

## THE IMPORTANCE OF USING THE SCIENTIFIC HERITAGE OF IBN SINA IN THE TEACHING OF BIOLOGY IN GENERAL SECONDARY EDUCATION

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### ABSTRACT

This article discusses the great contribution of the thinker Abu Ali ibn Sina to the development of science and his scientific legacy. It is also emphasized that the teachings on human qualities, which are the basis of education, are a methodological source of education. The author emphasizes the importance of passing on Avicenna's legacy to the younger generation and improving educational technologies in teaching biology in secondary schools. The purpose of the article is to reflect the analysis of scientific and theoretical sources for the use of the teachings of Abu Ali ibn Sina in the teaching of biology in general secondary schools. Therefore, the idea of creating ways to incorporate the teachings of a scientist into biology textbooks is reflected. Its object is the process of incorporating sources related to the teachings of Abu Ali ibn Sina into biology textbooks in the teaching of general secondary school students. The article presents ideas for developing teaching methods in general biology classes and creating new technologies for continuing education so that school pupils can develop knowledge about nature and human health. It is important to improve the science of biology for schoolchildren using the scientific heritage and teachings of a great scholar like Ibn Sina.

**Keywords:** Scientific heritage, Biology, Development, Spirituality, Doctrine.

### INTRODUCTION

Abu Ali ibn Sina is a great encyclopedic scientist who made a great contribution to the development of world science with his scientific works on medicine and philosophy, as well as logic, chemistry, physics, astronomy, mathematics, music, linguistics. As a pioneer in the field of medicine, a pioneer of medical science, a wise philosopher, a great mathematician, educator, psychologist, musician, a unique poet, he made a worthy contribution to the development of exactly 29 fields of science. Ibn Sina, who had a great influence on the development of enlightenment and culture in the East and Europe, in his time was awarded such high positions as "Sheikh ur-Rais", "Chief of Scholars", "King of Physicians".

Speaking at the international conference "Historical heritage of medieval Eastern scholars and thinkers, its role and importance in the development of modern civilization" in Samarkand in May 2014, I.A. Karimov spoke about our great ancestors, the most famous philosopher and encyclopedic scholar of the Islamic world and the greatest of mankind. The life and work of Abu Ali ibn Sina, who was awarded the title of "one of the thinkers", should arouse a special feeling of pride and respect in the generations, "We should be proud of our great ancestors. At the same time, it is not enough to be proud, let's contribute to this priceless heritage like them!" he stressed.

According to Ibn Sina, he was so versatile that he influenced the writing of Dante's most famous work, the Divine Comedy, by the Italian statesman and poet Dante. The fact that a strong scholar memorized the Holy Qur'an at the age of 10 is an exemplary school of life for today's young generation. Ibn Sina, a great representative of the development of religious and secular sciences, argues that true moral qualities and an ideal society can be achieved in this present world, for which people in society must live by helping each other, a seemingly simple rule. And these ideas are extremely important today for the states that are working for peace and prosperity of the people. In addition, in his works on morality, he emphasizes the need to pay special attention to the most important moral relations in people's daily lives, such as humility, dignity, courage, honesty, integrity. The teachings on these human qualities, which are the basis of education, are currently a methodological source for the introduction of "Science of Education" in the general education system of the country (Aliqulova M.M. 2010).

## **METHODOLOGY**

In the theoretical enrichment of the biological sciences, it is expedient to use the teachings written by the scientist. It is also worth noting the main hygienic factors of adherence to the rules of a healthy lifestyle. Theoretical knowledge of hygiene is passed in the process of teaching biology in secondary schools. In particular, § 24 of Chapter IV, entitled "General biological laws of life at the level of the organism. "In improving the content of the topic "Genetics and human health", the scientist created the issues of the impact of the external environment on the human body, human health, diet, personal hygiene.

The Laws of Medicine covers the knowledge of hygiene, the requirements for human life and health, not only in terms of cleanliness, but also to ensure that their lives are beautiful, comfortable and safe. The hygienic basis of human health, that is, the physical health of a person, the creation of a strong shield against various dangerous diseases, is determined, first of all, by strict adherence to the rules of personal hygiene, and secondly, the provision of hygienic living conditions. Is also inextricably linked to living in compliance with the requirements of public hygiene.

One of the important tasks is the formation of a healthy lifestyle hygiene in adolescents, the identification of specific opportunities to follow the rules of hygiene that maintain and strengthen health, and the content of the factors that make up a healthy lifestyle is hygienic education. Hygienic education is the provision of highly productive work and healthy living conditions for the normal development of the organism, protection against infectious diseases, cleanliness of public places and living environment, adherence to the agenda, adherence to a diet.

§37 of Chapter IV of the Grade 10 Biology textbook of general secondary education entitled "General Biological Laws of Life at the Species and Population Levels". Another idea that can be effectively incorporated into the context of the "emergence of evolutionary ideas" is Abu Ali ibn Sina's regular pollution of water, land and air, the lack of cleanliness of human habitats, various infectious diseases (leprosy, smallpox, plague, purulent rashes, etc.). Is the idea that it creates favorable conditions for rapid spread.

Introducing students to the recommendations of Abu Ali ibn Sina on the effective and continuous organization of youth education will help them to develop physical activity, physical education skills and grow to maturity in all respects. The thinker emphasizes that physical education should be conducted in different ways, taking into account a person's age, health and disease status. Especially in childhood, adolescence, youth and old age, a person should have

a different approach to physical activity. Abu Ali ibn Sina emphasizes that “exercise is a voluntary action that forces a person to take deep breaths in a row, ”noting that a person who engages in regular physical activity does not feel pain and does not feel the need for a doctor or medication.

The scientist emphasizes the need to pay special attention to the following three factors in the process of physical education by children:

- 1.Skin color - if it improves, you can continue exercising, if you start sweating,you should stop the movement.
- 2.Lightness of exercise - it is possible to continue the exercise while the body is light during exercise.
- 3.To the condition of the limbs - if most of them continue, the exercise can be continued, if the indicated symptoms disappear, the exercise should be stopped immediately. (Figure1).

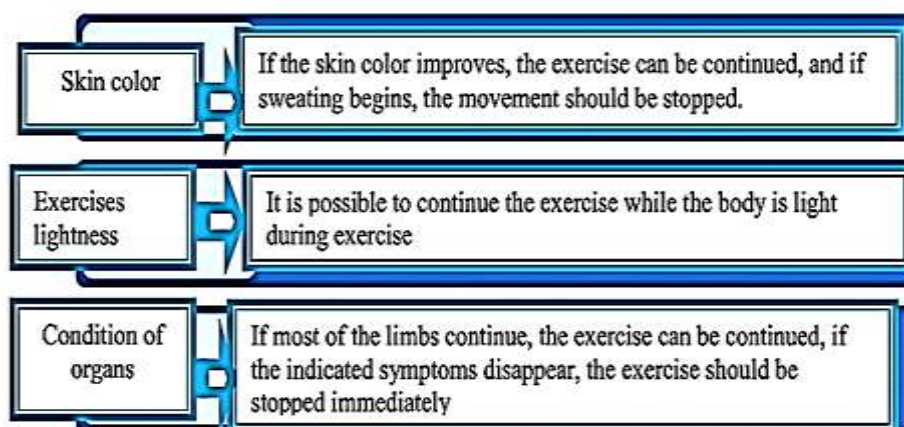


Figure 1. In the process of engaging in physical education the importance of body condition

Abu Ali ibn Sina also showed various forms of physical education and how to use them in strengthening human health. The scientist divides physical training exercises into the following groups: "Small and large, very strong and weak, fast and slow or consisting of fast and intense movements or slow type". The scholar also described the times when it was convenient for children to engage in physical education. For example, it is convenient for physical training in the spring,when it is convenient to exercise at home at a moderate temperature, in the morning in summer and in the evening in winter. According to the thinker, the following conditions should be observed when engaging in physical education: heating the house at a moderate temperature in winter, it is medically correct to perform exercises after digestion.

§12 of Chapter IV of the textbook of biological sciences "General biological laws of life at the level of the organism. "It is recommended that the lesson on "The level of the organism and its peculiarities of life" be organized as follows.A conversation on the topic of the lesson is organized, in which the teacher uses visual aids to provide students with information about the respiratory organs,lungs and its functions. The course focuses on the use of the views of Central Asian scientists on the effects of the external environment on the human body and the protection of human health.In particular, Abu Ali ibn Sina was the first to scientifically describe the harmful properties of coal gas: (Figure-2)

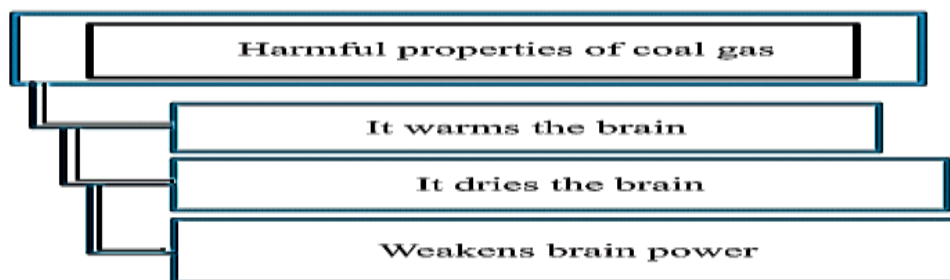


Figure 2. Ascientific description of the harmful properties of coal gas given by Abu Ali ibn Sina

It should be noted that the air contains dust and various microbes at all times. Exposure to dusty air has a negative impact on human health, resulting in various infectious diseases. The use of Ibn Sina's scientific views on nature conservation is also of practical importance to students.

People have long thought about preserving nature. If the ancestors were indifferent to the preservation of nature, nature would not be in its present state. Today, air, water, and soil are becoming increasingly polluted. Some plants and factories pollute the air with dust and toxic fumes, and harmful substances fall into water bodies and soil. If nature is covered with dust and smoke, if natural resources are destroyed for human needs, the animal world will not multiply, the plants will not grow.

Nowadays, plants are often uprooted from the fields, and animals are increasingly hunted for fur and meat. In the past, tulips, cloves, mountain goats, snakes and small drills were common in the country, but today their number has sharply decreased. Such negative appearances disrupt the harmony in the lives of plants, animals and people.

In the process of studying the material in the textbook on the subject of biological sciences § 41. In improving the content of the paragraph "Human use of relationships between organisms" on "The struggle for survival and its types", it is desirable to integrate legal knowledge into the solution of problems that may occur in the health of students on the basis of integrated methods. In particular, Article 40 of the Constitution of the Republic of Uzbekistan states that every citizen has the right to access medical services.

Another effective way to protect the health of students is to emphasize the need to avoid various harmful habits (for example, not to consume alcohol and drugs, not to smoke tobacco products). Special emphasis is placed on the fact that harmful habits cause various diseases in the human body.

## RESULTS

In recent years, extensive work has been done to restore our national values, study and promote the rich scientific and spiritual heritage left by our great ancestors. They are:

In-depth study and wide dissemination of the rich heritage of Abu Ali ibn Sina, a doctor, scientist and philosopher who made a great contribution to world medicine, in particular, educating our compatriots, especially young people, on the basis of his spiritual and enlightenment heritage, informing foreigners about this universal heritage. In order to implement and actively participate in the reform of the health care system: Ibn Sina Public Foundation was established by the Decree of the President of the Republic of Uzbekistan dated June 1, 1999 No. PF-2171 on the support of the Ibn Sina International Foundation.

The inaugural meeting of the Board of the International Prize named after Ibn Sina was held at the French National Academy of Medicine. The main purpose of establishing the International Prize named after Ibn Sina is to study the scientific heritage of Abu Ali Ibn Sina and its globalization, as well as the exchange of scientific experience and the establishment of dialogue between cultures and developments. It should be noted that the International Prize named after Ibn Sina is awarded to prominent public figures, medical experts and specialists who have contributed to the study and dissemination of the scientific heritage and human views of the thinker.

On November 20-21, 2015, on the occasion of the 1035th anniversary of the birth of Abu Ali Ibn Sino, the VIII International Scientific and Practical Conference "Medical Legacy of Ibn Sina and the Problems of Modern Medicine" will be held in Bukhara. Within the framework of this event, for the first time, the presentation ceremony of the International Prize named after Ibn Sina took place.

A bronze statue of Ibn Sina was erected in Bukhara. This unique work of art is the work of a talented young sculptor from Khorezm Jasvand Annazarov. A world-renowned scientist named Avicenna has erected a magnificent statue of the founder of medical science in Austria, Belgium, Turkey, Iran, Turkmenistan, Tajikistan and other countries, including Rue Malmezon, near the French capital Paris.

The memorial-museum named after the great scientist in the village of Afshona has acquired a new look during the years of independence. It was reconstructed in 2006. The memorial-museum consists of seven sections, which reflect the childhood and adolescence of Abu Ali ibn Sina, the directions of his activity, the priority and harmony between his medical heritage and Oriental medicine, and contain extensive information about the great ruler's contemporaries, contemporaries and followers. There are more than five hundred exhibits in the exhibition halls today. The activities of the International Ibn Sina Public Foundation play an important role in the in-depth study and promotion of the legacy of the encyclopedic scholar. The Foundation has been effectively cooperating with centers and foundations abroad to study the heritage of our ancestors. In 2000, the French donated a facsimile of several pages of the Laws of Medicine kept in Paris to the Memorial Museum in Afshana.

The memorial museum named after Abu Ali ibn Sina is always crowded. Especially when foreign tourists and visitors get acquainted with the museum, they write down their impressions and opinions. In particular, "I felt some kind of divine glory in the Ibn Sina Museum," writes the American tourist Edward Machirovsky. "Such figures, who have left a bright mark in the history of mankind, will always be equally glorious for all times and places, and will always amaze people," he said. To understand Ibn Sina, to feel the sanctity of his homeland, it is necessary to be in Afshana, to come to his museum.

In Uzbekistan, special attention is paid to the radical reform of general secondary education, the study of students on the basis of international assessment programs, the development of natural science literacy. It is especially important for students to organize their activities independently, to make a conscious attitude to reality on the basis of self-analysis. The Action Strategy developed in the country identifies the issues of "educating young people who are physically healthy, mentally and intellectually developed, independent-minded, loyal to the Fatherland, with a strong outlook on life" as one of the priorities.

## DISCUSSION

Ibn Sina was also very much engaged in research in botany, as most of the medicinal substances used in medicine are derived from plants. He writes about the types of plants, their origin, nutrition, plant organs and their functions, reproduction and growth conditions in the "Annabot" ("Plants") section of the Book of Healing, and has also worked on the development of scientific terminology (Abu Ali ibn Sino. 1996). The "Laws of Medicine" include the causes of diseases, healthy lifestyles, simple drugs and their effects, brain, internal and musculoskeletal organs, glandular conditions, causes of severe disease, infectious diseases, tumors, inflammation, joint and bone pain, types of drugs and their preparation, healing properties are described in detail.

At the same time, the richness of the flora of our country, the abundance of various herbs and medicinal plants in the forests, mountain slopes and deserts are noted. The fact that Abu Ali ibn Sina identified medicinal properties among such plants is evidence that he contributed to the development of biological science. In these textbooks, on the recommendation of our ancestor, the teachings of angishvana flower, namatak, walnut shell, which contains iodine, are of special importance (Aliqulova M.M. 2010).

It is important to pay attention to food hygiene in preventing the occurrence of such diseases. In the stomach, mixed foods are digested for an average of 4 hours. Therefore, it is necessary to eat every 4 hours. If the time between meals is less than 4 hours, the nutrients will not have time to pass from the stomach to the duodenum. As a result, new food is mixed with old food, the normal functioning of the stomach is disrupted and the abdomen relaxes. Conversely, if the time between meals is more than 4 hours, the stomach is emptied of enzymes produced by its glands and hydrochloric acid acts on the gastric mucosa, causing it to become inflamed. Chronic gastritis and ulceration of the stomach can occur if eating disorders are recurrent.

It is advisable for everyone to follow the following basic rules in order to prevent the risk factors arising from unbalanced diet in terms of content and energy value:

1. Limit eating, increase energy expenditure when overweight and at the same time reduce the consumption of high-calorie foods;
2. To cover the demand for carbohydrates up to 48% of total energy consumption by increasing the consumption of complex carbohydrates and "natural" sugars (fructose and lactose in fruits);
3. Reduction of production of refined sugar by 10%;
4. Reduce the consumption of fats by up to 30% of the total energy value required, to limit the consumption of meat, eggs and increase the consumption of skim milk;
5. 10% reduction in the consumption of saturated fats in the total energy value; reduce cholesterol intake to 300mg per day, reduce salt intake to 5g per day.

Ibn Sina based his existence on all things, their origin, order, interrelationship, necessity, possibility, reality, for a comprehensive examination of their transition from one to another. According to him, first the mountains came into being, then man came into being as a result of plant, animal and development. Man differs from all other animals by his words, language, and mind.

Deep knowledge of real events, science is unique to man. Ibn Sina, in his *Risalatun fi Tahal al-Varzadat*, divides the whole being into components, enumerates them one by one, and describes them. Categories such as being obligatory, being possible, substance, accident, matter, form, mind, element, body, power, perception, mineral, animal, speech, language are briefly described in this pamphlet.

Human knowledge is created through the knowledge of things. Cognition consists of emotional cognition and thinking through concepts. "Perception," he wrote, "is an effect that arises not in the external things themselves, but in our senses. Since the senses are the mirror of the material image and are expressed together with the height and width of the material forms, man cannot perceive them without material basis and cannot know the bodies. The human mind develops through the study of various sciences.

It should be noted that maintaining, improving one's health and practicing healthy lifestyle skills are also related to the "development of the human mind". The mind is interpreted as a criterion of any knowledge and practical activity. "Any knowledge that is not weighed on the scales of (intellect)", writes Ibn Sina, "cannot be true, so it is not true knowledge." hence, unless a consciously healthy lifestyle is followed, all health interventions will remain ineffective.

How is the level of health determined? Currently, the criteria that form the basis for health assessment are divided into the following groups:

1. Level of physical harmonic development.
2. Basic functional systems and reserve capacity of the whole organism.
3. The level of immune protection and nonspecific resistance of the organism.
4. Chronic and congenital diseases, the presence of developmental defects.

To strengthen health, everyone should know the structure of their body, the functioning of the organs. Only then will they consciously approach responsible work such as health care. But there are many among them who forget that their health is in their own hands. Not everyone can live a long life without diseases by choosing the path of health. This life squanders its sweet life without even halfway through the so-called path. Someone lives a long and happy life. However, the structure of the whole organism does not differ sharply from each other. The only difference is that in their attitude to health, someone maintains their health, lives a long life, and another lives a light life, shortening their life.

In the works of Ibn Sina, which represent the philosophical system ("Kitabush-shifo", "Kitab un-najot", "Donishnoma"), philosophical knowledge is given in the order of logic, physics, mathematics, metaphysics. Of these, logic is interpreted as a method of cognition, a scientific study of being, a scientific way of thinking about it. "Logic," writes Ibn Sina, "gives man a rule by which man avoids making mistakes in drawing conclusions."

With the help of logic, man separates true knowledge from falsehood and learns the unknown. He pays great attention to the study of the science of logic, devoting special treatises to it. In particular, he made a great contribution to the study of logical methods, description, judgment, inference, proof, Ibn Sina as a science of natural and social phenomena in his work "Aqşam ul-ulum ul-aqliya" ("Classification of mental knowledge") enumerated and described. Therefore, the essence of the work "Classification of mental knowledge" - the right thinking, the key to a healthy life free from disease. The sooner each disease is diagnosed, the easier it will be to treat it. To do this, every juvenile must undergo regular medical examinations. The only way to stay healthy is to make a healthy lifestyle an integral part of our lives. To do this, each student must follow the rules of personal and general hygiene, form a proper agenda, engage in physical education, give up harmful habits, eat properly.

## CONCLUSION

Improving the teaching of biology requires the use of the teachings of the thinker Ibn Sina and the choice of teaching methods in it, the ability to apply them in the teaching process. It is necessary to teach high school students in general secondary schools using the teachings of Ibn Sina in the biological sciences and to be able to identify, analyze a wide range of problems based on them, to feel what can be achieved in the future, to imagine.

To do this, it requires theoretical enrichment of the culture of the peoples of Central Asia on the basis of the teachings of the great thinker Abu Ali ibn Sino, who brought the culture of the peoples of Central Asia to the forefront of world culture in the Middle Ages.

The implementation of these tasks requires the improvement of pedagogical technologies for the use of the teachings of Ibn Sina in the teaching of biology, taking into account the basics of universal values and national culture in students.

Also:

Analysis of theoretical aspects of improving the pedagogical technology of using the teachings of Abu Ali ibn Sina in the biological sciences, based on scientific sources;

1. Scientific substantiation of the process of effective use of integration methods and tools used in the improvement of pedagogical technologies of using the teachings of Abu Ali ibn Sina in biology lessons.
2. To study the possibilities of absorbing the teachings of thinkers on the basis of advanced technologies in the teaching of biology and their application in the educational process.
3. Identify innovative methods and tools for improving the pedagogical technology of using the teachings of Abu Ali ibn Sina in biology lessons.
4. Recommendations aimed at improving the pedagogical technologies of using the teachings of the thinker in biology lessons, as well as the preparation of conclusions.

In short, in order to preserve our values, traditions, history, great spiritual and material, cultural heritage, it is important to educate schoolchildren in biology classes using the scientific heritage and teachings of a great scholar like Ibn Sina. According to the study, it is advisable to promote the teachings of Ibn Sina among schoolchildren, to hold various evenings and events to create recommendations that affect the spiritual development of adolescents. Implementing the analytical results of such research will help improve education.

Organize in-depth study of the creative heritage of Abu Ali ibn Sina, participate in the development of curricula for schools and universities, assist in organizing and publishing the works of great scholars, open the library of Ibn Sina.

To promote a healthy lifestyle based on the works of great scientists, to publish books, pamphlets, magazines, to open permanent programs on television and radio, to establish the Ibn Sina Museum.

To assist in the research of Ibn Sina's medical and scientific-spiritual heritage, to study his schools of science, in particular, to encourage and coordinate the scientific work of scholars in this field.

## RECOMMENDATIONS

One of the main goals in the period of development of a democratic state governed by the rule



of law and civil society is to bring up a healthy, educated, spiritually, morally pure, free, at the same time sense of civic responsibility, harmoniously developed generation. At present, social, economic and cultural ties between the countries are harmonizing with the processes of globalization. In modernizing society, educating students as a harmoniously developed generation, protecting them from the negative currents of globalization imposes important educational tasks on schools, family members, community members and activists of other non-governmental organizations. At the same time, the widespread use of pedagogical technologies plays an important role in improving school education, especially in the teaching of high school students. It should be noted that one of the most pressing issues in the teaching of science is to improve the content of education on the basis of educational values.

The role of the education and upbringing system, public organizations is important in the development of knowledge of students on the basis of the Uzbek national spirituality, educational values, ensuring accurate and complete education. It is necessary to convey to students all the opportunities created in our country for the development of the younger generation, including through the created educational tools.

For the current stage of development of society is characteristic of the process of qualitative improvement of all growth factors. It also allows for the effective and quality organization of the educational process based on the improvement of pedagogical technologies of incorporating the teachings of Abu Ali ibn Sina into the content of teaching biology. Improving the content of education in terms of high scientific methodology and teaching technologies is an important result.

The course emphasizes the invaluable practical importance of the teachings of Abu Ali ibn Sina in the development of education, including biology. In improving the content of biology lessons in secondary schools, it is expedient to refer to the works of Ibn Sina on a regular basis.

First: Biology lessons are based on an integrated (humanities, geography, biology) approach to conveying students' views on nature and human health.

Secondly, in the process of imparting knowledge of biology to students, in our country at a new stage of development (including the example of the region where the student lives), it is expedient to give examples of nature conservation, flora and fauna conservation and its importance for human health.

Third, in biology classes, showing students copies of Ibn Sina's works, using visual aids, posters, textbooks and documentaries on the scholar's work will increase students' interest in biology.

Fourth, the world wide popularity of Ibn Sina's Laws of Medicine, which is used as a textbook in the world's leading universities, strengthens students' sense of patriotism and pride, and encourages them to pursue science in the future.

Fifth, the explanation based on the ideas of the great thinker Abu Ali ibn Sina that human health, which is important for the student, is one of the main factors that ensure his activity in socio-economic life, increases their interest in biology and improves students' mastery of science.

## REFERENCES

- Ўзбекистон Республикаси Президентининг ПФ–4947-сонли «2017-2021 йилларда Ўзбекистонни ривожлантириш бўйича Ҳаракатлар стратегияси тўғрисида»ги Фармони // Ўзбекистон Республикаси Қонун ҳужжатлари тўплами. 2017 й..6-сон, 70-модда.
- Decree of the President of the Republic of Uzbekistan on support of the Ibn Sina International Fund. (January 6, 1999). Tashkent: (No. PF-2171).
- Abu Ali ibn Sino. (1996). *Laws of Medicine* (542 p). Compilers: U.Karimov, H.Khikmatullaev. Tashkent: Abu Ali ibn Sino Medical Publishing House.
- Aliqulova M.M. (2010). *Formation of Ecological Culture in Future Teachers*. Monograph (117 p). Tashkent: "Fan" publishing house.
- Aliqulova M.M. (2014) Regulation of ecological stability in the conditions of a civil society. *The Advanced Science Journal*, 8, 111-114.
- Aliqulova M.M. (2016) Ecological Culture as an Important Factor in Regional Sustainable Development. *European Journal of Research and Reflection in Educational Sciences*. 4№1, 23-29.
- Khairullaev M. (1971). *Renaissance and Eastern Thinker* (271 p). Tashkent: "Uzbekistan".
- Tojiboeva S.X. (2019) Methods Using Great Thinkers' Teachings about Nature and Human Health at Biology Lessons. *Eastern European Scientific Journal*. 01, 379-384.
- Biologiya (2017) Umumiy o'rtta ta'lim maktablarining 10-sinfi uchun darslik: 1-nashr /Mualliflar: A.G'afurov, A.Abdukarimov, J.Tolipova va.b. Тошкент: Sharq,
- Тожибоева С.Х. (2018) Биология дарсларида Абу Али ибн Синонинг табиат ва инсон саломатлигига оид қарашларидан фойдаланиш усуллари. *Замонавий Таълим илмий-амалий оммабон журнал*. 12, 42-48.
- Ўзбекистон Республикаси Конституцияси. (2016) Тошкент: Адолат.
- Болтаев М.Н. (2002) *Абу Али ибн Сина великий мыслитель, учёный-энциклопедист средневекового Востока*. Москва.