ПЕДАГОГИКАЛЫҚ ҒЫЛЫМДАР / ПЕДАГОГИЧЕСКИЕ НАУКИ / PEDAGOGICAL SCIENCES

КВАНТТЫ ОҚУ МӘТІНДЕРІН ӘЗІРЛЕУДІҢ ӘДІСТЕМЕЛІК АСПЕКТІЛЕРІ ЖӘНЕ "ХИМИЯЛЫҚ ЭКОЛОГИЯ" ПӘНІН ҚАШЫҚТЫҚТАН ОҚЫТУ ҮДЕРІСІНЕ ЕНГІЗУ

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Аннотация

Бүгінгі күні короновирустық инфекцияның таралуына және қашықтықтан оқыту форматына көшуге байланысты оқытушыдан білім алушыға тиімді ақпаратты берудің өзекті проблемасы туындайды. Сабақты дәстүрлі түрде өткізу мүмкін болмаған жағдайда, студенттердің оқу материалын дұрыс жеткізуі, қабылдауы және меңгеруі үшін барлық құралдар мен әдістерді қолдану қажет.

Берілген мәселені шешуде оқу мәтіндерін кванттау әдісін қолдануға негізделген білім беру технологиясы айтарлықтай көмек көрсете алады. Бұл мақалада біз профессор В.С. Аванесовтың "Химиялық экология"пәнін қашықтықтан оқыту контекстінде кванттық оқу мәтіндерін құру үшін ұсынған негізгі идеялары мен принциптерін көрсетуге тырыстық. Біздің ойымызша, сандық оқу мәтіндері дұрыс құрастырылған жағдайда ғана қажетті материалды зерттеуге мүмкіндік туғызады. Ақпарат мөлшерленген көлемде қамтылған, мұқият ойластырылған мәтіндерді ғана пайдалану керек. Осылайша, оқушы уақытты екінші материалға жұмсамайды, тек басты нәрсеге назар аударады. Бұл ретте ақпаратты қабылдау мен ассимиляциялау процесін жақсартады.

Пандемия аяқталғаннан кейін және дәстүрлі білім беру формасына қайта оралғаннан кейін, квантталған мәтіндер студенттердің өздік жұмыстары үшін де, мысалы, анықтамалық жазбалар үшін де өзекті және тиімді болады. Оқу мәтіндерін кванттау технологиясы нақты және қолданбалы барлық пәндерге қатысты өзекті болып табылады. Біз эксперимент ретінде теориялық және практикалық материалдардың үлкен көлемін біріктіретін «Химиялық экология» пәнін таңдадық.

Кілт сөздер: Covid-19, қашықтықтан оқыту, онлайн және оффлайн технологиялар, оқу мәтіні, кванттау, квантталған білім беру мәтіні, В.С. Аванесов, химиялық экология

МЕТОДИЧЕСКИЕ АСПЕКТЫ РАЗРАБОТКИ КВАНТОВАННЫХ УЧЕБНЫХ ТЕКСТОВ И ВНЕДРЕНИЕ В ПРОЦЕСС ДИСТАНЦИОННОГО ПРЕПОДАВАНИЯ ДИСЦИПЛИНЫ «ХИМИЧЕСКАЯ ЭКОЛОГИЯ»

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Аннотация

На сегодняшний день, в связи с распространением короновирусной инфекции и переходом на дистанционный формат обучения, возникает актуальная проблема

эффективной передачи информации от обучающего к обучающемуся. В условиях, когда невозможно провести занятие в традиционной форме, необходимым является использование всех средств и методов для успешной передачи, восприятия и усвоения учебного материала студентами.

Значительную помощь в решении данной проблемы может оказать образовательная технология, основывающаяся на использовании метода квантования учебных текстов. В данной статье мы попытались отразить основные идеи и принципы, предложенные профессором В.С. Аванесовым для создания квантованных учебных текстов в контексте дистанционного преподавания дисциплины «Химическая экология». На наш взгляд квантованные учебные тексты дают возможность изучать только необходимый материал, при условии их правильного составления. Следует использовать только тщательно проработанные тексты, в которых информация содержится в дозированных объемах. Тем самым ученик не тратит время на второстепенный материал, концентрируясь только на главном. При этом улучшается процесс восприятия и усвоения информации.

Однозначно, после завершения пандемии, и возвращение к традиционной форме обучения, квантованные тексты также будут актуальными и эффективными для самостоятельной работы студентов, например в качестве опорных конспектов. Технология квантования учебных текстов актуальна по отношению ко всем дисциплинам, как точных, так и прикладных. Нами в качестве эксперимента была выбрана дисциплина «Химическая экология», сочетающая в себе большое количество теоретического и практического материала.

Ключевые слова: Ковид-19, дистанционное обучение, онлайн и офлайн технологии, учебный текст, квантование, квантованный учебный текст, В.С. Аванесов, химическая экология.

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METHODOLOGICAL FOUNDATIONS OF THE FORMATION OF QUANTIZED EDUCATIONAL TEXTS AND THEIR USE IN TEACHING THE DISCIPLINE "CHEMICAL ECOLOGY" IN THE CONTEXT OF DISTANCE LEARNING

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Abstract

Today, in connection with the spread of coronavirus infection and the transition to a distance learning format, there is an actual problem of effective transfer of information from teacher to student. In conditions where it is impossible to conduct a lesson in a traditional form, it is necessary to use all means and methods for the successful transmission, perception and assimilation of educational material by students.

An educational technology based on the use of the method of quantizing educational texts can provide significant assistance in solving this problem. In this article, we tried to reflect the main ideas and principles proposed by professor V.S. Avanesov for the creation of quantized educational texts in the context of distance teaching of the discipline "Chemical Ecology". In our opinion, quantized educational texts make it possible to study only the necessary material, subject to their correct composition. You should use only carefully worked out texts in which information is contained in metered volumes. Thus, the

student does not waste time on secondary material, concentrating only on the main thing. This improves the process of perception and assimilation of information.

Definitely, after the end of the pandemic, and the return to the traditional form of education, quantized texts will also be relevant and effective for independent work of students, for example, as lecture notes. The technology of quantizing educational texts is relevant in relation to all disciplines, both exact and applied. We have chosen as an experiment the discipline "Chemical ecology", which combines a large amount of theoretical and practical material.

Keywords: COVID-19, distance learning, online and offline technology, educational text, quantization, quantum educational text, V. S. Avanesov, chemical ecology.

Introduction

In the current circumstances, when the coronavirus infection COVID-19 is spreading rapidly in our country and the world, the way of life of many people has changed, affecting all spheres of human activity. in the current circumstances, when the coronavirus infection COVID-19 is spreading rapidly in our country and the world, the way of life of many people has changed, affecting all spheres of human activity. This was one of the first to affect the education system of the Republic of Kazakhstan. In order to prevent the spread of coronavirus infection, the Ministry of Education and Science of the Republic of Kazakhstan decided to completely switch to the distance learning format.

«Everyone should understand that the transition to distance learning is taking place due to the limitations associated with the spread of coronavirus infection. Unfortunately, there is no other choice. The educational process should not stop» - Askhat Aimagambetov minister of education and science [1].

In conditions when it is impossible to carry out a full educational process in full form, it is distance learning that has become a kind of salvation for the education system.

Main part

Distance learning is a method of organizing the learning process based on the use of modern information and telecommunications technologies that allow learning at a distance without direct contact between the teacher and the student [2]. In the case of distance learning, classes are conducted through the Internet computer network, and using online and offline technology. For the successful implementation of distance learning today, there are a large number of various kinds of video conferencing programs - ZOOM, Google meet, Skype; learning platforms Moodle, Google Classroom, iSpringOnline and others, and many universities have developed regional programs for the continuous interaction of the student teacher [3].

With a full transition to a distance learning format, university teachers have a question: «How to conduct a lesson»? First, to make it interesting, since the student is on the other side of the screen, after 10 minutes of your broadcast of the topic, it may simply cease to interest him. Secondly, although the duration of the online lesson is the same as that of the traditional form, the teacher may not have time to share all the prepared material. And thirdly, with regard to the content of the lesson, the mistakes of many teachers are that when conducting an online lesson they give too much information, which is difficult for the student to perceive.

After analyzing this problem, we proposed ideas reflected in the technology of quantizing educational texts. In our opinion, this technology is the most effective form of providing theoretical material in the format of distance learning. The technology of quantizing educational texts was proposed by professor V. Avanesov. is based on the

reconstruction of educational texts by dividing it into parts called quanta. In addition to dividing the text into parts, the text is edited so that it becomes more understandable for students. According to this technique, it is necessary to use headings and subheadings, which visually helps the student to highlight important points in the text. In this case, headings and subheadings are selected in such a way as to express the meaning of each part of the text. The main goal of the theory of text quantization is to make educational texts more accessible for understanding, interesting and short in length.

Professor V. Avanesov offers the following order of presentation of an educational material in the form of a quantum text:

1. Split all text into parts and give subheadings for each part.
2. Break down the whole text into paragraphs on the logical principle (6-8 lines, approximately).
3. The key words are written closer to the beginning.
4. Phrases are built simply, if possible, without appendage sentences, without involved and non-private turns.
5. As little science and rarely used words as possible.
6. A thought begins and ends in a paragraph.
7. Write the essential elements to know and then be sure to check [4].

Results and Discussion

This is what part an ordinary text in the discipline "Chemical ecology" looks like before the process of its transformation into a quantized text. 254 words used.

Atmospheric air is a vital condition for human existence in a geographic environment. Human health depends on air quality. Consider the biological significance of the main components of the air.

Oxygen O_2 from a biological point of view is necessary for the respiration of plants, animals and humans. Oxygen enters the atmosphere from plants. Plants, absorbing carbon dioxide, break it down, assimilating carbon for the synthesis of organic substances. The liberated oxygen is released into the atmosphere. Due to the vital activity of plants, $0.5*10^{12}$ trillion tons of oxygen is released into the atmosphere annually. This process is called photosynthesis, the total equation of which is written as:

$$nCO_2 + nH_2O \xrightarrow{h\nu} C_nH_{2n}O_n + nO_2$$

Nitrogen N_2 is an inert oxygen diluent, since life is impossible in pure oxygen. The biological role of nitrogen is as follows: 1) in the form of organic compounds is a part of proteins, nucleic acids; 2) in the form of inorganic compounds (ammonium salts and nitrates) is in the soil, from where it enters plants, and then into the body of animals.

The involvement of atmospheric nitrogen in biological circulation begins with nitrogen fixation - the formation of ammonia, and then other nitrogen compounds (nitrites and nitrates) as a result of the activity of soil and aquatic microorganisms:

$$N_2 \rightarrow NH_3 \rightarrow NO_2^- \rightarrow NO_3^-$$

The process of converting nitrogen-containing substances into a form suitable for assimilation by higher plants is called nitrification. The reverse process also occurs in the biosphere: the destruction of nitrates by soil and water bacteria to nitrites, ammonia and molecular nitrogen returning to the atmosphere, i.e. denitrification process.

Using headings, subheadings, paragraphs and highlighting the main concepts in italics text, this text was reconstructed into a quantized educational text in which 190 words.

Atmospheric air is a vital condition for human existence in a geographic environment.

Biological significance of the main components of the air:

Oxygen O_2

O_2 is essential for the respiration of ***plants, animals and humans.*** Oxygen enters the atmosphere from plants.

1. Plants, **absorbing** carbon dioxide;
2. **Break** carbon dioxide;
3. Assimilating carbon for the **synthesis** of organic substances;
4. The liberated oxygen is **released** into the atmosphere.

This process is called ***photosynthesis,*** the total equation of which is written as:

$$nCO_2 + nH_2O \xrightarrow{h\nu} C_nH_{2n}O_n + nO_2$$

Nitrogen N_2

N_2 is inert oxygen diluents.

The biological role of nitrogen:

1. In the form of organic compounds is a part of proteins, nucleic acids;
2. In the form of inorganic compounds (ammonium salts and nitrates) is in the soil. Then it goes into plants. Then into the body of animals.

Nitrogen fixation

The ***formation*** of ammonia and other nitrogen compounds (nitrites and nitrates) as a result of the activity of soil and water microorganisms:

$$N_2 \rightarrow NH_3 \rightarrow NO_2^- \rightarrow NO_3^-$$

Nitrification

The process of ***converting*** nitrogen-containing substances into a form suitable for assimilation by higher plants

Denitrification

The process of ***destruction*** by soil and water bacteria of nitrates to nitrites, ammonia and molecular nitrogen.

Since distance learning, in its understanding, involves more independent work, many difficulties are caused by the organization of this process, both on the part of the teacher and on the part of the student. According to N.V. Glushchenko, the increasing role of students' independent work raises the problem of studying and creating educational texts to the category of central ones [5]. It is the educational text that appears as a source of didactic information that determines the content and nature of the student's independent activity. It is the content of the information source, in most cases of the lecture material that determines the success of the student's assimilation of the topic. Therefore, it is necessary to pay great attention not only to the content of the educational material and strictly observe the elementary requirements: clarity, accuracy, consistency of the presented material.

Another problem that almost every teacher encounters is that many students, during a lecture, cannot make a supporting summary, they either write down all the material, or only what, in their opinion, is an important point of the presented material. Difficulties of another kind arise here; most students cannot highlight the main and important in the text. The reason for this is too complicated texts, ambiguity of expressions, frequent use of many speech structures, diffuse expressions [6].

In accordance with the theory of quantization of educational texts, absolutely any text can be made simple and understandable for students. Using the example of a text

fragment on chemical ecology, one can step by step consider a text transformation algorithm:

The past, present and potential global threat of environmental pollution and degradation is one of the main factors that has an effect on the formation of society's environment. Environmental pollution and degradation can be caused by chemical substances, physical factors or the development of undesirable living organisms. Pollutant is any substance released into the environment as a result of human activity or natural processes that has an adverse impact on living organisms. Environmental degradation means that the environment becomes unusable for its designed purposes or that the development of living organisms and their communities in the environment is disturbed.

1. It is necessary to shorten sentences; this can be done by dividing a complex sentence into a simpler one, using understandable words:

The past, present and potential global threat of environmental pollution and degradation is one of the main factors that has an effect on the formation of society's environment.

The main factors affecting the formation of the environment of society – the global threat of pollution and environmental degradation

2. It is necessary to highlight the basic concepts (italics, bold):

The main factors affecting the formation of the environment of society – the ***global threat of pollution*** *and* ***environmental degradation***

3. It is necessary to divide the text into paragraphs, according to a logical principle using headings and subheadings:

Pollution and **environmental degradation**

The main factors affecting the formation of the environment of society – the **global threat of pollution** and **environmental degradation.**

Causes of environmental pollution and degradation:

1. *chemical substances*
2. *physical factors*
3. *development of undesirable living organisms*

Pollutant is any substance released that has an adverse impact on the environment and living organisms. Arising as a result of human activity or natural processes.

When the development of living organisms and their communities is disturbed in the environment, **environmental degradation** occurs.

Conclusions

The introduction of the technology of quantizing educational texts has greatly facilitated the process of distance learning. Based on this, the main positive aspects can be identified: students better perceive modified texts; the process of mastering the educational material has been significantly reduced; learning material is memorized faster; quantized texts have proven their effectiveness in the student's independent work. In our opinion, a

quantized educational text is the most convenient option for transferring text material from a teacher to a student in the form of online learning.

References:

1. Aimagambetov A.K., (2020). Glava MON o perekhode na distantsionnoye obucheniye // [Minister on the transition to distance learning]. Tengrinews.kz [In Russian].
2. Gusenova F.A., (2020). Rol' distantsionnogo obucheniya segodnya // [The role of remote learning today]. Zhurnal «StudNet» - «StudNet» journal, № 7, 246-25, [In Russian].
3. Novoselova D.V., Novoselov D.V., (2020). Distantsionnoye obucheniye v usloviyakh pandemii // [The distance learning in a pandemic]. Zhurnal «Teoriya i praktika nauchnykh issledovaniy: psikhologiya, pedagogika, ekonomika i upravleniye» - «Theory and practice of scientific research: psychology, pedagogy, economics and management » journal, № 3 (11), 35-38, [In Russian].
4. Avanesov V.S. (2014). Primeneniye testovykh form v novykh obrazovatel'nykh i attestatsionnykh tekhnologiyakh // [The use of test forms in new educational and certification technologies]. Zhurnal «Sovremennaya vysshaya shkola: innovatsionnyy aspect» - «Modern higher school: innovative aspect» journal, № 4, 4-14, [In Russian].
5. Avanesov V.S. (2014). Kvantovaniye uchebnykh tekstov: tsel', pravila, priyomy // [Quantization of educational texts: purpose, rules, and methods]. Zhurnal «Shkol'nyye tekhnologii» - School technology journal, № 5, 149-158, [In Russian].
6. Glushchenko N.. (2014). Uchebnyy tekst kak ob"yekt issledovaniya // [Educational text as an object of research] URL: http://ilogoped.ucoz.ru/publ/uchebnyj_tekst_kak_obekt_ issledovanija/1-1-0-1. [In Russian].