salary: Compared to other occupations with comparable educational requirements, teachers frequently make less money. Financial hardships and instructor unhappiness may result from this.

2. Lack of benefits: Many instructors do not receive enough perks like paid time off or health insurance. Their general well-being may be negatively impacted by this lack of assistance.

3. Overwhelming workload: Teachers frequently face overwhelming workloads, which include extended working hours, in-depth lesson planning, evaluating assignments, and extracurricular activities. Despite the difficulty of their work, individuals might not get paid fairly for the extra time and effort they put in.

4. There may occasionally be few chances for teachers to expand their careers or pursue professional development. This lack of opportunities for progress may result in demotivation and a drop in job satisfaction.

5. Inadequate resources: Many schools lack the necessary supplies, including books, teaching aids, computers, and classroom equipment. This makes it difficult for teachers to provide high-quality instruction and has an influence on their capacity to engage students successfully.

6. Lack of support staff: Teachers frequently have to do administrative duties like clerical work or addressing student behavior issues that may be assigned to support staff. Teachers' workloads are increased and their ability to concentrate on teaching is hampered by a lack of sufficient support personnel.

A multifaceted strategy including government regulations, educational authorities, school boards, and teacher unions is necessary to address these problems. Prioritizing teachers' well-being and professional development requires fair compensation packages, improved working conditions, opportunities for career advancement and professional development, access to necessary resources, and appreciation of their contributions to society.

Inadequate infrastructure: Inadequate infrastructure, such as schools and educational institutions, is lacking in many rural parts of Afghanistan. Due of this, it is difficult to hire and keep talented teachers because they often choose to work in locations with superior amenities and resources.

Laboratory Adequacy: Chemistry is a subject that necessitates a lot of demonstrations and is best taught in a laboratory for easy access to instructional materials; yet, the majority of schools lack the necessary equipment. Lab adequacy in chemistry education refers to the availability and caliber of laboratory materials, apparatus, and facilities that facilitate practical learning experiences and hands-on experimentation. Adequate labs can have a big impact on students' understanding, engagement, and overall learning results in chemistry classes. A few of the results are:

1. Enhanced understanding: Laboratory exercises provide students the chance to put the theoretical ideas they've learned in class to use in practical settings. Students can witness chemical reactions, control factors, gather data, and assess outcomes through hands-on experimentation. This active participation encourages a deeper comprehension of ideas and principles.

2. Improved retention: When compared to passive learning techniques, laboratory activities in the classroom help students remember material better. Conducting experiments involves visual observation, tactile experience, and critical thinking, which improves memory retention.

3. Development of scientific skills: Students can learn crucial scientific skills including observation, measurement, data analysis, problem-solving, critical thinking, and teamwork by having adequate labs. These abilities are essential for success in chemistry as well as other scientific fields.

4. Increased motivation and interest: Students' curiosity and interest can be stimulated in well-stocked laboratories with cutting-edge equipment and resources. Participating in practical activities piques their interest in chemical phenomena and motivates them to learn more. This heightened curiosity may inspire greater motivation to learn chemistry.

5. Preparation for future careers: A well-equipped lab environment gives students the hands-on training they need to be ready for professions in chemistry-related fields or scientific research. They have a competitive advantage while pursuing higher education or entering the workforce since they are familiar with laboratory procedures and tools.

6. Safety awareness: Adequate labs have safety features like sufficient ventilation systems, protective gear like goggles, emergency procedures, and trained staff. When working with chemicals or carrying out experiments on their own, students who learn chemistry in well-equipped labs develop a strong sense of safety awareness.

7. Enhanced problem-solving abilities: It's common practice in laboratories to troubleshoot and overcome obstacles. Students gain knowledge on how to spot mistakes, fix them, make changes, and resolve issues that arise during experiments. These problem-solving abilities can be used to many facets of life.

In conclusion, adequate labs in chemistry classes benefit students' comprehension, retention, development of scientific skills, enthusiasm, and motivation as well as their readiness for careers, knowledge of safety issues, and problem-solving skills. It fosters a thorough and useful comprehension of the subject, which is vital.

One of the students said “I started offering chemistry because I wanted to study science, but there is no lab and no teacher here. Regarding the same subject, another student stated, "I am about to graduate from 12th grade and we have just been introduced to the lab, but I cannot stand the experiment because the place is not favorable. We simply heard about a chemistry lab. Some students at the same school claimed there was no lab because "it's still being built and we've never done any practical since we started teaching sciences."

Some teachers stated, "We have a temporary laboratory and it's not well equipped, the place is not conducive and this makes the student not to concentrate during practical lessons."

Discussion

From the results, it is clear that teaching has become little more than a transportation job. They lack passion for teaching because they are waiting for better careers. The manner they teach their courses reflects this mentality, which has a negative impact on the performance of the students. The study clearly shows that students' poor attitudes toward chemistry were

frequently the cause of the poor performance we see now, which is in line with the claims made by Ojo [5] and Adesokan [6].

The study also demonstrated that one of the primary challenge for chemistry teaching is time restrictions. It is the cause of the lack of science practical and the neglect of the curricula. Students are also discouraged by the level of concentration necessary since they are unwilling to give up time that could be spent doing other things. Because the teacher is unable to complete any worthwhile practical within the time permitted, the time allotted for each session and the number of times devoted to chemistry each week are often insufficient for successful learning. Chemistry student performance is alleged to suffer as a result of the environment, or laboratory suitability [7].

According to this survey, some students believed that if they had been introduced to practical learning earlier, they would have performed better. This is consistent with Farounbi's [8] claim that using laboratories in the scientific classroom helps students comprehend and retain what they see more so than what they hear, but that most schools lack functional laboratories.

Regarding the impact of examination dishonesty, some respondents claimed that it has negatively impacted students' performance in the sciences in general as well as in chemistry. It is clear that students who did not learn cannot perform, and since exams are still a common way to gauge performance, particularly in our society. As a result, teachers who did not do their work well—possibly due to a lack of time—but wanted to please the school and the parents engaged in exam malpractice, resulting in students who appeared colorful but lacked solid subject knowledge. The students are aware that even if they are not serious and diligent in their studies, their parents or teachers will nonetheless require them to pass the final exam. These results support those of Almulla [9].

The majority of respondents also cited class size as a significant barrier to effective teaching and learning. In order for the majority of the issues in chemistry to be fully comprehended, it is necessary to engage the students. However, this is extremely challenging in large classes. This is in line with what Onocha [10] discovered, which is that big class sizes discourage serious academic effort.

Particularly in chemistry, non-professionalism is the norm. Most graduates either declare they are teachers or are required to teach any topic. There have been instances where engineers have claimed they can teach physics, math, and chemistry more effectively than people who have had formal training in the subject and are often required to do so.

One of the variables that causes most instructors to divert from their core task and engage in other pursuits that will raise their standard of living has also been recognized as poor remuneration. People who are incapable of working in the commercial world are discouraged; they keep complaining and looking for better jobs. Private school students believe they are being taken advantage of. Such a mindset makes it impossible for anyone to work effectively, which ostensibly leads to the kids performing poorly.

Conclusion

This study has shown that the school environment and teacher-related elements, such as attitude, time, compensation, and laboratory suitability, pose significant obstacles to effective chemistry instruction and have a significant impact on students' success in the subject. These elements both directly and indirectly highlight problems that must be solved in order to improve students' chemistry learning results. Student achievement will undoubtedly increase if the government and other education sector stakeholders can enhance the learning environment for students and inspire the teachers who carry out the curriculum.

In conclusion, there are a number of challenges that prevent effective education delivery when teaching chemistry in high schools in remote regions of Afghanistan.

Recommendations

Several possible recommendations can be put into practice in order to properly handle these challenges.

1. Increased funding is required for infrastructure development, including the construction of modern laboratories and the allocation of necessary materials. This would make it possible for students to conduct real-world experiments and improve their comprehension of chemistry ideas.

2. In rural places, efforts should be made to recruit and keep qualified chemistry teachers. Incentives including increased pay, chances for professional growth, and better living conditions can assist educators decide to work in these areas despite their reluctance.

In addition, community involvement initiatives should be started to spread the word about the value of chemistry education for both boys and girls. More students can be inspired to study science by removing cultural obstacles and encouraging diversity.

3. Ensuring a safe learning environment through enhanced security measures is crucial. Collaborative efforts between local

communities, educational institutions, and government authorities can help mitigate security concerns and provide a conducive atmosphere for teaching and learning.

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KIBERSTALKING: TURLARI, KO‘RINISHLARI VA IJTIMOIY OQIBATLARI

Sardor Komil o‘g‘li Alimov
“Oila va xotin-qizlar” ilmiy-tadqiqot instituti bo‘lim boshlig‘i,
falsafa fanlari bo‘yicha falsafa doktori (PhD)
sardoralimov2507@mail.ru

Nargiza Rustam qizi Alimova
O‘zbekiston Milliy universiteti tayanch doktoranti
nargisalimova0104@mail.ru

ANNOTATSIYA

Ushbu maqolada kiberzo‘ravonlikning bir shakli bo‘lgan kiberstalkingning mazmun-mohiyati, uning ko‘rinishlari, o‘ziga xos jihatlari, sabablari va ijtimoiy oqibatlari xorijiy tajriba asosida o‘rganilgan.

Kalit so‘zlar: kiberzo‘ravonlik, kiberstalking, Internet, virtual makon, kiberbulling, doksing, IP manzil, Korporativ kiberstalking.

ABSTRACT

This article examines the essence of cyberstalking, which is a form of cyber-violence, its types, specific aspects, causes and social consequences based on foreign experience.

Keywords: cyber-violence, cyberstalking, Internet, virtual space, cyberbullying, doxing, IP address, corporative cyberstalking.

KIRISH

Bugungi kunda globallashuv tufayli butun dunyo bo‘yicha dolzarb ahamiyat kasb etib borayotgan, bir vaqtning o‘zida virtual makon hamda real makonga daxldor bo‘lgan ijtimoiy, axloqiy, huquqiy muammolardan biri – kibezo‘ravonlik, xususan, kiberstalking (kibermakonda ta’qib) hisoblanadi. Real hayotdagi elementlarning virtual hayotga o‘tish imkoniyati hamisha ijobiy oqibatlarga olib kelmaganidek, kibermakondagi insonlarga nisbatan kibertahdidlarning mavjudligi bugungi kunda asosiy ijtimoiy muammolardan biriga aylanib, falsafiy jihatdan mazkur muammoni tahlil etish dolzarb ahamiyat kasb etib bormoqda.

Kiberstalking – kiberzo‘ravonlikning bir turi bo‘lib, alohida shaxsni, shaxslar guruhini yoki tashkilotni **bezovta qilish, ta’qib etish** maqsadida **Internet** yoki boshqa **raqamli vositalardan foydalanish** hisoblanadi [1]. Kiberstalking umumiy stalking (inglizcha – bu biror shaxs yoki guruh tomonidan boshqa shaxsga nisbatan istalmagan va/yoki takroriy kuzatish, ta’qib) huquqbuzarligining shakli bo‘lib, kibermakonda sodir etilishi,

Internet, ijtimoiy tarmoqlar yoki boshqa elektron, raqamli vositalar orqali sodir bo‘lishi bilan xarakterlanadi. Kiberstalking tor ma’noda kiber ta’qibni anglatsa, keng ma’noda uning tarkibiga yolg‘on ayblovlar yoki ma’lumotlar tarqatish, tuhmat, shaxsiy ma’lumotlarni o‘g‘rilash yoki shunga urinish, tahdidlar, vandalizm, jinsiy aloqaga chorlash, qo‘rqitish yoki bezovta qilishi mumkin bo‘lgan ma’lumotlarni to‘plash kabi xatti-harakatlarni kiritish mumkin[2].

Kiberstalkingni sodir etuvchi shaxs kiberstalker deb atalib, u jabrlanuvchiga tanish yoki notanish bo‘lishi, xatti-harakatlarini anonim tarzda sodir etishi mumkin. Umuman olganda, anonimlik kiberstalkingning o‘ziga xos xususuyati hisoblanadi.

Kiberstalking atamasiga to‘liq va aniq ta’rif berilmaganligi tufayli mazkur tushuncha ko‘pincha kiberbulling, doksing, kiberxarrasment kabi kiberzo‘ravonlikning boshqa turlari bilan aynan yoki o‘xshash tarzda ta’riflanadi. Shundan kelib chiqib aytishimiz mumkinki, kiberstalking kiberbulling va jismoniy stalkingning aralashmasi bo‘lib, ushbu onlayn ta’qib qilish elektron pochta, matnli xabarlar, ijtimoiy tarmoqdagi xabarlar va boshqa shaklda bo‘lishi mumkin va ko‘pincha muntazam yoki takroriy, oldindan rejalashtirilgan va qat’iy xarakterda bo‘ladi [3].

ADABIYOTLAR TAHLILI VA METODOLOGIYA

Virtual makonga taalluqli tadqiqotlar o‘zbek falsafasi, jumladan, huquq falsafasi, axloq falsafasi va borliq falsafasida bugungi kunda eng ko‘p murojaat etilayotgan, tadqiq etilayotgan ilmiy muammolardan hisoblanadi. . Jumladan, “Oila va xotin-qizlar” instituti tomonidan mazkur yo‘nalishda qator ilmiy-tadqiqot ishlari amalga oshirilib kelmoqda. Umuman olganda, bugungi kunda mahalliy mualliflar tomonidan kibermakon, kiberzo‘ravonlik mavzulari psixologik, pedogogik, falsafiy, huquqiy nuqtai nazardan tadqiq etib kelinmoqda [4;5;6;7;8;9].

Kiberstalkingni boshqa turdagi kiberzo‘ravonliklardan farqlashda ma’lum bir jihatlarga e’tibor qaratish lozim. Kibertrolling bilan kiberstalkingning asosiy farqi, kibertrolling turli ijtimoiy tarmoqlar yoki raqamli platformalarda foydalanuvchilar o‘rtasida nizo kelib chiqishi yoki kommunikativ ziddiyatlarning kuchayishiga urinish bo‘lib, u bir martalik, oldindan rejalashtirilmagan, qurbon yoki qurbonlarning xatti-harakat sub’ekti tomonidan oldindan tanlab olinmaganligi bilan xarakterlanadi. Kiberstalkingda esa qurbon oldindan tanlab olinadi, xatti-harakat rejalashtiriladi, doimiy yoki takroriy tarzda sodir etiladi. Umuman olganda, kiberstalking kiberbulling, kibertrolling, kiberauting va boshqa kiber ta’qib va zo‘ravonliklardan kibermakondagi psixologik ta’sirning eng

tajovuzkor ko‘rinishi ekanligi, qurbonni bevosita ta’qib qilish va kuzatishga yo‘nalganligi bilan ajralib turadi[10].

Shuningdek, ba’zi tadqiqotchilar kiberstalkingni jabrlanuvchi bilan ayni vaqtda aloqasi bo‘lmagan shaxs tomonidan sodir etilishiga e’tibor qaratsa [11], boshqa tadqiqotchilar kiberstalkingning moliyaviy sabablarga ko‘ra ma’lumotlarni o‘g‘irlashdan ajratib [12], uning motivlari psixologik, shaxsda qo‘rquv va xavotir uyg‘otishga yo‘naltirilganlini e’tirof etishadi. Kiberstalking bu nafrat, qasos yoki manipulyatsiya qilish istagi tufayli nishonga olingan shaxsga “raqamli hujum” qilish hisoblanadi.

Kiberstalking va kiberbulling tushunchalari o‘rtasida ko‘plab mamlakatlar, xususan AQSH qonunchiligida farq deyarli mavjud emas. Asosiy farq yoshga bog‘liq bo‘lib, kattalarga nisbatan sodir etilsa, kiberstalking, bolalarga nisbatan sodir etilsa esa kiberbulling sifatida tasniflanadi [13].

NATIJALAR VA MUHOKAMA

Kiberstalking klassifikatsiyasi

Quyidagi xatti-harakatlarni kiberstalking sifatida tasniflash mumkin:

- **Soxta ayblovlar va ma’lumotlar.** Ko‘pgina kiberstalkerlar o‘z qurbonlarining obro‘siga putur yetkazishga va boshqa odamlarni ularga qarshi qo‘yishga harakat qiladilar. Ular turli veb-saytlarda qurbonlari haqida noto‘g‘ri ma’lumotlarni tarqatadilar. Ba’zida bu uchun maxsus saytlar, bloglar, akkauntlar yaratishlari mumkin. Ular qurbon haqidagi soxta ma’lumotlarni turli guruhlar, chatlar yoki wikipedia, amazon.com kabi ommaviy maqola shakllantirish imkoniyati mavjud bo‘lgan saytlarga joylashtirishadi.

- **Jabrlanuvchi haqidagi ma’lumotlarni to‘plashga urinish.** Kiberstalkerlar shaxsiy ma’lumotlarni olish uchun jabrlanuvchining do‘stlari, oilasi va hamkasblariga murojaat qilishlari mumkin. Ular Internetda ma’lumot olish uchun reklama qilishlari yoki xususiy detektiv yollashlari ham mumkin.

- Jabrlanuvchining onlayn faoliyatini kuzatish va ko‘proq ma’lumot to‘plash maqsadida **ularning IP manzilini kuzatishga harakat qilish.**

- **Boshqalarni jabrlanuvchini ta’qib qilishga undash.** Ko‘pgina kiberstalkerlar ta’qibga uchinchi shaxslarni jalb qilishga harakat qilishadi. Ular jabrlanuvchi ta’qibchiga yoki uning oilasiga qandaydir zarar yetkazganini da’vo qilishi yoki boshqalarni ta’qibga qo‘shilishga undash uchun jabrlanuvchining ismi va telefon raqami yoki boshqa ma’lumotlarini ochiq resurslarga (saytlar, guruhlar, bloglar, chatlar) joylashtirishi mumkin.

- **Yolg‘on viktimizatsiya.** Kiberstalker u jabrlanuvchini emas, balki jabrlanuvchi uni ta’qib qilayotganligini da’vo qilishi mumkin.

- **Ma’lumotlar yoki gadjetlarga hujum.** Kiberstalkerlar jabrlanuvchining kompyuteri yoki boshqa gadjetlariga turli viruslar yuborish orqali zarar yetkazishga urinishi mumkin.

- **Tovarlar va xizmatlarga buyurtma berish.** Kiberstalkerlar jabrlanuvchi nomidan u istamagan, obro‘siga putur yetkazishi mumkin bo‘lgan narsalar yoki xizmatlarga buyurtma berishadi yoki turli pronografik mazmundagi jurnallarga obuna bo‘lishadi. Pornografik jurnallar va o‘yinchoqlarni jabrlanuvchining ish joyiga yetkazishga urinishlari ham mumkin.

- **Uchrashuvni tashkillashtirish.** Yoshlar va ayollar ko‘pincha kiberstalkerlar tomonidan uchrashuvga taklif qilinish xavfida bo‘lishadi.

- **Turli saytlar va raqamli platformalarga jabrlanuvchi haqidagi tuhmat yoki kamsituvchi bayonotlarni joylashtirish** va shu orqali jabrlanuvchiga psixologik ta’sir qilishga urinish ham kiberstalking hisoblanadi.

Kiberstalking turlari:

1. **Notanish odamlar tomonidan sodir etilgan kiberstalking.** Kiberstalkerlar jabrlanuvchilarga mutlaqo tanish bo‘lmasligi mumkin. Ular tasodifiy qurbonni veb-sahifalar yoki ijtimoiy tarmoqlardan topishi mumkin.

2. **Genderga asoslangan kiberstalking.** Onlayn jinsiy zo‘ravonlik bo‘lib, jabrlanuvchini gender jihatdan kamsitish, ta’qib qilish hisoblanadi. Jinsiy zo‘ravonlik tahdidi yoki turli shakldagi (matn, rasm, video, audio) shaxsiy ma’lumotlarni Internetga joylashtirish bilan amalga oshiriladi [14].

3. **Turmush o‘rtoq yoki intim sherik kiberstalkingi.** Mazkur kiberstalking hozirgi yoki sobiq turmush o‘rtoq (intim sherik)ning onlayn ta’qibi. Bu oiladagi zo‘ravonlikning bir ko‘rinishi bo‘lib, ekspertlarning fikriga ko‘ra, uning maqsadi jabrlanuvchining ijtimoiy izolyatsiyasini yaratish va uni qaram qilish uchun nazorat qilishdir [15]. Ta’qib qiluvchilar o‘z qurbonlariga qayta-qayta bezovta qiluvchi va qo‘rqituvchi elektron pochta xabarlarini yuborishi mumkin.

4. **Mashhur shaxslarga nisbatan kiberstalking.** Mashhur shaxslar, jamoat arboblari, shoubiznes vakillari odatda kiberstalkingning odatiy qurbonlari hisoblanishadi. Kiberstalkerlar odatda o‘zlari yaxshi bilgan insonlarni, jumladan mashhur insonlarni qurbon sifatida tanlab olishadi, ba’zida mashhur inson ham uni bilishiga ishonishadi. Har doim omma e’tiborida bo‘lgan mashhur shaxslar va jamoat arboblari ko‘pincha o‘zlarini muxlislari deb ko‘rsatadigan kiberstalkerlarning qurboni bo‘lishadi.

5. **Internet jinoyatchilar, anonim guruhlar tomonidan sodir etilgan kiberstalking.** Zamonaviy Web 2.0 texnologiyalari anonim odamlar guruhlariga tuhmat, zo‘ravonlik tahdidlari va raqamli hujumlar uchun qurbonlarni qidirish imkonini beradi. Bunga yolg‘on bayonotlar, soxta fotosuratlar, zo‘rlash tahdidi yoki boshqa zo‘ravonlik tahdidlari, jabrlanuvchi haqida intim ma’lumotlarni joylashtirish, ish beruvchilariga zararli elektron pochta xabarlarini yuborish kiradi. Bundan tashqari, kiberstalkerlar jabrlanuvchining obro‘siga putur yetkazadigan kontentni Internetda mashhurroq qilish uchun ko‘pincha qidiruv tizimlarini manipulyatsiya qilishadi. Bunday harakatlar ko‘pincha qurbonlarni taxallusdan foydalanishga yoki butunlay oflayn rejimga o‘tishga majbur qiladi[16].

6. **Korporativ kiberstalking** – bu guruh tomonidan jismoniy shaxsga yoki jismoniy shaxslar guruhiga nisbatan kiber-ta’qib. Korporativ kiberstalking motivlari odatda moliyaviy daromad yoki qasos olish istagini o‘z ichiga oladi [17].

Kiberstalkerlarning 4 turi

Leroy MakFerleyn va **Pol Bosich** kabi tadqiqotchilarning fikricha, kiberstalkerlarni **4 turga ajratish** mumkin:

1. **Qasoskor-kiberstalkerlar.** Ularning kiber hujumlarining shafqatsizligi bilan ajralib turadi;

2. Faqatgina vazifasi jabrlanuvchi bezovta qilish bo‘lgan **sovuqqon kiberstalkerlar;**

3. **Intim kiberstalkerlar**. Ular odatda jabrlanuvchi bilan yaqin munosabatda bo‘lishni istashadi, lekin rad etilgan taqdirda onlayn ta’qib qilishni boshlashadi;

4. Ma’lum motiv atrofida birlashgan kiberstalkerlar guruhi [18].

Kiberstalking va qonunchilik

Dunyoning ko‘plab mamlakatlarida kiberstalking huquqbuzarlik sifatida talqin etilib, uni sodir etgan shaxslarga nisbatan tegishli tartibda jazo belgilangan. Quyidagi jadvalda ba’zi mamlakatlarning qonunchiligida kiberstalkingga nisbatan turlicha yondashuvlarni ko‘rishimiz mumkin:

№	Davlat nomi	Mavjud holat
1.	Avstraliya	Kiberstalking bo‘yicha alohida qonun mavjud emas. Ammo mavjud qonunlar bilan tartibga solish imkoniyati mavjud. Masalan, 1975-yil qabul qilingan Oila huquqi qonuni (Family Law Act 1975 (Cth)) oilaviy zo‘rovonlik qurbonlarini ta’qibning har qanday turidan, xususan, elektron ta’qibdan himoya qilishi belgilangan. (Australian Law Reform Commission. "Harassment and stalking offences". www.alrc.gov.au)
2.	AQSH	AQShda kiberstalking va kiberbulling o‘rtasida deyarli farq yo‘q. Onlayn ta’qib kattalarga nisbatan sodir bo‘lsa, kiberstalking, bolalarga nisbatan sodir bo‘lsa, kiberbulling hisoblanadi. AQShda kiberstalking va kiberbulling bo‘yicha yaxlit federal qonun qabul qilinmagan. Har bir shtat o‘z yurisdiksiyasidan kelib chiqib, qonunlar qabul qiladi, jazo belgilaydi. Masalan, Missuri shtatida “Megan qonuni” qabul qilingan bo‘lib, unga ko‘ra, 21 yoshdan katta kishilar 18 yoshga to‘lmaganlarga nisbatan kiber-ta’qibni amalga oshirishlari jinoyat hisoblanadi. (https://pantagraph.com/news/article_6ade6d44-a162-54d1-9be0-88bebf181f6d.html) Kaliforniya shtatining Jinoyat kodeksida kiberstalking 1999-yildan jinoyat sifatida tasnif qilingan. Shuningdek, 2009-yil 1-yanvarda kuchga kirgan qonunga ko‘ra, maktablardagi o‘quvchilarga nisbatan kiberstalking tartibga solingan. Kaliforniya Fuqarolik kodeksining 1708.7-bo‘limida kiberstalking tufayli yetkazilgan zararni undirish uchun sudga da’vo kiritish ko‘rsatilgan. (http://euro.ecom.cmu.edu/program/law/08-732/Crime/CaliforniaPenal646-9.pdf; https://casetext.com/statute/california-codes/california-civil-code/division-3-obligations/part-3-obligations-imposed-by-law/section-17087-stalking) Florida shtati qonunchiligiga ko‘ra, kiberstalking birinchi darajali jinoyat hisoblanadi. Shtat qonunchiligiga ko‘ra, kiberstalking sodir etgan bolaning ota-onasi ham jinoyatchi hisoblanadi, holat bo‘yicha xabar bermagan maktablar esa jarimaga tortiladi. (https://en.wikipedia.org/wiki/Cyberstalking_legislation) Nyu-York shtatida boshlang‘ich va o‘rta maktab o‘quvchilarini himoya qilishga qaratilgan qonun mavjud. (https://legislation.nysenate.gov/pdf/bills/2009/a3661)
3.	Filippin	2014-yilda senator Menni Villar tomonidan kiber ta’qib qilish to‘g‘risidagi qonun loyihasi ishlab chiqildi va amaliyotga joriy etildi. (http://legacy.senate.gov.ph/lisdata/95988070!.pdf)

4.	Hindiston	2013-yilda Hindiston Jinoyat kodeksiga kiberstalkingni jinoyat sifatida belgilangan o‘zgartirishlar kiritildi. Kiberstalking uchun mamlakatda 3 yildan – 5 yilgacha ozodlikdan mahrum qilish va jarima jazolari qo‘llaniladi. (https://en.wikipedia.org/wiki/Indian_Penal_Code)
5.	Polsha	2011-yildan boshlab kiberstalking noqonuniy hisoblanadi. (https://en.wikipedia.org/wiki/Cyberstalking_legislation)

XULOSA

Bugungi kunda kiberzo‘ravonlik va kiberstalkingga oid ma’lumotlarni, mavzuga xalqaro maydonda shakllangan munosabatni tahlil etib, quyidagi taklif va tavsiyalarni xulosa o‘rnida taqdim etish mumkin:

1. Aholining, xususan **bolalar va xotin-qizlarning** kiberzo‘ravonlik, uning turlari, shakllari, kiberzo‘ravonlikka uchraganda nimalar qilish zarurligi kabi ma’lumotlar joylashtirilgan, **to‘g‘ridan to‘g‘ri tegishli organlarga murojaat qilish, psixologik yordam ko‘rsatish imkoniyati** mavjud bo‘lgan **ixtisoslashtirilgan saytlar yaratish**;

2. Kiberzo‘ravonlik turlari, xususan, kiberbulling, kiberstalking, seksing, doksing, harrasment va boshqalar hamda ularning huquqiy oqibatlari haqida dastlabki tasavvur paydo bo‘lishi maqsadida **maktablarda yuqori sinf o‘quvchilari uchun maxsus kurslar, interaktiv metodlarga asoslangan seminar-treninglar** tashkil etish;

3. Kiberzo‘ravonlikning oldini olish, uning oqibatlarini yumshatishga qaratilgan loyihalar uchun **grantlar e’lon qilish, malakali milliy va xorijiy mutaxassislarni jalb qilish**;

4. Kiberzo‘ravonlikning oldini olishda **nodavlat notijorat tashkilotlarining faoliyatini rag‘batlantirish, davlat va nodavlat tashkilotlarning hamkorligini** ta’minlash;

5. Kiberzo‘ravonlik qarshi kurashish bo‘yicha **tegishli normativ-huquqiy hujjatlarni qabul qilish**, sohaning huquqiy asoslarini takomillashtirish.

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AN OVERVIEW OF THE TEXTBOOKS OF BILINGUAL ENGLISH LANGUAGE TEACHING IN MADRAS PRESIDENCY INDIA (1875-1900)

Asadullah Noor
Junior Teaching Assistant, Pashto Language and Literature Department
Uruzgan University
Email: asadnoorkh@gmail.com

Hayatullah Saar
Junior Teaching Assistant, Pashto Language and Literature Department
Uruzgan University
Email: hayatullah.sar2@gmail.com

Gul Ahmad Amirzai
Junior Teaching Assistant, English Language and Literature Department
Uruzgan University
Email: gul.amirzai@gmail.com

ABSTRACT

This historical study examines bilingual English textbooks in Madras Presidency (1875-1900) and the approaches and models mentioned in these materials. Bilingual education is often considered only as a remedial measure to language teaching in India. While various organizations and outreach programs employ bilingual approaches to education as part of inclusive action, subtractive approach to ELT is prevalent in mainstream education in India. This study seeks to retrace the history of bilingual textbooks in colonial Madras. The persisting need for English in India continues to cause much cultural asymmetry in contemporary India. English medium Education made Indian learners' language and reality impractical for 'good' Education. This research derives from the idea that when teaching draws from the learner's own language and context, it is easier for learners to relate to Education. It empowers them to make use of English in a way that does not uproot their own language and knowledge systems. This research aims to provide the big picture of bilingual education in India by showing how English was learnt by colonial Indians in 19th century Madras Presidency. In this context, this research studies the historical reasons, models and approaches related to bilingual English language teaching (BELT) for Indians in colonial Madras. The documents which act as textbooks/ manual/ guidelines/ directives/ sanctions for bilingual English language teaching (BELT) in colonial Madras are the basis for this study. This study adopts a data-driven theoretical framework, with a qualitative, exploratory paradigm. This research uses archival data, reflexive method, and interpretive analysis as part of the analysis process. The findings of this study suggest that bilingual English language teaching (BELT) materials have a long history in language teaching in India which has gone unexplored. The bilingual textbooks presented in the study show that colonial bilingual English language teaching (BELT) is a broad field of experimentation and debate which is often subsumed under the tag of grammar-translation method.

Keywords: Bilingual, English, Teaching, History, Madras.

Introduction

Mother tongue cannot be used accurately to identify the language which a person closely relates with. Instead, this study uses the term own language (which often is a person's first language or mother tongue) to pinpoint the language they own. Writing in the context of language rights and language planning (Cox, 2009). The term own language' has also been used to define students' preferences of dialects and language varieties in expressing themselves in the classroom (Schneider, 2011). The term bilingualism means the use of more than one language(Baker, 2011). Distinction between individual bilingualism and societal bilingualism to showcase how an individual might not be a bilingual while the community to which s/he belongs may be possessing more than one language. In addition to this distinction, Baker also explains how bilingualism can be out of choice or elective or by pressing situations/Circumstantial Depending on various sociolinguistic factors, an individual can be termed as a bilingual (Ghosh, 2006). Bilingual education is a broad term which encompasses education programs, teaching methods, models, approaches and techniques which often have varied goals. Bilingual education is instruction in two languages and the use of those two languages as mediums of instructions for any part, or all, of the school curriculum. Study of the history and culture associated with a student's mother tongue is considered an integral part of bilingual education (Arnot,2005). 21st century development, the importance of English was stabilized in post-independence India in the education policies drawn after 1947. But it can hardly be seen as a gradual, stable process. As both Phillipson (Skutnabb-Kangas & McCarty, 2010). In the Indian context, there is a lack of bilingual programs which use two languages as the medium of instruction (in teaching and textbook design) without sliding. Showcasing this lack has been pointed out in a research study by (Mahboob & Jain,2017).

Literature Review

Bilingual education has been considered as one of the potential research topics and researchers globally paid attention to the investigation of this topic in different contexts (Brisk, 2006; Abutalebi and Perani, 2015; Little, 2010).

Bilingual education is a complex and multifaceted field of study that has been the subject of extensive research over the past few decades. Here are some additional points to consider:

Types of bilingual education: There are many different types of bilingual education programs, including immersion programs, transitional bilingual programs, dual language programs, and heritage

language programs. Each of these programs has its own unique characteristics and goals.

Benefits of bilingual education: Research has shown that bilingual education can have numerous benefits for students, including improved academic achievement, better cognitive flexibility and problem-solving skills, enhanced cultural awareness and appreciation, and increased opportunities for future employment.

Challenges of bilingual education: Implementing effective bilingual education programs can be challenging, particularly in contexts where there is limited funding or support. Some of the challenges include finding qualified bilingual teachers, developing appropriate curricula and assessments, and addressing the needs of diverse student populations.

Policy and advocacy: Bilingual education policies vary widely across different countries and regions, and there is ongoing debate about the most effective approaches. Advocates for bilingual education argue that it is a critical tool for promoting social justice and equity, while opponents may argue that it is unnecessary or costly.

Likewise, the book of Little (2010) entitled "The Linguistic and Educational Integration of Children and Adolescents from Immigrant Backgrounds". This book examines the linguistic and educational integration of immigrant children and adolescents in the United States. It covers topics such as language acquisition, bilingual education, and the social and cultural contexts of immigrant education. This book provides a comprehensive overview of emerging bilingualism and its implications for bilingual education program design and implementation. It covers a range of topics, including language development, cultural competence, teacher preparation, and family engagement. In addition, "Bilingual Education: From Compensatory to Quality Schooling" is a similar book written by (Brisk, 2006). This book provides an overview of the history and evolution of bilingual education in the United States. It covers topics such as the legal and political contexts of bilingual education, the development of effective bilingual programs, and the impact of bilingual education on student achievement.

In addition to the number of books stated above, research also conducted research studies about this particular research topic such as research by (Abutalebi and Perani, 2015). This research article provides a comprehensive review of the cognitive benefits of bilingualism, particularly with regard to cognitive control and executive function.

These are just a few examples of the many research studies and literary works on bilingual education. There is a wide range

of literature available on this topic, depending on your specific interests and research needs.

Overall, bilingual education is a rich and complex field that encompasses a wide range of topics and issues. Whether you are interested in the cognitive benefits of bilingualism, the challenges of implementing bilingual education programs, or the policy debates surrounding this issue, there is a wealth of research and literature available to explore.

Methodology

The aim of this research is to describe the research design, data collection procedure, tools, and analytical models adopted as part of this research. This part will explain in detail the methodological underpinnings of this research. With this as the foundation, this part will also report an in-depth discussion about the research methods used to collect archival data. In the coming sections, the steps involved in building a research design for historical research of educational pasts will also be explained. This part is also a platform to showcase the circumlocutory manner of collecting archival evidence over a period of mentioned years, each time adding to the previous findings, altering assumptions and providing newer insights. This part is largely based on recollection, reflection, and notes written through the timeline of the study. For this purpose, the following sections will report, not only the details and techniques involved in historical research, but also pitfalls, dead-ends, and work-around devised as part of this research procedure. An elaborate description of the sample, and the reasons why such sample was chosen for this research will be reported. Additionally, the following sections will describe the data collection techniques used to obtain the archival data. This is an exploratory study which employs analysis of an interpretive analytic paradigm to report the data analysis. The following sub-sections will explain the research methodology and the research design paradigms employed in this study. The basic source of information which provides historical information are the archives. Archives are primary sources which can give an insight into a specific historical time period or phenomena a researcher seeks to understand. Archival research is the study of primary sources of information about the past. Archival study, across various disciplines, is sometimes perceived as research which is exclusively relegated to library and is done amidst dusty volumes of documents and tomes of library records. Critical Reflexive Approach (CRA) is a framework which requires the researcher to reflect critically on the historical processes of the past with the help of various primary sources. In line with the theoretical foundations of this

research, reflexive method is used in this study to classify data types and interpret the data. In this study, data collection followed a phase-bound process which began after extensive research about the archives which are available at various archival sites, both online and print. Before proceeding for data collection, the researcher used data tools to collect information about the data. Annotated bibliographies of English teaching material and grammars are an important data tool for this study. These bibliographies helped in locating textbooks which are not listed on library catalogues, and also highlighted the context and authorial history of teaching material.

Findings

Table 1. List of archival sites visited in Indian online libraries

Location	***Archival Sites***
Chennai	*Anna Library* *The College of Engineering* *Connemara Library* *Loyola College* *Madras Christian College Madras University* *Pachaiyappa's College Queen Mary's College* *Women's Christian College* *Madras Legislative Assembly Library* *Roja Mutthaiah Research Library*
Madurai	*The American CollegeLady Doak College* *Madura College* *Madras District Records Office* *Arasaradi Theological Seminary*

Table 2. List of collections consulted online visited in India and UK

Collections consulted In India (2014-16)	***Collections consulted in the UK (2016-17)***
• *Roja Muthaiah Research Library, Chennai* • *National Archives, Delhi* • *Connemara library, Chennai* • *Tamilnadu State Archives, Egmore,Chennai*	• *Bodleian collections, Oxford University,Oxford* • *Asia collections, Cambridge University,Cambridge* • *Missionary archives, SOAS, London* • *Asia and Africa collections, BritishLibrary, London*

Table 3. Preliminary classification of archival documents collected.

Teaching material	***Education policies and related debates***
• *Missionary teaching materials* • *Textbooks and other teaching material* • *Syllabi and related papers* • *Examination papers and debates relatedto examinations*	• *Government Pamphlet series (recommendations) on teaching* • *Histories of English language teaching inIndia* • *Non-governmental Pamphlet series(recommendations) on teaching* • *Public Instruction Reports by the Govt ofMadras Presidency* • *Textbook Committee reports*

Changing times: a brief overview (1875-1900)

The period 1875-1900 was a period of innovation in bilingual English language teaching material. As the Report of Public Instruction in Madras Presidency (1877) suggests, there was a surge in the publication of bilingual textbooks in the years following the textbook revision committee's report. This increase in bilingual textbooks was also a result of various other factors. The broad period 1870-1900 has been singled out as a distinct phase in colonial Indian education in many historical accounts The reason this pre-independence phase stands out distinctly is due to two important changes that took place in the 19th century colonial society – the first is the introduction of new educational policies and their impact on English language teaching in the 1870s. The second crucial factor is the new 'nation' space in which educated Indians recognized English education as a tool which can both oppress and empower them. The increase in the number of educated Indians led to their direct participation in textbook making, policy

building and education planning in colonial Madras Presidency. These factors, in addition to the textbook revision committee's reports led to the increase of BELT material after 1875. However, the decades after 1880s did not witness increase in the number of bilingual textbooks published by the government. After an initial upsurge, the government did not take to the preparation of BELT, which in turn gave rise to the production of bilingual and trilingual material published by local publishers.

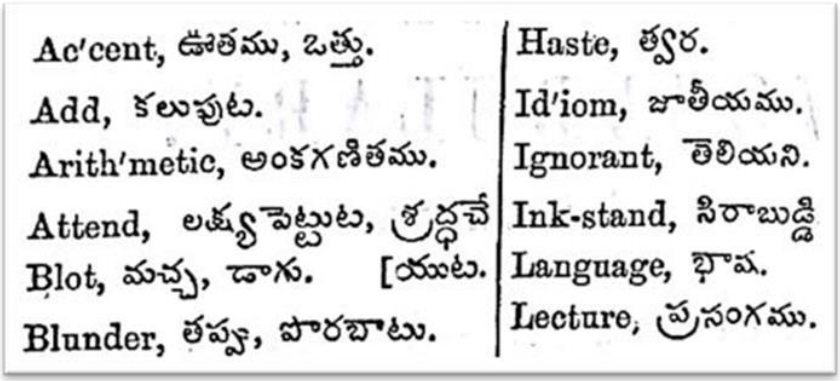
English and Telugu Grammatical Vocabulary Series

This section analyses two bilingual grammatical vocabularies published by the CVES in the late 19th century in Madras for use in school level teaching. With the help of these books, this section will define the meaning and function of a grammatical vocabulary in the context of bilingual English language teaching in colonial India. By the time the CVES published these vocabularies, the British government had already taken control of colonial education. Educators involved at the higher echelons of the Department of Public Instruction were also involved in the establishment of textbook-making as a commercial enterprise in colonial India (Riddick,2006). narrates the backstory of textbook making in colonial India where pedagogic goals went hand in hand with pecuniary ambitions. A member of the textbook revision committee in Madras Presidency, Lethbridge was also active in negotiating a profitable deal with publishers at Macmillan for the publication of a new series of textbooks specially made for Indian schools (Condie, 2014).). In addition, the 1870s saw a rise in the book publishing in Britain and a corresponding demand for making new textbooks in colonial India. It is however historically inaccurate to attribute the pedagogic reforms of late 19th century entirely to imperialist money-making intentions. The orientalist spirit of many British diplomats, various efforts of inter-racial collaboration, and innovations of colonial Indian literati also played an important role in English language teaching of late 19th century India, specifically Madras Presidency.

In this atmosphere of frantic book publishers from overseas vying for colonial Indian markets and newly educated Indian educationists and publishers making localized educational material, the CVES had published English and Telugu Vocabulary No. II & III (1881). There is no clear indication as to which grade these books may have been prepared for. On the basis of the complexity of words given in both the books, it can be ascertained that these vocabularies may have been prescribed for teaching English language to students of Grades V-VII (Lower secondary), studying in Mission Schools in the Telugu speaking areas of Madras Presidency. Vocabulary No. II is a 41-page bilingual vocabulary with accented words, syllable divisions and

indications of word stress. This textbook provides short lists of words based on themes such as education, animals, agriculture, natural objects, trades & professions, tools, service, visiting, travelling, merchandize, law, government, military affairs, religious and extracts from the word of God. Each lesson has 2 sections: first section is a list of words, and the second section is a set of sentences based on the theme of the lesson. Compared to the bilingual English language teaching material published by the CVES in the 1860s, the degree of religious content is minimal. It also reflects the extent to which the change in Colonial Indian government's stance towards Christian Missions also impacted colonial English language teaching in a large way. Given below is an excerpt from the vocabulary (Condie, 2014).

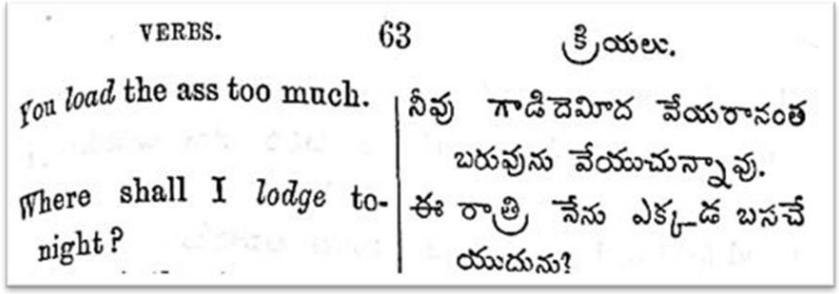
Figure 1. Excerpt from English and Telugu Vocabulary, No. II, pp.62



Ac'cent, ఊతము, ఒత్తు.
Add, కలుపుట.
Arith'metic, అంకగణితము.
Attend, లక్ష్యపెట్టుట, శ్రద్ధచే
Blot, మచ్చ, డాగు. [యుట.
Blunder, తప్పు, పొరబాటు.
Haste, త్వర.
Id'iom, జాతీయము.
Ignorant, తెలియని.
Ink-stand, సిరాబుడ్డి
Language, భాష.
Lecture, ప్రసంగము.

This bilingual grammatical vocabulary series is a simple manual which introduced five grammar concepts by way of examples. This school book does not provide grammatical definitions. Instead, it provides words belonging to a grammatical category in a sentence. The words which the learner is expected to notice (indicating a specific grammatical function) are italicized. It must be noted that this book is not a 'two-way' textbook, i.e., it does not attempt to teach the grammatical principles of English and Telugu in the same textbook. Like the Vocabulary No. II, the Grammatical Vocabulary also may have been used as supplementary material alongside the study of advanced monolingual grammars in government schools, as is the case with many of CVES's educational publications (Condie, 2014).

Figure 2 Excerpt from English and Telugu Vocabulary No.II, pp.63



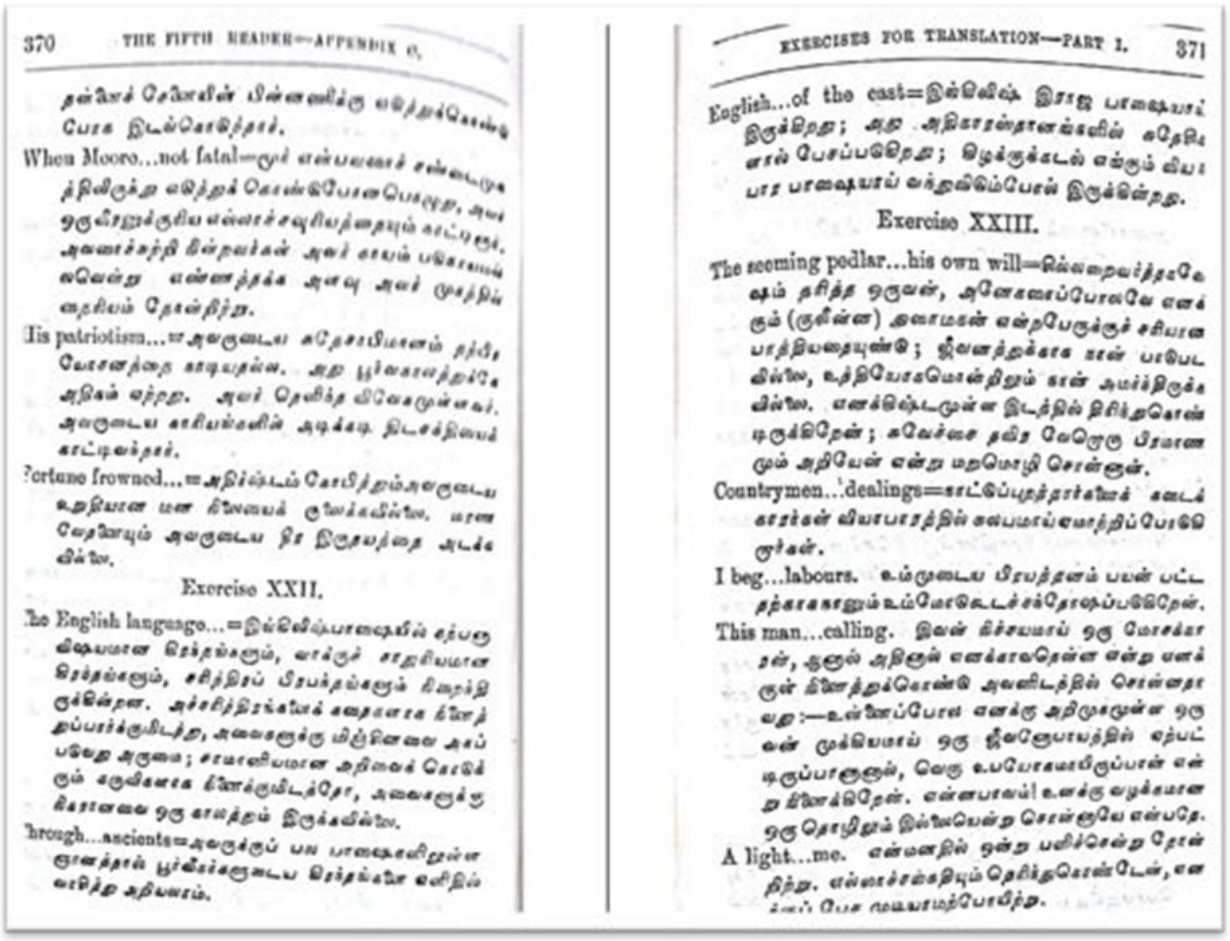
VERBS. 63 క్రియలు.

You *load* the ass too much. | నీవు గాడిదెమీద వేయరానంత బరువును వేయుచున్నావు.
Where shall I *lodge* to-night? | ఈ రాత్రి నేను ఎక్కడ బసచేయుదును?

Bradshaw's Fifth Reader

John Bradshaw's textbook is a singular textbook for many reasons. Firstly, Bradshaw chose to prepare a Chrestomathy in the form of a schoolbook for use in Grade 10 (Form V). In addition, he adopted a bilingual approach relying heavily on translation from English to Tamil to teach English. Bradshaw's textbook is a 396-page prose and poetry reader, with selections from authors of British origin. The Fifth Reader has five sections in Prose with each section consisting of three selections, with 15 lessons in total. The Poetry section comprises 48 poems. The textbook has two parts – the first part comprises a Chrestomathy that is completely in English. The second part of the textbook has much material by way of both teacher support, home-reading and exercises for the learners. The Chrestomathy (nearly 53% of the textbook) is a compilation of selections of prose and poetry suitable for school level teaching. The second part (nearly 47%) is dedicated to explanations, detailed notes, lessons on poetry and exercises on translation(Allender, 2009).

Figure 3. Excerpt from The Fifth Reader (1888) pp. 370-71



370 THE FIFTH READER—APPENDIX C.

Exercise XXII.

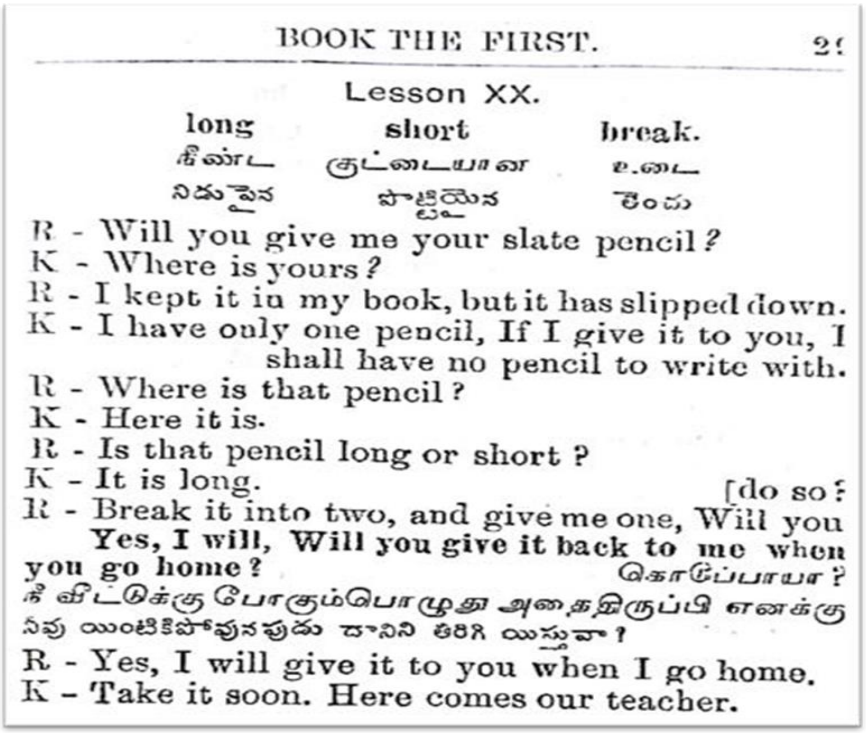
EXERCISES FOR TRANSLATION—PART I. 371

Exercise XXIII.

Trilingual English language teaching and the VNJ textbook series

With the decline of the CVES and other Christian educational societies, and the active participation of the British government in educational policy, and textbook making, there was a large quantity of English language teaching material published between 1850s and 1880s. The recommendations of the textbook revision committee for a new Imperial Series did not come to fruition – the suggestion for the new series was not implemented in a uniform fashion across India. Specifically, in Madras Presidency the government found it difficult to manage mass instruction. A common Imperial series of textbooks for all presidencies in India remained a recommendation. Instead, individual committees were constituted to ensure that textbooks with relevant content could be prepared separately for each of these presidencies. With the influx of local publishing houses, and the weakening of Missions in the area of textbook making, the government gradually ceded control of making educational material to local publishing houses.

Figure 4. Excerpt from T. Sreenivasavaradachari Lesson XX



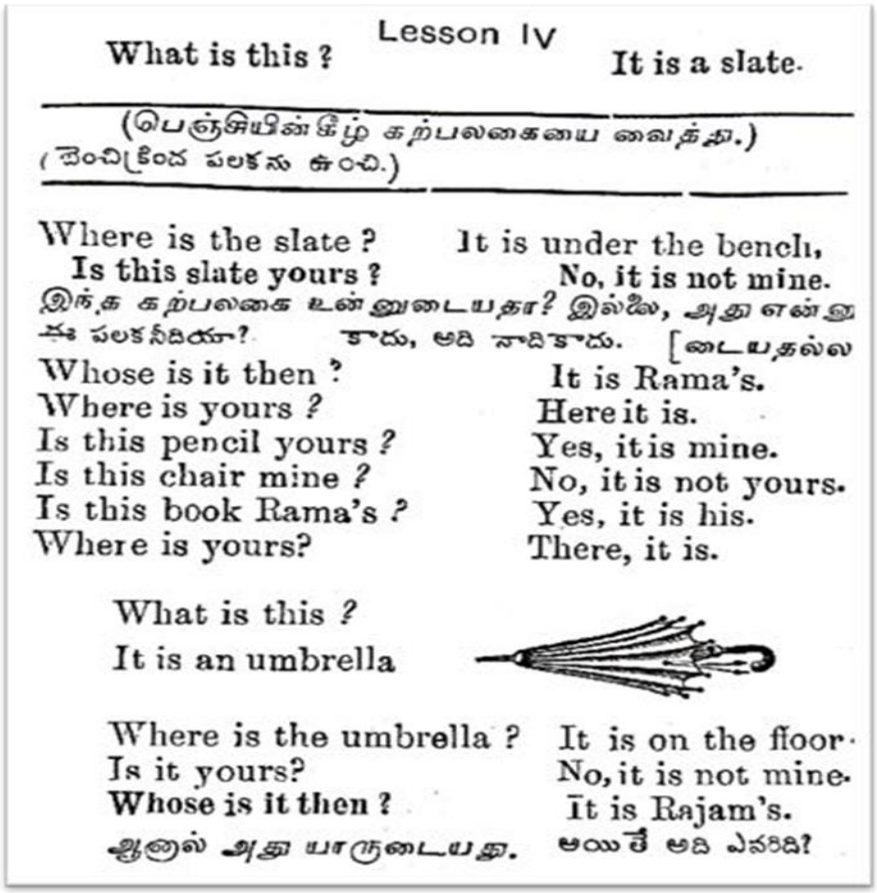
BOOK THE FIRST. 21

Lesson XX.

long	short	break.
கீண்ட	குட்டையான	உடை
నిడుపైన	పొట్టియైన	తెంచు

R - Will you give me your slate pencil?
K - Where is yours?
R - I kept it in my book, but it has slipped down.
K - I have only one pencil, If I give it to you, I shall have no pencil to write with.
R - Where is that pencil?
K - Here it is.
R - Is that pencil long or short?
K - It is long.
R - Break it into two, and give me one, Will you [do so?
Yes, I will, Will you give it back to me when you go home? கொடுப்பாயா?
நீ வீட்டுக்கு போகும்பொழுது அதைதிருப்பி எனக்கு
నీవు యింటికిపోవునపుడు దానిని తిరిగి యిస్తువా?
R - Yes, I will give it to you when I go home.
K - Take it soon. Here comes our teacher.

Figure 5. Excerpt from T. Sreenivasavaradachari, Lesson IV



Lesson IV

What is this ? It is a slate.

(பெஞ்சியின் கீழ் கற்பலகையை வைத்து.)
(బెంచిక్రింద పలకను ఉంచి.)

Where is the slate ? It is under the bench,
Is this slate yours ? No, it is not mine.
இந்த கற்பலகை உன்னுடையதா? இல்லை, அது என்னு
ఈ పలకనీదియా? కాదు, అది నాదికాదు. [டையதல்ல
Whose is it then ? It is Rama's.
Where is yours ? Here it is.
Is this pencil yours ? Yes, it is mine.
Is this chair mine ? No, it is not yours.
Is this book Rama's ? Yes, it is his.
Where is yours? There, it is.

What is this ?
It is an umbrella

Where is the umbrella ? It is on the floor.
Is it yours? No, it is not mine.
Whose is it then ? It is Rajam's.
ஆனால் அது யாருடையது. అయితే అది ఎవరిది?

Conclusion

This Research has analyzed textbooks in the period 1875-1900 to mark various approaches of bilingual English language teaching as evidenced in Madras. In addition, the tendencies and conflict between a monolingual and bilingual approach in colonial English language pedagogy has also been showcased. The first decades in 19th century saw the emphasis on the development of Indian Universities. The decades following 1900 also saw gradual political unrest based on linguistic communalism. This analysis ceases at the crossroads of conflicting attitudes towards bilingual English language teaching in colonial Madras Presidency at the cusp of 19th century. Overall, bilingual education is a rich and complex field that encompasses a wide range of topics and issues. Whether you are interested in the cognitive benefits of bilingualism, the challenges of implementing bilingual education programs, or the policy debates surrounding this issue, there is a wealth of research and literature available to explore.

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COMPARATIVE ANALYSIS OF THE CONSTITUTIONS OF THE COUNTRIES OF CENTRAL ASIA

Khojiakbar Hasan ugli Abdusamadov
A student of Tashkent State University of Law
abdusamadov.kh@gmail.com

ABSTRACT

The Constitution forms the legal basis of the country. It has the highest legal force and enshrines the rights, freedoms and duties of citizens. History clearly shows that the Constitution should not be amenable to change, as it is the core of society that ensures stability. Despite this, in today's information world, the Constitution should also be adapted to the requirements of the time. The Constitution should become the basis of reforms and the legal foundation of the Development Strategy of New Uzbekistan for 2022-2026.

The purpose of this work is to conduct an in-depth analysis of the Constitutions of the countries of Central Asia in order to identify similarities and differences. The countries of Central Asia gained their independence in one year, after the collapse of the USSR, this moment is key and allows us to highlight the starting point where they started. It is interesting to study what these countries have come to over 30 years of independence in the field of constitutional law, what difficulties they have overcome; and how the experience of one country can help a neighboring one.

Methodology:

The study is based on the methods of induction and analysis. The author in this paper compares the Constitutions of the countries of Central Asia and the available factors, derives a generalization. There is a connection of the object of study. The mentality, culture and development of countries were studied, based on the synthesis method. The method of analysis was used to study the differences between the Constitutions of the countries of Central Asia.

Keywords: Amendments, Adaptation, Reforms, Development Strategy, Central Asia, Independence, Collapse of the USSR, Constitutional law, Comparative constitutional studies.

The Constitution is not a dogma, it is
Should be a program for action
Akmal Saidov

KAZAKHSTAN:

The culture and mentality of Kazakhstan was formed on three principles: primordially traditional, colonial and Western influence. The reason for this is that Kazakhstan is between European and Asian civilizations.

The economic development of Kazakhstan is explained by the fact that it is very rich in natural resources, for example, energy and mineral. According to the IMD-2021 rating, Kazakhstan ranked 35th in the competitiveness ranking. In this ranking, the efficiency of the government, business, as well as the infrastructure of Kazakhstan was highly appreciated. These statistics indicate its importance and development on the world stage.

The first Constitution of independent Kazakhstan was adopted at the IX session of the Supreme Council of Kazakhstan of the XII convocation on January 28, 1993. But this Constitution lasted only two years. This Constitution of Kazakhstan was adopted on August 30, 1995 by a nationwide referendum.

The Constitution of the Republic of Kazakhstan was written in two languages - Kazakh and Russian. The Kazakh version turned out to be longer than the Russian version in terms of the number of words due to the specifics of the translation of legal terminology and the peculiarities of the language.

During the adoption of this Constitution, more than 30 thousand collective discussions were held, where more than three million Kazakhstanis took part. After discussions, almost 30,000 proposals were submitted. In particular, more than 1,100 amendments and additions were made to fifty-five articles. Although the referendum on the adoption of the new Constitution took place on August 30, it entered into force only on September 5, 1995, after the publication of the official results of the will of the people in the newspapers Yegemen Yazaystan and Kazakhstanskaya Pravda.

Amendments and additions were made to the current Constitution four times - in 1998, 2007, 2011 and 2017. The first changes included changing the terms and powers of the President and deputies. The 2007 amendments provided that Kazakhstanis would no longer vote for a specific person, but for a specific party. In February 2011, the Constitution was amended regarding the basis for the appointment and election of the President of the country. At the same time, Nursultan Nazarbayev, the first President of Kazakhstan, received the status of "Elbasy".
And in 2017, part of the powers of the President were transferred to the Parliament and the Government.

As for the composition of the Constitution of Kazakhstan, it consists of 98 articles, which are grouped into 9 sections. In the preamble, Kazakhstanis recognize themselves as civil society.

Similarities with the Constitution of Uzbekistan:

1) The Constitution of Kazakhstan states that international treaties ratified in this country take precedence over its laws. This means that Kazakhstan recognizes the international treaties that it has signed above its normative acts. This is also observed in our law. For example, the preamble to the Constitution of the Republic of Uzbekistan states that the Constitution was created recognizing the priority of universally recognized norms of international law

2) Similarities are also observed in the rules governing family relations. For example, paragraph 3 of Article 23 tells us that adult able-bodied children are obliged to take care of disabled parents. In the Constitution of Uzbekistan, such a provision is provided for in Article 66 of the Constitution of the Republic of Uzbekistan. This rule at the constitutional level consolidates our traditions regarding respect and care for the older generation.

Differences with the Constitution of Uzbekistan:

1) In paragraph 1 of Art. 2 The Republic of Kazakhstan (hereinafter RK) states that Kazakhstan is a unitary state with a presidential form of government. As for Uzbekistan, we do not have an article that would clearly indicate the structure of the state. For example, Uzbekistan is considered a unitary state with signs of a federation, but the opinions of scientists differ on this point, because of this, the territorial structure of Uzbekistan should be precisely determined. But according to the form of government, Uzbekistan is also presidential.

2) clause 3.1. Art. 2 says that within the city of Nursultan a special legal regime can be established in the financial and legal spheres. To implement this article, the constitutional law “On the Astana International Financial Center” was adopted. This NLA states that there is an international financial center in the city of Nur-Sultan, which enjoys special prestige. For example, according to Art. 4 of the law “On the Astana International Financial Center”, in the city of Nur-Sultan, along with local laws, there are norms, precedents of the law of England and Wales, because they are considered the standards of the world's leading financial centers. Another reason for the introduction of the Anglo-Saxon legal system is the creation of favorable conditions for foreign investors. Also, according to Art. 6 of this NPA, the Participants of the Center until January 1, 2066 are exempt from paying corporate income tax. This center is also distinguished by the fact that it has its own management, for

example, the Council for the Management of the Center, the court of the center, the international arbitration center. If we consider in more detail the court of this center, then it has a special legal status and resolves issues that have arisen only in this center. It has only 2 instances - first and appeal. The official language of the center is English. This was done to attract investors and turn the city of Nur-Sultan into an international financial center.

3) paragraph 3 of Art. 6 tells us that the Earth, its subsoil, water, flora and fauna, and other natural resources are state property. Land may also be privately owned.

4) In paragraph 3 of Art. 10 states that Kazakhstan does not recognize the citizenship of another state.

5) Art. 15 paragraph 2 allows for the possibility of the death penalty. It is established by law as an exceptional measure of punishment for terrorist crimes accompanied by the death of people, as well as for especially grave crimes committed in wartime.

6) According to paragraph 2 of Art. 41, A citizen of Kazakhstan by birth, not younger than forty years old, fluent in the state language, living in Kazakhstan for the last fifteen years and having a higher education may be elected President of the Republic of Kazakhstan.

7) In paragraph 5 of Art. 42 states that the same person cannot be elected President of the Republic more than twice in a row, but this restriction does not apply to the First President of the Republic of Kazakhstan, Nursultan Nazarbayev.

8) In paragraph 1 of Art. 70 provides the right of ex-Presidents of Kazakhstan to become life members of the Constitutional Council. And in Uzbekistan, the ex-President can only become a life member of the Senate.

9) In paragraph 2 of Art. 91 provides the invariable provisions of the Constitution of Kazakhstan. Examples of them: unitarity and territorial integrity, the form of government, as well as the fundamental principles of the country's activities, laid down by the Founder of independent Kazakhstan, the First President of the Republic of Kazakhstan - Elbasy.

10) In paragraph 1 of Art. 95 states that one half of the deputies of the Senate is elected for 4 years, while the other half of the deputies - for a term of two years.

Proposals to the Constitution of Uzbekistan:

1) Clause 1 of Article 1 can be adopted from the Constitution of Kazakhstan. It talks about the fundamental principles of Kazakhstan's activities, namely: public harmony and

political stability, economic development, patriotism, the solution of the most important issues of public life at a republican referendum or in Parliament.

2) In paragraph 2 of Art. 7 shows that the Russian language has an official status, because of this it is used in state organizations and local governments on a par with Kazakh.

3) In paragraph 2 of Art. 19 states that everyone can use their native language and culture, can freely choose the language of communication, education, training and creativity.

4) In paragraph 2 of Art. 75 states that in some cases criminal trials are carried out with the participation of jurors

5) paragraph 3 of Art. 77 states that laws that worsen the situation of citizens, establish or increase responsibility, impose new duties do not have retroactive effect. But if, after the commission of the offense, a law was passed that mitigates or cancels liability, then a new law applies;

6) paragraph 3 of Art. 77 leads that the clergy should not testify against those who trusted them in confession. Evidence obtained illegally is not valid. No one can be condemned on the basis of his own confession alone;

TURKMENISTAN:

The culture and mentality of Turkmenistan is slightly different from other Central Asian countries. this is explained by the fact that the ancestors of the Turkmens are nomads, while the ancestors of the Uzbeks or Tajiks were sedentary. In the mentality of Turkmens, love for horses is strongly manifested. For Turkmens, a horse is a symbol of the country. It is customary to see photographs of horses in their homes, instead of family members.

Another difference of the Turkmen society is hierarchy. The order of older people must be executed immediately and without hesitation. For Turkmens, fur hats are the dignity of men. You can not tear it off the head of the owner. This is considered an insult.

The economy of Turkmenistan is distinguished by the sale and sale of a large amount of natural resources. Investors are only allowed to extract complex deposits of natural resources. The main gas exporter of Turkmenistan is Russia, because through its pipelines Turkmen gas reaches the European market.

In 2018, Turkmenistan entered the TOP-3 in terms of economic growth. And in terms of natural gas reserves, it ranks 4th in the world, and 10th in terms of production. Export of Turkmenistan is 2.2 times more than import. The main sectors of the economy are oil and gas production, agriculture, and metallurgy.

The Turkmen people are trying to create a strong welfare state. Through constitutional reforms, Turkmenistan has established free public services. For example, Turkmenistan is the only country where gas, electricity and water are provided free of charge. It should be noted that in the total amount of cash expenditures of households in Turkmenistan, expenditures on housing and communal services account for only 0.1% and are the lowest in the world.

Thanks to the constitutional reforms of 2016, Turkmenistan became the first country in the world to have the principle of neutrality recognized by the UN. The Constitution provides for non-interference in the internal affairs of other states, non-use of force, non-alignment with military blocs and associations, and promotion of peaceful relations. Thanks to the policy of neutrality, Turkmenistan consistently and purposefully implement large-scale reforms in the oil and gas, transport, construction, chemical, energy, agricultural and other sectors of the economy, as well as in the social sphere.

If we consider the composition of the Constitution of Turkmenistan, it should be noted that it consists of 8 sections and 142 articles. Unlike the Constitution of the Republic of Uzbekistan (hereinafter referred to as the RUz), not all sections are divided into chapters. Only section 3 (The system of public authorities in Turkmenistan) has 6 chapters.

The result of the constitutional reform of 2016 was that the age limit for a candidate for the presidency, which was 70 years old, was abolished. In turn, the term of office of the President was extended from 5 to 7 years.

In the same year, a section called “Economy and the financial and credit system” was added, and article 139 of this section states that the national currency of Turkmenistan is the manat, and the circulation of foreign currency in the country is regulated by a separate law. Also, these reforms reflected the main principle of Turkmenistan's foreign policy as neutrality. As a result of the constitutional reforms of 2016, 28 new articles were added, 24 of which were new, and 4 existing articles were reworded, 107 articles were changed and supplemented

On September 25, 2020, a new 9th edition of the Constitution was adopted. The text of the law "On amendments and additions to the Constitution of Turkmenistan" was published in the newspaper "Neutral Turkmenistan" dated September 26, 2020. . Then the changes affected thirty-one articles of the Constitution out of 142, where there are references to the Parliament of Turkmenistan. The name of the parliament, Mejlis, was changed to Milli Gengesh (National Council). The peculiarity of this reform was that after that the Parliament of Turkmenistan became

bicameral. The bicameral parliament began to function from January 1, 2021. The Mejlis, which had previously been a unicameral parliament, became the lower house, and the Halk Maslakhaty, which previously existed as a body separate from the Mejlis, became the upper house. It should be noted that in Uzbekistan the parliament became bicameral in 2005.

In the constitutional reform of 2020, the concept of an ex-president was introduced, who automatically receives a seat in the Halk Maslakhaty.

Similarities with the Constitution of Uzbekistan:

• Article 17 provides for political diversity and a multi-party system.

• According to Art. 71. The President of Turkmenistan is the supreme commander in chief.

Differences with the Constitution of Uzbekistan:

• Art. 10 tells us that a citizen of Turkmenistan is not recognized as a citizen of another state. This means that dual citizenship is prohibited in Turkmenistan. It is also said that a citizen of Turkmenistan cannot be extradited to another state, expelled from Turkmenistan or limited in the right to return to his homeland.

• Art. 11 guarantees the rights and freedoms of foreign citizens and stateless persons.

• According to Article 76, in Turkmenistan, the President may transfer some of his powers related to foreign policy, awarding. pardon and amnesty.

• According to Art. 91 In Turkmenistan, the head of the executive branch is the President, while in Uzbekistan this position is occupied by the Prime Minister.

Proposals to the Constitution of Uzbekistan:

• The Constitution of Turkmenistan already in the preamble guarantees the rights and freedoms of man and citizen, and also affirms the principle of permanent neutrality.

• Art. 2 states that the Resolutions of the UN General Assembly on the "Permanent Neutrality of Turkmenistan" were adopted. It also states that the permanent neutrality of Turkmenistan is the basis of its domestic and foreign policy.

• Art. 32 states that the death penalty has been abolished in Turkmenistan. Here, at the constitutional level, the people fix that they are against the death penalty.

• Turkmenistan has a separate Article 40 regulating family relations. This article establishes the right to form a family, the equality of spouses, the rights and obligations of parents in raising their children.

• Article 46 establishes equal opportunities for citizens to access public service and the right to participate in the administration of justice.

• Art. 62 speaks of the admissibility of evidence. It says here that evidence obtained in violation of the law is null and void. It also establishes the right of citizens not to testify against themselves or their relatives..

• Art. 63 states that laws that worsen the situation of a citizen do not have retroactive effect..

• According to Art. 71, the President of Turkmenistan does not have the right of suspensive veto in relation to constitutional laws on the adoption of the Constitution, amendments and additions to it.

• According to Art. 141, in Turkmenistan it is impossible to change the form of government, i. it must always remain presidential.

KYRGYZSTAN:

Kyrgyzstan is a country where 65% of the territory is occupied by mountains. Kyrgyzstan is rich in natural resources, which are necessary for the development of agriculture and hydropower.

Today, Kyrgyzstan has found its place on the world stage. It is important to note that 115 countries recognize Kyrgyzstan and it has established diplomatic relations with almost 100 countries. In international relations, Kyrgyzstan achieves significant success, for example, in 2021 it ranked 93rd in the world in terms of military power. Also, the gross national income in Kyrgyzstan in 2021 reached $1,240 and ranked 169th in the world.

The Constitution of Kyrgyzstan was adopted on May 5, 1993 at the 12th session of the Supreme Council of Kyrgyzstan. Then the Constitution consisted of 8 chapters and 97 articles. The first five amendments were made during the presidency of Askar Akayev, in 1994, 1996, 1998, 2001 and 2003. On February 10, 1996, on the basis of a referendum, a bicameral parliament, the Jogorku Kenesh, was formed, consisting of the Legislative Assembly and the People's Assembly. On October 17, 1998, private ownership of land was introduced. On December 24, 2001, the Russian language was given the status of an official language. On February 2, 2003, a new version of the Constitution was adopted. In 2006, Kyrgyzstan adopted a new Constitution, but the Constitutional Court did not recognize it and canceled it. As a result, in 2007 a referendum was held, which resulted in the following: the parliament began to be elected according to the proportional system, the President received greater rights to dismiss the government and civil servants. They also established a rule that the same candidate cannot become President twice in a row. In 2010, they adopted a new version of the Constitution, where they imposed a ban on amendments until 2020. But still, in 2016, amendments were made to the basic law, according to which the rights of the

President were limited, while the heads of government, on the contrary, were expanded.

The last amendments were made on May 5, 2021 and they became the eighty-first in a row. According to the results of the 2021 referendum, the President began to replace the Prime Minister and began to lead the executive branch. Complicated the impeachment process. The number of parliament deputies was reduced from 120 to 90. A new advisory, supervisory body, the People's Kurultai, was created, which gives directions on social development. This body is mentioned in Article 7 of the Constitution of Kyrgyzstan. The Constitutional Court was created instead of the Constitutional Chamber.

The Constitution of Kyrgyzstan consists of 5 sections, 14 chapters and 116 articles.

Similarities with the Constitution of Uzbekistan:

• Article 11 states that Kyrgyzstan does not have aggressive and military goals. In Kyrgyzstan, it is forbidden to use the armed forces to solve internal political problems.

• According to article 20, respect and care for parents is considered a sacred duty of children. Children, in turn, are the most important value of Kyrgyzstan. Also in article 21 there is a mention of their sacred tradition, to honor the elders and respect the younger.

Differences with the Constitution of Uzbekistan:

• In the preamble there is a mention of the epic of the Kyrgyz people "Manas". This work is included in the UNESCO Intangible Cultural Heritage List, as well as in the Guinness Book of Records as the largest epic in the world. The Kyrgyz revere and follow the precepts of Manas the Magnanimous, the protagonist of this epic.

• Article 1 states that Kyrgyzstan is an independent, sovereign democratic, unitary, legal, secular and social state. While the Constitution of Uzbekistan states only that Uzbekistan is a sovereign democratic republic.

• The Constitution itself, in Article 23, states that human rights and freedoms can be limited to protect national security, public order and in wartime.

• Article 29 states that no one may be prosecuted for disseminating information that discredits or degrades the honor and dignity of a person.

• Article 73 states that the President can be prosecuted after being removed from power for violating the Constitution and for interfering in the affairs of the Jogorku Kenesh, as well as the court.

• Article 85 of the Constitution establishes that the legislative initiative belongs to 10,000 voters as a people's

initiative and they are mentioned in the same row as such subjects as the President and the Prosecutor General.

• Article 92 states that the resignation of the Chairman of the Cabinet of Ministers does not entail the resignation of the entire Cabinet of Ministers. And in the Constitution of Uzbekistan, Article 98 states that in the event of dismissal of the Prime Minister, the entire Cabinet of Ministers resigns.

Proposals to the Constitution of Uzbekistan:

• Article 5, paragraph 2 states that the usurpation of power, that is, its seizure, is a particularly serious crime.

• According to Article 13, the Russian language also enjoys the status of an official language.

• Article 25 clearly states that the death penalty is prohibited.

• The Kyrgyz Republic has established the principle of ensuring the best interests of the child, which is included in Article 27 of the Constitution. This principle is established in accordance with the Convention on the Rights of the Child. For example, this principle states that due consideration should be given to the views of the child. We must ensure the survival and healthy development of the child to the maximum extent possible.

• The ban on forced labor, exploitation of child labor, human trafficking and slavery is approved at the constitutional level and is included in Article 28 of the Constitution.

• Article 42 of the Constitution establishes the right of citizens to strike. This right comes from the International Covenant on Economic, Social and Cultural Rights, and Kyrgyzstan acceded to it on January 12, 1994

• Paragraph 2 of Article 51 allowed dual citizenship. A citizen of Kyrgyzstan who has acquired citizenship of another country receives the status of a compatriot with foreign citizenship. He is granted the right to visa-free entry and exit to his homeland, employment without a permit, temporary residence and education, it will be possible to use the services of medical institutions, and such a person is issued a Meken Card for 10 years.

• Paragraph 5, Article 59 refers to the provisions of the Miranda Act. It says that the detainee must be told the reasons for his detention, as well as explain his rights.

• Article 60 establishes that a law that aggravates a person's liability does not have retroactive effect. It is also mentioned here that the criminal law by analogy does not apply, because the analogy of the criminal law contradicts the requirements of the principle of

legality, allowing derogation from it in practice. Such a norm is also established in the Constitution of Kazakhstan.

• According to Article 115, citizens are allowed to establish aksakal courts. They specialize in handling cases to reconcile the parties.

TAJIKISTAN:

Tajikistan is one of the states with a developed culture and mentality. The Tajik mentality is characterized by humanism and collectivism. Tajiks are distinguished by hospitality and tolerance, expressed by the requirements of the Islamic religion, which educates a person in a spirit of respect for the opinions and positions of others. The culture and traditions of the Tajik people are also manifested in lawmaking, examples of which are such laws as “On the regulation of traditions and customs”, “On the responsibility of parents for raising children”. They are aimed at protecting the traditions and customs of the Tajik people.

When we consider the economy of Tajikistan, it should be noted that 93% of the country's territory is in the mountains. Because of this factor, Tajikistan is rich in mineral resources, more than 400 deposits have been explored, about 100 of them are being exploited, 40 types of minerals are mined. The economy is based on industry and agriculture. Tajikistan's external debt is decreasing, due to the fact that the country's gold reserves increased 60 times over 15 years from 2000 to 2015.

Tajikistan has an important place in the international arena, it has been recognized by 151 countries, the country has established diplomatic relations with 126 of them, has become a member of 51 organizations. The experience of the Tajik people in establishing peace and national accord, gained as a result of the civil war, is recognized by the world community. Tajikistan has an open door policy.

In terms of development, Tajikistan has made progress in reducing poverty and developing the economy. Between 2009 and 2019, the poverty rate fell from 83% to 26.3% of the population, and economic growth averaged 7% per year. Thanks to the national development strategy for the period up to 2030, adopted in Tajikistan, it is planned to increase the income of the population by 3.5 times by 2030 and reduce the level of poverty by half. Tajik President Emomali Rakhion noted that the share of the private sector in the economy was 70% of GDP. Tajikistan has established diplomatic relations with 160 states and has become a member of 51 international organizations. The Constitution of Tajikistan is not divided into sections, consists of 10 chapters and 100 articles, as well as a transitional provision. It was adopted by referendum on November 6, 1994. At that time, a civil war was taking place in Tajikistan. The draft Constitution was created by two commissions. The first draft of the Constitution was published for

discussion in April 1992, in the newspaper "Jumhuriyat". This project was prepared by the second working group under the leadership of Nurullo Khuvaidulloev, who at that time held the position of the Prosecutor General. In 1993, work continued on the creation of the Constitution. Two versions of the Constitution were drawn up - one for the Presidential Republic, and the other for the Parliamentary Republic. It is worth noting the participation of the people in the creation of the Constitution. As a result of the discussion of the draft Constitution, more than 7 thousand proposals were received from the people.

The Constitution of Tajikistan has undergone a number of changes. For example, since independence, 3 amendments have been made to the Constitution of Tajikistan, in 1999, 2003 and 2016. The result of the referendum in 1999 was the permission to register religious political parties. This was a condition of the peace agreement and ended the 1992–1997 civil war in Tajikistan. The term of office of the President was also extended to 7 years, but in one term. A significant result of the 1999 referendum is the creation of a bicameral Parliament, the Majlisi Oli. Now the Parliament of Tajikistan consists of the chambers of the Majlisi Milli and the Majlisi Namoyandagon. At the 2003 referendum, 56 amendments were considered, the main among them is the extension of the Presidential term for 7 years, but already for two terms.

In the 2016 referendum, the people were limited in their choice. An example is that people could only answer “yes” or “no” and voted on all 50 amendments at once. This referendum considered the possibility of Emomali Rahmon being re-elected an unlimited number of times. They also reduced the age limit for a presidential candidate from 35 to 30 years. They introduced a ban on the creation of parties of a religious and atheistic nature.

Similarities to the Constitution of Uzbekistan:

• Tajikistan is another Central Asian country with an autonomous territory. The country consists of the Gorno-Badakhshan Autonomous Oblast and other regions, according to Article 7.

• According to Article 49, every ex-President of Tajikistan becomes a member of the Majlisi Milli for life, unless he renounces this right.

• Article 53 tells us that the representative of the Gorno-Badakhshan Autonomous Region is one of the Deputy Chairmen of the Majlisi Milli.

• In accordance with Article 78, Tajikistan has a self-government body in the township and village, which is called Jamoat.

Differences with the Constitution of Uzbekistan:

• Dual citizenship is not allowed in Tajikistan, as Article 15 of the Constitution states that citizens of Tajikistan cannot be citizens of another state.

• According to Article 64, the President of Tajikistan is both the head of state and the head of the executive branch.

• Article 65 observes the possibility for the Leader of the Nation, Emomali Rahmon, to run for President more than twice in a row, but at that time it is generally prohibited.

Proposals to the Constitution of Uzbekistan:

• Article 1 of the Constitution of Tajikistan states that Tajikistan is a social state that creates conditions that ensure a decent life and free development of a person.

• Article 2 establishes the status of the Russian language as the language of interethnic communication.

• Article 11 establishes that Tajikistan can be a member of commonwealths, international organizations, and also cooperates with foreign compatriots.

• Article 46 clearly spells out the conditions for declaring a state of emergency. According to this article, a state of emergency is declared when there is a threat to human rights, the independence of the country and its territorial integrity, as well as due to disasters. It is established that the state of emergency is 3 months and then it can be extended.

• In accordance with Article 51, a free deputy mandate is established in Tajikistan. For example, a member of the Majlisi Milli and a deputy of the Majlisi Namoyandagon does not depend on the will of the voters, can freely express his opinion and vote according to his conviction.

• Article 100 of the Constitution establishes constitutional norms that are not subject to change. This is a republican form of government, territorial integrity, as well as the democratic, legal, secular and social essence of the state.

Conclusion:

Based on the foregoing, we can conclude that the Constitutions of the countries of Central Asia have much in common, but at the same time, there are differences.

Some constitutional norms can be introduced into the Constitution of Uzbekistan to improve it. Examples of such norms are: based on the experience of Kazakhstan, it is possible to introduce a special financial and legal position in the capital to turn it into an international business center, which will help attract foreign capital. It is possible to give the Russian language the status of an international or official language.

Having studied the experience of Turkmenistan, it is possible to apply the principle of permanent neutrality. It is possible to adopt the experience of Kyrgyzstan in implementing the principle of ensuring the best interests of the child. On the basis of the international pact on economic, social and cultural rights, the right to strike can be introduced into the Constitution. On the example of Kyrgyzstan, some norms from the Miranda law can be introduced. In order for the Constitution to be the pillar of society and the foundation of development, it must meet the requirements of the time and change. This can be confirmed by the words of **Winston Churchill that "To become better means to change, to be the best of the best means to change constantly."**

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ENGLISH FOR SPECIFIC PURPOSES IN ENGLISH LANGUAGE TEACHING

Sevara Anvar qizi Yeshboyeva
Tashkent university of humanities,Uzbekistan
ysevaranvarovna@gmail.com

ABSTRACT

English for specific purposes in language teachingis a language approach whose goal is to provide learners with narrowly defined goals the language elements they need to function as professionals. It focuses on and is directed toward English education and learning and is concerned with teaching a precise style of English to learners with particular objectives. The environment-related challenges include a shortage of instructional resources, courses with excessive students, and a heavy emphasis on examinations. This article examines students' and instructors' roles and related environmental challenges faced in teaching English for Specific Purposes, as well as the basic overview and instructional strategy of ESP in ELT (English Language Teaching). It also includes the encounters that arise when teaching ESP due to these and other factors.

Keywords: English Language Teaching, English for Specific Purposes,teacher's role, student's role, learners.

INTRODUCTION

The term "specific" in English for Specific Purposes (ESP) refers to the specific purpose of learning English [1]. The English for Specific Purposes (ESP) approach improves the relevance of what the students/learners are learning, then enables them to use English that they have known before. English for Specific Purposes (ESP) assesses the students and learners' needs and it integrates motivation, subject matter, and content for the teaching of relevant skills. Teaching and learning English as a second or foreign language with the end goal of using English in a particular sector is known as "English for specific purposes" (ESP)[2]. English for Specific Purposes (ESP), as defined by Hans and Hans (2015)[1], emphasizes teaching language in context more than linguistics and grammar. It includes accounting, computer sciences, tourism, business management, etc. English is not taught as a topic apart from the students' actual world but rather incorporated intoa subject area essential to the learners. In ESP, a requirement analysis identifies which language skills students and

learners need most, and the curriculum is constructed accordingly. The explanation claims that ESP is the main objective and is founded on the teaching and learning of English in order to meet the specific academic needs of individual students. Finance, Business, Management, Economics, Information Technology, Government, and Tourism Students and Professionals' ability to use their English language skills in their chosen industries is a powerful motivator, and this is where English for Specific Purposes (ESP) comes in. They retain more information and become more motivated to study English when they use the terminology and ideas acquired in a relevant situation. Subject-matter skills increase pupils' English skills. Students/learners require subject-matter expertise to grasp classroom English. In ESP lessons, students learn how to explain subject matter adequately in English. Teachers may use students' topic expertise to speed up their English learning. This article discusses the instructor's and student's involvement in ESP (English for Specific Purposes) instruction within ELT (English Language Teaching), as well as other subjects connected to the instructor, student, environment, and ESP instruction (ESP). In English for Specific Purposes (ESP)classes, the students/learners are shown how the subject-matter content isexpressed well in English. The teachers can make the most of the students'knowledge of the subject matter so that it helps them can learn English faster.

Therefore, in this article will provide: 1) general overview and coursedesign of English for Specific Purposes in the field of ELT (English LanguageTeaching), 2) the role of teacher and student in English for Specific Purposes(ESP), and 3) the difficulties related to teacher, student, environment and others inteaching English for Specific Purposes (ESP.

DISCUSSION

Nature of English for Specific Purposes (ESP)

English for Specific Purposes (ESP) the emphasis is on “Specific English”that belongs toany particular discipline, occupation or activity [3]. English for Specific Purposes (ESP) has become a fruitful field over the last three decades. [4]. As a learner-centered approach, its main purpose hasbeen that of fulfilling the specific needs of target learners to satisfy theirprofessional or vocational demands. Hutchinson and Waters state that in English for Specific Purposes(ESP) context, the outcomes of the historical occurrences resulted from a numberof people across the globe who wanted to learn the English language due to the key language in the fields of science, technology, and commerce. The emergence of English for Specific Purposes (ESP) teaching

movement is caused by the English language needs of the learners for specific purposes in relation to their professions or job description[5]. Howatt states that since the emergent yearsin the 1960s, ESP has become a vital and innovative activity within the Teaching of English as a Foreign or Second Language movement (TEFL/TESL)[6].Hutchinson and Waters define that ESP is an approach to language learning and it is based on learners' needs. It shows that ESP does not involve aparticular kind of language, teaching material or methodology", but they suggest that the foundation of ESP involves the learners, the language required and the learning contexts which are based on the primacy of need in English for Specific Purposes (ESP).[5]

Doand Cai state that ESP is English courses based on survey results and needs analysis in order to determine the specific activities that students/learners have to do as well as the final goal they want to achieve.[7]

Therefore, English for Specific Purposes (ESP) is an English course in which the textbooks and materials are adjusted to learners' desires and purposes. Robinson's definition of ESP is based on two criteria they are: 1) ESP is normally'goal-directed', and 2) ESP courses are developed from a needs analysis whichaim to specify what exactly it is that the students have to go through the medium of English, and a number of characteristics which explain that ESP courses are generally constrained by a limited time period in which their objectives/goals have to be achieved and are taught to adults in homogenous and various classes in terms of the work or specialist studies that the students/learners are involved in. [8]Based on the definitions above, it can be concluded that English for Specific Purposes (ESP) is learning English for a specific purpose to get specific goals.Needs assessment or need analysis in ESP reaching ESP should not be considered as a different kind of teaching the language, but it is as an approach as it is also based on the common belief of teaching language for communicative purposes.

English for Specific Purposes'Advantages

The use of English for Specific Purposes has several priorities, and the first is the speed of schooling. ESP boosts the acquisition of required linguistic abilities. This is because it adheres to the pattern of native speakers learning languages for particular reasons, in which speakers pick up a language in artificial circumstances as they need it. ESP not only focuses on these patterns but also enhances them by offering the chance to learn in a quick, intense setting. The second is learning efficiency. On an ESP, course trainees make themaximal use of their learning resources, all of which is brought to bear onacquiring specific, pre-identified linguistic items and skills.

Obviously, the needs analysis is of vital importance, since it enables trainers to determine the specificrequirements of teachers. The last one is practical learning. After finishing an ESP course, instructors may utilize language accurately in job-related activities indicated by need analysis. After the training, English is instantly job-ready. Teachers get job-related English training. Such preparations expedites academic success since no time is spent learning the language.

Course Design in English for Specific Purposes (ESP)

According to the fact that the learners have their objectives well defined from the very start, these are directly related to their practical, job based or professionally oriented needs, the choices the teachers have to make indesigning a course.

ESP course basically should be based on three elements, they are: 1) ESPhas to offer authentic materials, then it requires a purpose-related orientation,which means that a reasonable reality in which practitioners have the possibility toget involved in communicative tasks that replicate real situations is mandatory,and last but not least. 2) ESP should be defined by self -direction, i.e. learners areto become active users. 3) Then, in covering all areas of ESP that might play an essential role in the process of course elaboration, the ESP teachers should beready toask some questions and gather any information in the field to create an important database for further developments. The inquiries to be made are asfollowing:

1. The reason students/learners need to learn.
2. Subjects/persons will take part in the process (teacher, student, an expert in the field3. The place of the learning process going to take place. Whether the location provides any potential or imposes limitations.
4. Time of the learning process going to take place. It includes a time limit to be taken into consideration.

In concerning the syllabus design, the teachers have to face the prospect ofbeing bombarded with a great number of ready-made course books. However, ithas been designed with the purpose of easing the teachers of their worries ofsearching for the authentic materials. They offer teachers the possibility to selectactivities that meet the needs of the learners, but at the same time force them intobecoming “slaves” of the published textbooks, this plethoraof resources, reducing“individual instructors” motivation to construct their own course content with afocus on the immediate learners context and particular needs.

Teacher Training in English for Specific Purposes (ESP)

When placed in the classroom, instructors search for more training toadvance in their teaching careers, assuming that being a great speaker always qualifies one as a good teacher. According to Richards and Farrell (2005)[9], training programs are collections of tasks created for ESP and conventional English teachers. Preservice training, often known as teacher training, prepares those who want to teach English for the initial time for their professional responsibilities. At the same time, professional development for teachers refers to programs designed for people whoalready have teaching expertise. This kind of training is known as “in-service training” (Larsen-Freeman 2001)[10]. In-service training, as defined by Underhill (1986), is the process of upgrading the instructors' existing levels of knowledge. So that they might be “better”as professional teachers, it shapes practising instructors' activities [11]. It is not always possible to enrol in such formally structured training sessions. The majority of instructors of ESP, for example, look for ways to improve themselves on their own, such as by taking classes or seminars, reading books, and talking [5]. According to Vassilakis (2011), the primary objective of teachers is to be trained to take on specific pedagogical tasks. These tasks include understanding the requirements of the learners by assessing language and language abilities, offering pertinent information, and designing courses to meet those needs.

Teacher’s role in English for Specific Purposes (ESP)

Widdowson (1990) argues that the term “role” is used in various ways, butgenerally, a “role” is defined as a part of the performance in a certain social action.

Wright (1987) states that in daily life, we have several social roles. In languageteaching, a role determines the status of both the teacher and the student/learner,and it is subject to change, depending on the kind of activities happening in theclassroom. For example, a teacher can be as an evaluator and a teacher at the sametime (Nunan and Lamb, 1996).Sierocka (2008) defines that the ESP teacher has more roles to play besidesthe role of a “teacher”. Dudley-Evans and St John (1998) proposed five roles forthe teacher, such as a course designer and material provider, researcher,collaborator, and evaluator.

Learners' Roles in English for Specific Purposes (ESP)

ESP is a potent tool for such possibilities in this situation. The students will study English. While interacting with staff, they find it intriguing and necessary that they may utilize it in their future academics or professional activities. Most ESP students and learners know the contexts in which they will use English. Students and learners may place the

terminology and structures in the ESP classroom in a real-world context thanks to their subject-area knowledge. Their vocabularies are continually growing, they are getting more knowledgeable in their subjects, and they are adapting their language and conduct to fresh challenges or obligations. These inherent skills may help ESP kids master English more quickly. When a student's purpose is to use English in a specific field, the practice of teaching and studying English as a second or foreign language is known as "English for Specific Purposes" (ESP) (Paltridge & Starfield, 2014, p. 2).

Teachers of English for Specific Purposes Face ProblemsThe Quality of Both the Lectures and the Textbooks

Most of the materials used in ESP classes are intended to build abilities in hearing, speaking, reading, writing, and translation; nevertheless, some instructors think that providing their pupils with sufficient vocabulary is sufficient. Some of the textbooks made by instructors do not generate much interest among the students because they concentrate on reading skills and vocabulary activities most of the time. Lam (2011) claimed that students and other trainees often forget the terms they have learned following an examination.

Teachers' Educational Backgrounds and the Methods They Use in the teaching process

The challenges associated with teachers include differences in teachers' qualifications and teaching methods; because they have been prevented from taking ESL-specific training classes, they lack the specialist expertise necessary to teach the language effectively to their students (ESP). Ho (2011) stated that educators also confront challenges regarding the design of the curriculum, the tasks, the assignments, and the instructional strategies. Students are asked to participate actively in group activities, public speaking, keeping notes, and writing in English on the experiential learning or ideas they have received while in the classroom. However, frequently, the teachings do not turn out very well because of a lack of time or other factors. In addition, the professors developed the bulk of tests, which means that the evaluation of students' learning efficiency is incorrect.

Lack of Theoretical Framework to Support Teaching English for SpecificPurposes

Chen (2011) defines that the theoretical framework in supporting teaching English for Specific Purposes (ESP) is the challenge. The biggest problem is there is no theoretical framework to support teaching ESP. There are many opinions on whether this subject should be considered as a compulsory subject in the curriculum or should be considered as a

skill or practical knowledge to help the students/learners more confident with their knowledge after their graduation.

Using Vocabulary inadequately

Maruyama (1996) reports that he offered a list of 60 technical terms to 112 Japanese undergraduate electrical engineering courses to determine their meanings. However, there were 20 terms that no student knew, a few words that a few students knew, and just one word that all 112 students recognized. Maruyama has outlined the causes of students' low vocabulary levels: The students were unmotivated to learn the words since they were uncommon or seldom used in their everyday lives. Additionally, Due to their unfamiliarity with the scientific language, most English teachers could not teach these terms to their learners. Maruyama's analysis and the actual circumstances are pretty close. Many students also believe ESP concepts are not often used, particularly in everyday life; therefore, they lack the will to learn and recall them.

Learning Strategies

Adults must work harder than children in order to learn a new language, but the learning skills they bring to the task permit them to learn faster and more efficiently. The skills they have already developed in using their native languages will make learning English easier. Although you will be working with students whose English will probably be quite limited, the language learning abilities of the adult in the ESP classroom are potentially immense. Educated adults are continually learning new language behaviour in their native languages, since language learning continues naturally throughout our lives. They are constantly expanding vocabulary, becoming more fluent in their fields, and adjusting their linguistic behaviour to new situations or new roles. ESP students can exploit these innate competencies in learning English.

CONCLUSION

English for specific purposes as an approach, that is based on learner’s needs, and his expactations behind learning language**.** Needs assessment or need analysis in ESPshould not be considered as a different kind of teaching the language but rather asan approach as it is also based on the common belief of teaching language forcommunicative purposes. ESP is focusing on the specific needs of the learners,concentrating more on language in context. In the field of ELT (English LanguageTeaching), ESP is concerned with the specific English language needs of thetarget learners/students. It refers to teaching a specific genre of English forstudents with specific goals. The goal of ESP is oriented and focused on Englishteaching and learning, designed for the specific learners according to learners’academic and professional needs. ESP

course is developed based on anassessment of purposes and needs and the activities for which English is needed.However, in ESP it is a needs analysis that determines which language skills aremost needed by the learners, and the syllabus is designed accordingly.

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UNIVERSITY EXAMS PRESENT DANGER

Jakhongir Tursunov
Postgraduate, Linguistics and Literary Studies Department;
Assistant Teacher, Department of Practical Translation,
Uzbekistan State World Languages University
E-mail: jahongirtursunov45@gmail.com

ABSTRACT

The purpose of this theoretical article is to investigate the factors that make exams feel intimidating to university students rather than motivating them to study willingly. The goal of the research is to comprehend the causes of this occurrence and offer suggestions for how to deal with it. "A thorough evaluation of the prior research on the subject was undertaken for this study, with an emphasis on studies that looked at the connection between assessment and student motivation" (Crooks, 1988, p. 438). The focus on grades and rankings can foster a culture of rivalry that undermines the natural drive to study. One classic experiment conducted by Edward Deci and Richard Ryan in the 1970s, known as the "Candle Problem," demonstrated that external rewards (such as grades) can actually decrease intrinsic motivation for tasks that require creative problem-solving. Also, there is often a lack of feedback and support for students, especially those who struggle, which can further exacerbate feelings of inadequacy. In conclusion, the results of this study imply that in order to increase student motivation and involvement, evaluation procedures need to be reassessed and revised.

Keywords: Assessment problems; Lack of Clarity; Bias; Overemphasis on Grades; Assessment as a Threat; Mitigating the Threat of Assessment.

INTRODUCTION

Assessment is a critical component of higher education. It is the method by which teachers assess the knowledge and development of their pupils. When done correctly, assessment may give students insightful feedback, assist teachers in bettering their lessons, and guarantee that learners are achieving the learning goals of their courses. Unfortunately, evaluation isn't always done correctly, and it can even threaten pupils rather than encourage them to study. "Unfortunately, evaluation isn't always done correctly, and it can even threaten pupils rather than encourage them to study" (Black & William, 1998; Crooks, 1988; Harlen, 2006; Hattie & Timperley, 2007; Shepard, 2000; Wiggins,

2005; Wiggins, 1998). In this article, we will explore some of the most common problems of assessment in higher education as well as discuss why assessment can be a threat to students, and what can be done to mitigate this threat.

THEORETICAL FRAMEWORK

Assessment for Learning: This strategy places more emphasis on using evaluation to help and advance learning than just gauging results. When evaluation is employed largely for summative goals, it may produce a high-stakes climate that encourages anxiety and perceived threats among students.

LITERATURE REVIEW AND METHODOLOGY

This theoretical article seeks to investigate why evaluations appear to university students as a threat rather than as a motivation to study voluntarily. An extensive assessment of pertinent literature was done to reach this goal. The steps performed to choose and analyse the literature are described in the methodology that follows. Literature Search: A systematic search was performed using academic databases such as Google Scholar, JSTOR, and ERIC. The search was limited to articles published between 1988 and 2021 to ensure the inclusion of recent research. Selection Criteria: The initial search yielded a large number of articles. To narrow down the selection, the following criteria were applied:

a. Relevance: Articles that directly addressed the relationship between assessment and student motivation in the university context were included.

b. Peer-Reviewed: Only peer-reviewed articles were considered to ensure the quality and reliability of the sources.

c. English Language: Articles written in English were selected due to language proficiency limitations.

d. Publication Date: Preference was given to recent articles to incorporate the most up-to-date research findings.

Data Extraction and Analysis: Relevant information from the selected articles, including key arguments, theories, and empirical evidence, was extracted and organized. Thematic analysis was employed to identify common themes and patterns across the literature. Synthesis and Interpretation: The findings from the selected articles were synthesized and interpreted to develop a comprehensive understanding of the reasons why assessment may be perceived as a threat rather than an encouragement for university students. Integration Theoretical Frameworks: The theoretical frameworks proposed by scholars such as Black and William (1998), Crooks (1988), Harlen (2006),

Hattie and Timperley (7), Shepard (2000), Stiggins (2005), and Wiggins (1998) were integrated into the analysis to provide a theoretical foundation for the discussion. Citation and Referencing: Proper citation and referencing were ensured throughout the article following the guidelines of the chosen citation style (e.g., APA, MLA). The methodology described above guided the selection, analysis, and synthesis of the literature to explore the reasons why assessment seems like a threat rather than encouraging university students to study willingly. By drawing on a range of scholarly works, this article aims to contribute to the existing knowledge in the field and provide insights for educators and policymakers to create assessment practices that promote student motivation and engagement.

ANALYSIS AND DISCUSSION

Lack of Clarity

Lack of clarity is one of the main issues with assessment in higher education. There are numerous ways to do this. For instance, learning objectives, evaluation standards, or grading guidelines may all be ambiguous. When students are unsure of what is expected of them, they may find it difficult to adequately prepare for exams, which can result in subpar performance and poorer grades. According to Black and William (1998), one of the main issues with assessment in higher education is the lack of clarity. They argue that learning objectives, evaluation standards, or grading guidelines may all be ambiguous, making it difficult for students to adequately prepare for exams (p.7). Additionally, Crooks (1988) emphasizes the impact of classroom evaluation practices on students, suggesting that unclear expectations can lead to subpar performance and poorer grades (p. 438). Harlen (2006) discusses the relationship between assessment for formative and summative purposes, highlighting the importance of clear assessment criteria for effective learning outcomes (pp. -178).

Solution: To address this issue, instructors should work to present precise and thorough learning objectives, evaluation standards, and grading guidelines. Rubrics, checklists, and other tools that serve to define expectations and give pupils a clear path to success can be used to do this.

Bias

Bias is a different issue with assessment in higher education. Unconscious bias on the part of educators is one example of bias, as is systemic bias ingrained in assessment instruments and processes. Bias has the potential to reinforce existing educational inequities and result in unequal outcomes for pupils.

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systemic bias ingrained in assessment instruments and processes (Black & William, 1998; Crooks, 1988; Harlen, 2006; Shepard, 2000; Stiggins, 2005; Wiggins, 1998). Bias has the potential to reinforce existing educational inequities and result in unequal outcomes for pupils (Black & William, 1998; Hattie & Timperley, 2007; Shepard, 2000; Stiggins, 2005; Wiggins, 1998).

Solution: Educators should work to adopt unbiased and open assessment tools and techniques in order to combat prejudice in assessment. In order to lessen the effects of unconscious bias, this can be done by using blind grading. It can also be done by using a variety of assessment techniques to give a more complete picture of student performance.

Assessment as a Threat

Students may be threatened by assessments for a variety of reasons. The fact that evaluation is frequently linked to grades is one of the primary causes. Students may believe that their value as a student is based on their grades because they are viewed as a gauge of academic progress. Students may believe that their future depends on how well they perform on tests, which can cause anxiety and stress. Students may be threatened by assessments for a variety of reasons. The fact that evaluation is frequently linked to grades is one of the primary causes (Black & William, 1998; Crooks, 1988; Shepard,2000). Students may believe that their value as a student is based on their grades because they are viewed as a gauge of academic progress (Black & William, 1998; Harlen, 2006; Wiggins, 1998).

The ability to compare kids to one another is another way that assessment might endanger students. As a result, students may be more concerned with surpassing their peers than with actually learning and comprehending the material. This might cause pupils to prioritize memory and regurgitation of material over in-depth study, which can result in a superficial comprehension of the subject matter.

When assessments are utilized as high-stakes tools, pupils may also be at risk. High-stakes exams are ones with important outcomes for students, such graduation, job, or admittance to a university. Students may believe that their entire future depends on how well they succeed on an assessment when it is employed as a high-stakes tool. This could lead to pressure and tension, which could be bad for learning.

Reducing the Threat of Assessment

There are strategies to lessen the threat that evaluation poses to pupils. One strategy is to change the emphasis from grades to learning. This can be accomplished by using formative assessment, in which learners receive feedback on their progress during the course of learning as opposed to only at the conclusion of a course or task. Students are more likely to

engage in deep learning and grow a passion of learning if learning is prioritized over grades. "There are strategies to lessen the threat that evaluation poses to pupils. One strategy is to change the emphasis from grades learning. This can be accomplished by using formative assessment, in which learners receive feedback on their progress during the course of learning as opposed to only at the conclusion of a course or task. Students are more likely to engage in deep learning and grow a passion for learning if learning is prioritized over grades" (Black & William, 1998; Crooks, 1988; Harlen, 2006; Hie & Timperley, 2007; Shepard, 2000; Stiggins, 2005; Wiggins, 1998). Finally, when evaluation is used in a helpful and motivating context, kids may find it less intimidating. Teachers may foster a positive learning environment by giving students clear and helpful feedback, being accessible for questions and concerns, and fostering a culture in the classroom that prioritizes learning and growth over grades and competitiveness.

CONCLUSION

Assessment is an essential part of education, but it can also be a threat to students, instead of making them learn willingly. When assessment is associated with grades, used to compare students to one another, or used as a high-stakes tool, it can create anxiety, stress, and a superficial understanding of the subject matter. Assessment can, however, be a tool for fostering in-depth learning and a love of learning if the emphasis is shifted from grades to learning, a range of assessment techniques are used, growth and development are prioritized, and a supportive environment is created. Additionally, educators can develop a more equitable and efficient assessment system that promotes student learning and development by addressing problems like ambiguity, bias, and overemphasis on grades. It is our duty as educators to make sure that assessment is used to promote student learning and development rather than to intimidate or reprove them.

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ОЦЕНКА НАПРЯЖЕННОСТИ И УДАРООПАСНОСТИ ДЛЯ ПОДЗЕМНЫХ ГОРНЫХ ВЫРАБОТОК И НАБОР ДАННЫХ МЕТОДОМ АКУСТИЧЕСКОЙ ЭМИССИИ ПРИБОРОМ СБ-32

А. О. Чорикулов
Доцент кафедры кафедры «Горное дело» НавГГТУ

Б. Б. Ражабов
Магистр кафедры «Горное дело» НавГГТУ

Ф. М. Бердиев
Старший преподаватель «академический лицей» СамГУ

АННОТАЦИЯ

В статье расматривается вопросы прогноза категории опасности горных пород на основе оценки напряженного состояния массива в конкретных условиях и направлен на выявление участков горного массива золоторудного месторождения, опасных по напряженному состоянию массива пород, с целью заблаговременного принятия мер по их предотвращению. Обоснован метод акустической эмиссии прогноза и методология проведения замеров.

Ключевые слова: Горный массив, акустическая эмиссия, удароопасность, тектонические нарушения, напряжение, порода, шпур, прогноз, импульс, деформирования, амплитуда, трещиноватость, разупрочнением.

ВВЕДЕНИЕ

В мировой практики прогноз категории опасности по горним ударом и напряженному состоянию менсторожденые полезных ископаемых при разработки подземны способом является одним из приоритетных направлены. На основе оценки напряженного состояния массива в конкретных условиях и выявление участков, опасных по напряженному состоянию массива пород, принятия мер по их предотвращению, выбор места замера, подготовка места замера, мероприятия во время замера и расчет параметров процесса акустической эмиссии. Возникновения и распространения импульсных упругих колебаний (акустических волн), во время деформаций и напряжённого состояния массива в конкретных условиях направлен на выявление участков,

опасных по напряженному состоянию массива пород, с целью заблаговременного принятия мер по их предотвращению. является одним из основных задачи горного производства .

МАТЕРИАЛЫ И МЕТОДЫ

Для исследования принят прибор СБ-32М (САПФИР) каторая дает вазможност применения методы локального прогноза по параметрам акустической эмиссии, удароопасности шахтных полей и определения параметров главных напряжений в массиве горных пород.

Прогноз категории удароопасности горных пород производится на основе оценки напряженного состояния массива в конкретных условиях и направлен на выявление участков, опасных по горным ударам, с целью заблаговременного принятия мер по их предотвращению.

Акустическая эмиссия (АЭ) - явление возникновения и распространения импульсных упругих колебаний (акустических волн), во время деформаций и напряжённого состояния материала.

Принципиальная возможность определения категории напряженного состояния массива по параметрам АЭ заключается в тесной связи АЭ с процессом запредельного деформирования горных пород в горном массиве. Регистрация с помощью приборов импульсов, возникающих вследствие микро разрушений при достижении горной породой предела прочности, позволяет оценить уровень нагрузок и характер деформирования.

В первую очередь наличие импульсов АЭ свидетельствует о том, что нагрузки в массива горных пород превышают предельные. Активность процесса АЭ (N) - число событий в единицу времени, зависит от скорости необратимого деформирования пород. С ростом скорости деформирования пропорционально увеличивается активность АЭ. На удар опасных участков уровень активности АЭ имеет высокое значение. Однако высокий уровень активности АЭ наблюдается также и в не удар опасных условиях, например, в целиках небольших размеров. В отмеченных случаях необратимое деформирование горных пород может происходить с большой скоростью, но на уровне остаточной прочности, когда породы уже неспособны к накоплению больших запасов упругой энергии и разрушению в виде горного удара.

В связи с этим, по активности АЭ можно лишь судить о выполнении первого условия горного удара - о деформировании пород за пределом прочности. Высокая скорость необратимого деформирования является условием необходимым, но недостаточным для отнесения участка массива горных пород к опасным по

горным ударам. Бурный характер разрушения (горный удар) возможен в том случае, когда приток энергии из внешней среды (окружающих пород) превышает ее поглощение в области запредельного деформирования. Энергия и амплитуда импульсов АЭ, сопровождающих эти процессы, соответственно повышаются.

Иными словами, характеристикой неустойчивого состояния участка массива пород служит соотношение между импульсами АЭ различных энергетических классов - энергетическое или амплитудное распределение. С повышением удар опасности доля сильных импульсов АЭ увеличивается. Отражает отношение между импульсами АЭ различных энергетических классов показатель амплитудного распределения импульсов (Ь), величина которого является характеристикой неустойчивого состояния участка массива горных пород.

Выбор места замера для набора данных по параметрам акустической эмиссии. Для набора данных по параметрам акустической эмиссии замеры прибором СБ-32 производятся в выработках при шпуровой отбойке в интервале от 1 до 5 часов после взрывных работ. В бланке замера указывается точное время прошедшее после взрывных работ.

В первую очередь измерения следует проводить на участках с внешними признаками динамических проявлений горного давления (интенсивное заколобразование, шелушение, стреляные).

При отсутствии в шахтных выработках на момент исследований участков с внешними признаками замеры производят на участках выявленных техногенных и природных (геологических) концентраторов напряжений:
- тектонических нарушений; - контакты пород с различными физико-механическими свойствами; - при сбойке выработок, начиная с подхода к сбойке на расстояние 5ч-7 м; - при приближении одиночной выработки к очистным работам (то есть в зоне опорного давления от очистной выемки) начиная с расстояния в 10 м; - выработки в зоне влияния массового взрыва.

Для установки датчика обуревается шпуры диаметром в пределах 39-45 мм под небольшим углом к горизонту, чтобы вода вытекала с них и не оставалась в шпуре (5°-15°). Требуется избегать контакта прибора с водой, в том числе датчика и провода, убедится что провод не находится в воде, а датчик не промок в шпуре, в случае намокания датчика в шпуре необходима его полная просушка перед его повторным использованием.

Приконтурная часть выработки зачастую отслаивается (бутит), краевая часть массива характеризуется увеличенной

трещиноватостью, разупрочнением горных пород, это связано с влиянием буровзрывных работ и пригрузкой горного давления по контуру выработки. В зависимости от физико-механических свойств горных пород эта зона может достигать от 0,5 до 0,6 м. Датчик рекомендуется устанавливать на глубину от 0,7 до 1,5 метров, чтобы пересечь зону трещиноватости. Шпуры желательно располагать перпендикулярно стенки выработки. Если шпуры располагаются под углом к проходке выработки, то необходимо увеличить глубину установки датчика. На рис. 1 показаны шпуры длиной один (жирной линией) и полтора (пунктирной линией) метра.

У тектонического нарушения измерения следует проводить при приближении подготовительной или очистной выработки на расстояние 10, 7, 5, 3 м и при его пересечении. При этом наиболее высокая напряженность возникает в случае, когда выработка пересекает тектоническое нарушение под острым углом. Когда тектоническое нарушение попадает в зону очистной выемки, его влияние может распространяться на большие расстояния.

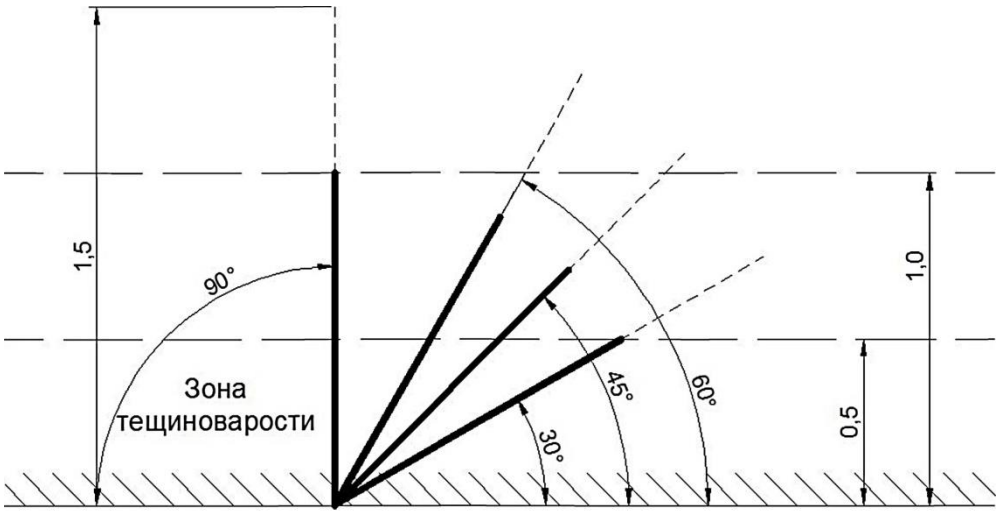

Рис 1. Схема расположения замерных шпуров длиной 1 и 1,5 м под углом относительно стенки выработки

Если на участке замера присутствует геологическая нерешённость (контакты пород, тектонические разломы, зеркала скольжения) необходимо закладывать шпуры в оба крыла относительно нарушения на расстоянии не менее метра от шва. Зону влияния контактов разно прочностных пород можно оценить по замерам АЭ при проходке выработки через этот контакт. Замеры рекомендуется проводить непосредственно у контакта в более прочной разновидности пород.

На активность процесса АЭ существенное влияние оказывают взрывные работы. Активность АЭ в момент взрывных работ резко возрастает. В дальнейшем происходит ее затухание по экспоненциальному закону. Поэтому измерения параметров АЭ проводится в интервале, начиная через 1 час и не позднее чем через 5 часов после взрывных работ в забое. Однако принятый интервал измерений необходимо подтвердить для условий конкретной шахты во время проведения исследований при возможности бурения замерных шпуров после взрывных работ рекомендуется их располагать в бортах выработки, либо в сопряжениях и по центру забоя рис. 2.

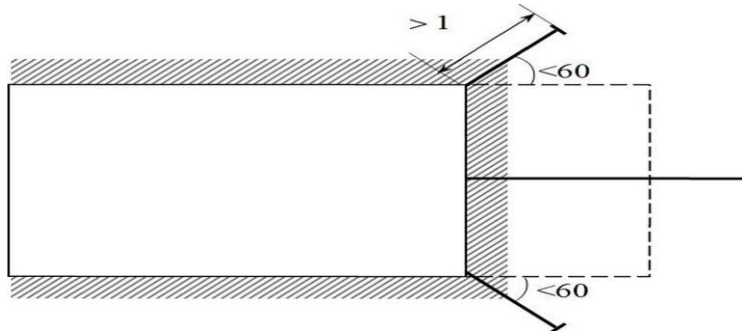

Рис. 2 Схема расположения замерных шпуров при бурении после взрывных работ

При отсутствии возможности бурения после взрывных работ измерительные шпуры пробуриваются совместно со шпурами забойного цикла паспорта БВР. В углы выработки направления бурения шпуров - под углом 60° и более к направлению подвигания забоя и по забою выработки, длина которого будет превышать цикл проходки на 0,7-1,5 м рис. 3.

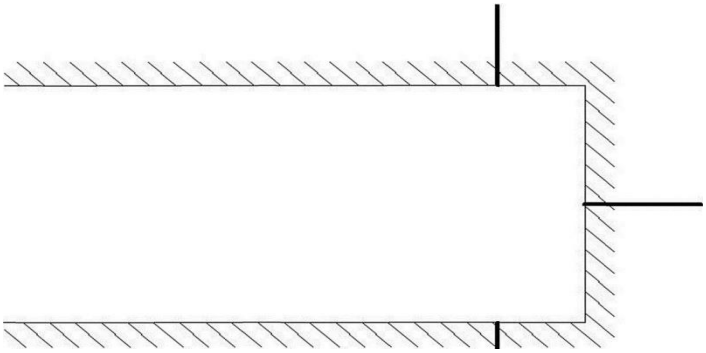

Рис. 3. Схема бурения замерных шпуров до проведения взрывных работ.

Алгоритм проведения замера. Перед началом замера удостовериться в безопасности места проведения замера (убраны заколы и нет отслоения стенок выработки в месте замера), необходимо отчистить шпур от шлама в целях предотвращения застревание датчика и его засорения.

Чтобы избежать поворота датчика в шпуре при установке следует изначально провернуть штангу на 1/2 полного оборота относительно крайнего положения при закручивании. Датчик с помощью штанги вводиться в шпур на глубину от 0,7 до 1,5 метров.

Плавным вращением штанги по часовой стрелке прижимаем пьезокерамический элемент датчика к стенке шпура. Проверяем качество установки датчика несильными толчками-выдергиваниями штанги. После установки датчика производят подсоединение кабеля и включение питания прибора.

После установки датчика проверяем качество акустического контакта с массивом. Путем возбуждения акустических импульсов, молотком по стенке выработки, последовательно на расстоянии 1, 2 и 3 м от датчика. При правильной установке датчика (хорошем акустическом контакте) прибор должен регистрировать импульсы от ударов по стенке выработки на расстоянии не менее 3 м, что свидетельствует о качественной установке датчика.

Если при расклинке датчика (выходе пьезокерамического элемента из корпуса датчика) хорошего контакта с массивом не достигнуто, следует ослабить пружину и произвести процедуру установки датчика в шпуре повторно, сместив датчик в шпуре на 2-3 см с прежнего места.

В случае разбитого шпура или шпура большего диаметра, когда хорошего контакта с массивом достичь не удаётся следует закрепить на датчике изготовленную специально для этого прибора - накладку. Чтобы датчик уверено «простукивался» на расстоянии не менее 3 м. Проверять качество установки датчика при каждом замере (на расстоянии 1, 2 и 3 м от установленного датчика) и замера расстояний для определения положения шпура в плане.

Мероприятия, проводимые во время замера. При соединении кабеля от датчика с прибором автоматически включается питание прибора. На дисплее высвечивается названия прибора "СБ - 32". При нажатии клавиши "ПУСК" прибор переходит в режим измерения. В процессе измерения на дисплее отображается содержимое амплитудных каналов и текущее время замера. Во время замера не задевать провод, идущий от прибора к датчику.

В процессе измерений оператор записывает в бланк замера показания количества импульсов в каналах через каждую минуту. Если в процессе замера происходят какие-либо внешние признаки динамических проявлений: откалывание закола от массива, щелчки, глубинные толчки - их следует отмечать в бланке (графа

примечание) с указанием времени проявления. Зарисовать схему расположения замерных шпуров и выработок, где производился замер, с привязкой к геологическому плану.

При проведении замера следует приостановить бурение, движение машин, шипение воздуха на буровых машинах, передвижения людей в выработке, кабель, идущий от датчика к прибору не задевать. Интервалы с помехами (отмеченные в примечании) исключают из расчетов. При завершении измерений производится выключение прибора отключением разъема датчика.

Расчет параметров процесса акустической эмиссии. Сигналы АЭ являются следствием процессов, происходящих при необратимом деформировании и разрушении горных пород. В связи с дискретностью и случайным характером этих процессов случайными являются и сигналы АЭ. Поэтому анализ АЭ - сигналов и определение основных параметров процесса АЭ проводят на основе теории случайных процессов и аппарата математической статистики.

К основным параметрам процесса АЭ относятся средняя активность (Na_1 - число импульсов за 15 секундный интервал) и показатель амплитудного распределения импульсов (Ь).

Для расчета параметров используются результаты замеров, высвечивающиеся на индикаторе прибора СБ-32:

- первым на индикаторе отображается количество импульсов (a_1 превышающих первый амплитудный уровень за весь период регистрации;
- вторым отображается количество импульсов (a_2) превышающих второй амплитудный уровень за весь период регистрации;
- третьим отображается продолжительность замера *(T)* в минутах.

Среднюю активность АЭ (Na_1) рассчитывают по следующей формуле:

$$Na_1 = \frac{a_1}{T*4} \quad \text{импульсов за 15 сек.} \qquad (1)$$

Продолжительность измерений (весь период регистрации Т) должна составлять 20 минут. Число 15-секундных интервалов при отсутствии помех 80

Показатель амплитудного распределения АЭ *(b)* рассчитывается по формуле:

$$b = \frac{a_1}{a_2} \qquad (2)$$

ЗАКЛЮЧЕНИЕ

Таким образом, категория напряженного состояния участка массива горных пород достаточно полно определяется двумя параметрами процесса естественной АЭ — активностью (N) и показателем амплитудного распределения импульсов (b) что дает возможности прогноза удароопасности шахтных полей и определения параметров главных напряжений в массиве горных пород.

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