ISSN 2518-1491 (Online),
ISSN 2224-5286 (Print)

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ

Д.В.СОКОЛЬСКИЙ АТЫНДАҒЫ «ЖАНАРМАЙ,
КАТАЛИЗ ЖӘНЕ ЭЛЕКТРОХИМИЯ ИНСТИТУТЫ» АҚ

Х А Б А Р Л А Р Ы

ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН

АО «ИНСТИТУТ ТОПЛИВА, КАТАЛИЗА И
ЭЛЕКТРОХИМИИ ИМ. Д.В. СОКОЛЬСКОГО»

N E W S

OF THE ACADEMY OF SCIENCES
OF THE REPUBLIC OF KAZAKHSTAN

JSC «D.V. SOKOLSKY INSTITUTE OF FUEL,
CATALYSIS AND ELECTROCHEMISTRY»

ХИМИЯ ЖӘНЕ ТЕХНОЛОГИЯ СЕРИЯСЫ
♦
СЕРИЯ ХИМИИ И ТЕХНОЛОГИИ
♦
SERIES CHEMISTRY AND TECHNOLOGY

5 (431)

ҚЫРКҮЙЕК – ҚАЗАН 2018 ж.
СЕНТЯБРЬ – ОКТЯБРЬ 2018 г.
SEPTEMBER – OCTOBER 2018

1947 ЖЫЛДЫҢ ҚАҢТАР АЙЫНАН ШЫҒА БАСТАҒАН
ИЗДАЕТСЯ С ЯНВАРЯ 1947 ГОДА
PUBLISHED SINCE JANUARY 1947

ЖЫЛЫНА 6 РЕТ ШЫҒАДЫ
ВЫХОДИТ 6 РАЗ В ГОД
PUBLISHED 6 TIMES A YEAR

АЛМАТЫ, ҚР ҰҒА АЛМАТЫ, НАН РК ALMATY, NAS RK

NAS RK is pleased to announce that News of NAS RK. Series of chemistry and technologies scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of News of NAS RK. Series of chemistry and technologies in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential content of chemical sciences to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы "ҚР ҰҒА Хабарлары. Химия және технология сериясы" ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Webof Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабарлары. Химия және технология сериясы Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді химиялық ғылымдар бойынша контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Известия НАН РК. Серия химии и технологий» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Известия НАН РК в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному контенту по химическим наукам для нашего сообщества.

«ҚР ҰҒА Хабарлары. Химия және технология сериясы».
ISSN 2518-1491 (Online),
ISSN 2224-5286 (Print)
Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» Республикалық қоғамдық бірлестігі (Алматы қ.)
Қазақстан республикасының Мәдениет пен ақпарат министрлігінің Ақпарат және мұрағат комитетінде 30.04.2010 ж. берілген **№1089-Ж** мерзімдік басылым тіркеуіне қойылу туралы куәлік

Мерзімділігі: жылына 6 рет.
Тиражы: 300 дана.

Редакцияның мекенжайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., 220, тел.: 272-13-19, 272-13-18,
www:nauka-nanrk.kz / chemistry-technology.kz

Типографияның мекенжайы: «Аруна» ЖК, Алматы қ., Муратбаева көш., 75.

«Известия НАН РК. Серия химии и технологии».
ISSN 2518-1491 (Online),
ISSN 2224-5286 (Print)
Собственник: Республиканское общественное объединение «Национальная академия наук Республики Казахстан» (г. Алматы)
Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов Министерства культуры и информации Республики Казахстан **№10893-Ж,** выданное 30.04.2010 г.

Периодичность: 6 раз в год
Тираж: 300 экземпляров

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28, ком. 219, 220, тел. 272-13-19, 272-13-18,
http://nauka-nanrk.kz / chemistry-technology.kz

Адрес редакции: 050100, г. Алматы, ул. Кунаева, 142,
Институт органического катализа и электрохимии им. Д. В. Сокольского,
каб. 310, тел. 291-62-80, факс 291-57-22, e-mail:orgcat@nursat.kz
Адрес типографии: ИП «Аруна», г. Алматы, ул. Муратбаева, 75

News of the National Academy of Sciences of the Republic of Kazakhstan. Series of chemistry and technology.
ISSN 2518-1491 (Online),
ISSN 2224-5286 (Print)
Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)
The certificate of registration of a periodic printed publication in the Committee of Information and Archives of the Ministry of Culture and Information of the Republic of Kazakhstan N 10893-Ж, issued 30.04.2010

Periodicity: 6 times a year
Circulation: 300 copies

Editorial address: 28, Shevchenko str., of. 219, 220, Almaty, 050010, tel. 272-13-19, 272-13-18,
http://nauka-nanrk.kz / chemistry-technology.kz

Editorial address: Institute of Organic Catalysis and Electrochemistry named after D. V. Sokolsky
142, Kunayev str., of. 310, Almaty, 050100, tel. 291-62-80, fax 291-57-22,
e-mail: orgcat@nursat.kz

Address of printing house: ST "Aruna", 75, Muratbayev str, Almaty

N E W S
OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN
SERIES CHEMISTRY AND TECHNOLOGY
ISSN 2224-5286 **https://doi.org/10.32014/2018. 2518-1491.18**
Volume 5, Number 431 (2018), 139 – 145

UDC 303.443.3

A.D. Kalimukasheva, D.Z. Kalimanova, Z.A. Imankulova

Atyrau State University named after Kh. Dosmukhamedov, Atyrau, Kazakhstan
dana80_04@mail.ru, aral1959@mail.ru, zhmm1331@gmail.com

FORMATTIVE EVALUATION IS AN UNINTERRUPTABLE PART OF THE TRAINING PROCESS ON LESSONS OF CHEMISTRY

Abstract. In recent years, the world pedagogy is in the process of rethinking the system for assessing students' learning achievements, since evaluation is one of the main stages of the educational process. One of the goals of the school is to create conditions conducive to the pursuit of self-education, self-knowledge of the individual, the development of motivation to achieve success, that is, the formation of key competencies of students. According to the State Program for the Development of Education in the Republic of Kazakhstan for 2011-2020, when evaluating students' learning achievements it is important to focus on the process of developing the key competencies of the future specialist. And for this it is necessary to make significant changes to the traditional system of knowledge assessment.

Keywords: formative evaluation, summary estimation, criterion estimation, teacher assessment, self-evaluation.

INTRODUCTION

One of the significant indicators of the effectiveness of secondary education is the level of educational achievements of students, which demonstrates how the educational activity in the school functions, develops, affects the students and their effectiveness. Therefore, the level of the potential in improving the quality of education depends on how well the system of assessing the educational achievements of students is built up. (1) In the National Plan "100 concrete steps", the Head of State pointed out, as a fundamental basis for economic growth, improving the quality of human capital based on OECD standards.

MAIN PART

The implementation of the OECD direction provides for the updating of standards and evaluation systems for the development of functional literacy of students. In the OECD report "Review of the national educational policy. Secondary Education in Kazakhstan "(2014) proposed a number of measures aimed at improving the quality, relevance and frequency of the assessment in the classroom. In particular, the introduction of a criteria-based assessment system, the definition of evaluation criteria for high-level thinking skills, the training of teachers, the conduct of national standardized testing at the end of each stage of education, the establishment of an effective and reliable data collection system, etc. It also indicates the need for effective use of the results of the conducted evaluation. (5) Criterial evaluation is the process of correlating the learning outcomes actually achieved by students with the expected learning outcomes on the basis of clearly defined criteria. The purpose of the criterial evaluation is to obtain objective information about the results of training the students on the basis of evaluation criteria and to provide it to all interested participants for further improvement of the educational process. To collect data on progress and progress in learning during the school year, two types of evaluation are carried out: formative assessment and summary evaluation. The cumulative assessment, in turn, includes procedures for cumulative assessment for the section / cross-cutting theme, a quarter and level of education.

Table 1 - Two types of estimation

Formative	Summative
is made during training (with the help of small independent works, tests, etc.)	at the end of the studied topic or section (with the help of control or credit work)
helps the student to adjust his work, achieve better results	allows students to demonstrate their achievements on the topic
allows the teacher to accumulate information about the assimilation of the material by each student, to analyze it and plan further work, that is, to carry out a more qualitative learning process	gives the teacher the opportunity to make a final judgment about the students' achievements, to set the final marks

The developed system of criterial estimation, which integrates the best Kazakhstani and international experience, allows us to proceed to the implementation of the assigned tasks in the lessons, in particular chemistry.

The content of the system of criterial evaluation is determined by standards, processes, tools and evaluation results. (3)

(Figure 1).

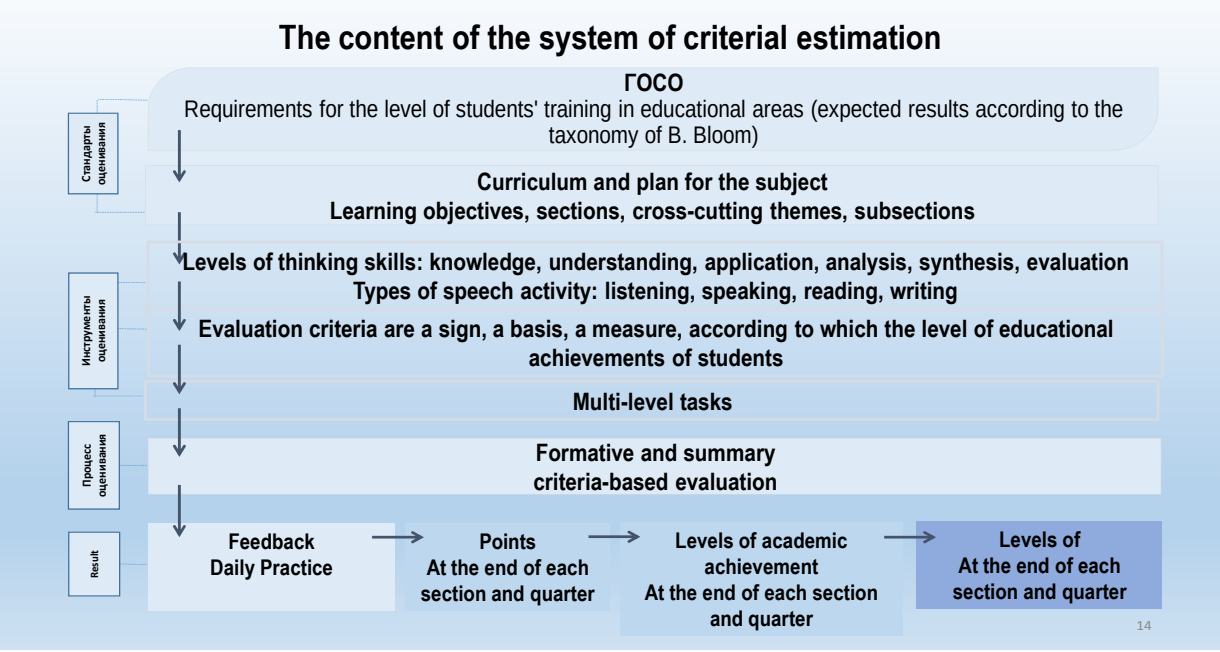


Figure 1 - The process of formative estimation

Formative assessment is a process that has a direct impact on the growth and development of learning achievements and provides feedback between the teacher and the learner. Formative evaluation takes on an increasingly important role in international practice and is generally defined as the assessment used to adapt teaching and learning to the needs of learners (Black and William, 1998; Ashcroft and Foreman-Pack, 1994; Taras, 2005). At the same time, analysis of the literature suggests that the description of the structural elements of formative evaluation is treated ambiguously and can vary depending on the objectives and conditions of application.

Structure of Formative Assessment:

Structure of Formative OECD Assessment / International Conference of the Center for Research in Education and Innovation (2008) :

- Create a culture in the classroom
- Formulate learning objectives
- Use a variety of teaching methods to meet the different needs of students
- Use different approaches to assessing students' understanding of the material
- Provide feedback to learners and adapt the learning process to identified needs

• Actively involve learners in the learning process

Black and William (2010):

• Design effective discussion in the classroom, apply questions and assignments that can be used as evidence of learning outcomes

• Provide feedback, which is aimed at developing students

• Clarify evaluation criteria and expected results

• Encourage the development of learners as creators of their own learning

• Use trainees as sources and resources for mutual learning

Clarke (2013):

• Develop a culture of learning

• Engage students in the planning phase

• Make assessment criteria together with students who know the learning objectives

• Use discussions and discussions in class

• Promote effective feedback from students, peers and teachers. (6)

Thus, as the general elements among the presented structures of formative evaluation can be identified: the active involvement of students in the assessment process, the adaptation of teaching to the needs of students, the provision of quality and constructive feedback. Therefore, formative evaluation is the practice of the teacher, which allows you to integrate learning and assessment through a set of interrelated elements in the lesson. Expected results and learning objectives for each section of the curriculum determine the content of the practice of formative evaluation. In this case, the process of formative evaluation will not be standardized, i.e. each teacher can independently determine his own practice and be responsible for its results. The process of formative evaluation in the activities of the teacher involves the implementation of the following stages:

• Planning and organization of formative evaluation;

• choice of methods of formative evaluation;

• providing feedback;

• analysis of the results of formative evaluation.

Planning and organization of formative evaluation

In order to plan an effective process of formative evaluation that meets the needs of students, the teacher is given the opportunity to independently determine the form, content and frequency, as well as tools for formative evaluation. The teacher needs to include in the learning processes and formative evaluation all the objectives of the training according to the curriculum. To this end, collections of assignments for formative evaluation have been prepared to help the teacher, including evaluation criteria for the purposes of training, sample assignments with descriptors. The collections of formative evaluation are used as a source for the selection of tasks in the planning of the lesson and do not require printing. For the independent development of tasks of formative evaluation, the teacher is recommended:

• Study the curriculum, curriculum and conduct learning goals analysis;

• Draw up evaluation criteria based on training objectives according to the curriculum;

• To distribute the evaluation criteria according to the levels of cognitive skills in order to ensure a differentiated approach to the formulation of tasks;

• Develop a task in accordance with the evaluation criteria;

• Draw up descriptors to the task, which describe the main stages of its implementation.

Teacher develops or selects tasks in accordance with the needs of the students and the context of training. (1)

3. Experimental part.

Examples of the formative task on the subject "Chemistry" Grade 7

Section 7.1A Introduction to Chemistry. Pure substances and mixtures

Subject Chemistry subject

The purpose of the training 7.1.1.1 To know what the science of chemistry is studying

Evaluation Criteria

• Formulates the definition of chemistry as a science

Level of Cognitive Skills: Knowledge and Understanding

Exercise 1

Using the proposed set of words, formulate the definition of chemistry as a science:

Chemistry, substances, science, properties, transformations, about, structure, them, and

Descriptor *Learning*

- formulates the definition of chemistry as a science, placing the proposed set of words in the correct sequence.
- understands the meaning of the word "Chemistry"
- Concludes on the science of chemistryЗадание 2

Indicate suggestions where it comes to chemistryИз древесины делают бумагу

1) Combustion of iron is accompanied by a crackle and a "firework" of sparks
2) Potatoes belong to the family of solanaceous
3) Health is the main value of a person
4) Petrol is obtained from oil

Descriptor *Learning*

- correctly indicates the proposals in which we are talking about chemistry
- Fills his choice

Activity 3

Insert the missed words in the sentence (using paragraph 1)

Substances, elements, experiment, processing, science.

1. The subject of studying chemistry are chemical ....., the simple and complex substances they form.
2. Chemical ..... allows theoretical knowledge to be confirmed in practice.
3. The tasks of chemistry and chemical industry are ..... natural and synthetic raw materials, release of various materials and products.
4. To obtain many food products use a variety of chemical .....
5. Chemistry is an experimental .....

Descriptor trainee - defines suitable words in the sentence

- justifies his answer (2)

Section 7.1.V. Change in the state of substances

Subject: Aggregate state of substances

The purpose of study: To know the various aggregate states of substances and to be able to explain the structure of solid, liquid, gaseous substances according to the kinetic theory of particles.

Evaluation Criterion: Studying

Distinguishes the aggregate state of matter

Level of Cognitive Skills: Knowledge and Understanding

Exercise 1

Divide the substances according to their aggregate state into three groups:

Ice, oxygen, air, tea, ice cream, chocolate, chalk, nail, water, nitrogen, sugar, cola, board, milk, oil.

Gaseous	Liquid	Solid

Descriptor *Learning*

1. Distinguishes gaseous substances
2. Distinguishes solids
3. Distinguishes liquid substances
4.Hows to place the proposed substances in the appropriate columns

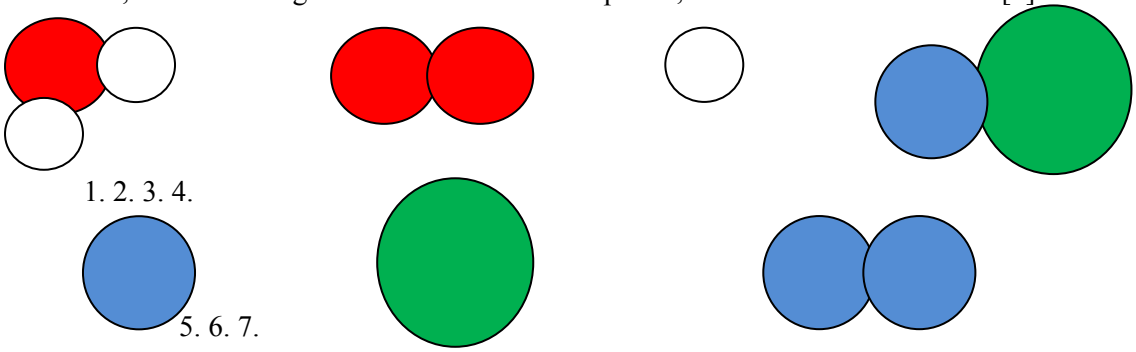
Activity 2

Which statements do you think are correct (yes) and which ones are wrong (no)

1. In the solid state between particles, the attraction is strong
2. Liquid substances retain volume
3. Gaseous substances have no shape and volume
4. In a solid matter, particles can freely move relative to each other

5. In gaseous substances, the particles move rapidly
Descriptor *Learning*
1. Explains the position of particles in gaseous substances
2. Explains the position of particles in solids
3. Explains the position of particles in liquid substances
4. Understands the features of motion and interaction between particles of matter
5. Establishes the relationship between the arrangement of particles and their aggregate state
Activity 3
Establish compliance (using the scheme number 1 in the textbook, page
1. Steam formation A. Burning of a candle
2. Crystallization B. Formation of dew
3. Melting C. The formation of frost
4. Condensation C. Boiling water
Descriptor *Learning*
- correlates processes with natural phenomena
Activity 4
A-ice B-water with water vapor
1 level
Correlate models of the state of atoms with the aggregate state of matter
Level 2
1) The forces of attraction between the particles are insignificant
2) Weak forces of attraction between molecules
3) The attraction between particles is strong
3 level
1) particles freely move relative to each other during transfusion take the form of a vessel
2) the particles move quickly and chaotically, the substances do not have a shape and volume
3) the particles make constant oscillatory movements, retain their shape and volume
Descriptor *Learning*
1 distinguishes models of solids
2 distinguishes between gas models
3 distinguishes between models of liquids
4 knows the peculiarities of the arrangement of particles in substances with different aggregate states
5 establishes the relationship between the arrangement of particles and their aggregate state. (2)
Section. 7.2 A

The theme of Atoms and molecules. Chemical elements
The purpose of study 7.1.2.1 is to describe the difference between atoms and molecules
Level of skills and thinking Understanding
Evaluation criteria Describes the difference between atoms and molecules
The task
Molecules consist of smaller particles - atoms.
Consider the drawing.
Write out, under what figures are the molecules depicted, and under which - atoms? [2]



Molecules: Atoms:

Criteria
Describes the difference between atoms and molecules
Descriptors
Correctly marks the picture of all the molecules.
Correctly marks the picture of all atoms. (2)

The descriptors used for assignments must be clear and precise, so that the teacher's decision during the assessment is objective. Descriptors allow you to determine at which stage of the assignment the student is experiencing difficulties. This helps to provide feedback to students. According to the theory of formative evaluation (William, 2007), three positions of the organization are assumed, taking into account the participants in the process: teacher assessment, self-evaluation and mutual evaluation. (6)

Teacher assessment.

Much of what is reflected in this manual characterizes the teacher's assessment process. Therefore, on how well the teacher can understand the proposed recommendations, adapt, apply and improve them depends the success of his practice of formative evaluation.

Self-evaluation.

CONCLUSION

At school it is necessary to instill skills and accumulate experience of self-evaluation among students. The main focus in the organization of self-evaluation of students is given to stimulating self-regulation and independent learning. Self-evaluation of students helps self-analysis of strengths and weaknesses in the learning process. It is important to teach the learner to objectively determine what he knows and what skills he owns, determine his own gaps, which he as a result wants to achieve. However, there are cases when the self-esteem of students is excessively overstated or understated. This reduces the overall positive effect of self-assessment in class. Teachers can help such students be more objective. (4)

REFERENCES

[1] Teacher's Guide, Nazarbayev Intellectual Schools.

[2] Chemistry textbook 7 class Ospanova MK, Belousova TG, Aukhadieva KS - Almaty: Mektep, 2017 year.

[3] A methodological manual for monitoring students' knowledge, taking into account criterial evaluation. - Astana: Autonomous organization of education "Nazarbayev Intellectual schools", 2012.

[4] Evaluation of educational achievements of students. Methodical.

[5] guide. / Comp. R.H.Shakirov, A.A.Burkitova, O.Dudkin. B.: "Білім", **2012**. 80 c.

[6] OECD. Secondary education in Kazakhstan: Review of the national educational policy. Astana: IAC, **2014**.

[7] William D. Changing practice in the classroom. Notes from the studies of Sh. Clark, D. Williams and the National Strategy. **2008**.

[8] www.enu.kz/repository/repository2014/kriterial'noe-ocenirovanie.pdf.

[9] Galimova N.Zh., Kalimanova D.Zh. Determination of petroleum hydrocarbons in bottom sediments // XII International scientific and practical conference "Fundamental and applied problems of obtaining new materials: research, innovations and technologies" Russian Federation Astrakhan April 24-27, 2018. ISBN 978-5-91910-686- 9.

[10]A. Kenzhegaliev, A.Abilgazieva, A.Kh. Shakhmanova, D.Z. Kalimanova. Assessment of the ecological status of the hydrobionts of the northern Caspian Sea in connection with the forthcoming oil production / / Monograph Almaty 2008. 192s. ISBN 9965-405-22-0.

[11]Kalimanova D.Z. The author's abstract of the dissertation "Ecological features of zoobenthos in the north-eastern part of the Caspian Sea" Astrakhan, 2008.

УДК 303.443.3

А.Д. Калимукашева, Д.Ж. Калиманова, З.А. Иманкулова

Атырауский государственный университет им.Х.Досмухамедова, Атырау, Казахстан

ФОРМАТИВТІ БАҒАЛАУ - ХИМИЯ САБАҚТАРЫНДА ОҚЫТУ ПРОЦЕСІНІҢ АЖЫРАМАС БӨЛІГІ

Аннотация. Соңғы жылдары әлемдік педагогика оқушылардың оқу жетістіктерін бағалау жүйесін қайта қарастырады, өйткені бағалау - оқу процесінің негізгі кезеңдерінің бірі. Мектептің мақсаттарының бірі - өздігінен білім алу, жеке тұлғаның өзін-өзі тану, табысқа жету үшін ынталандыру, яғни студенттердің негізгі құзіреттіліктерін қалыптастыру үшін жағдай жасау. Қазақстан Республикасында білім беруді дамытудың 2011-2020 жылдарға арналған мемлекеттік бағдарламасына сәйкес, оқушылардың оқу жетістіктерін бағалау кезінде болашақ маманның негізгі құзыреттерін дамыту процесіне баса назар аудару керек. Бұл үшін білімнің дәстүрлі жүйесін бағалауға елеулі өзгерістер енгізу қажет.

Түйін сөздер: қалыптастырушы бағалау, қорытынды баға, критериалды бағалау, мұғалімдерді бағалау, өзін-өзі бағалау.

Information about authors:

Kalimukasheva A.D. - Atyrau State University named after Kh. Dosmukhamedov, Atyrau, Kazakhstan, dana80_04@mail.ru, https://orcid.org/0000-0001-6904-3218;

Kalimanova D.Z. - Atyrau State University named after Kh. Dosmukhamedov, Atyrau, Kazakhstan, aral1959@mail.ru, https://orcid.org/0000-0001-9625-3958;

Imankulova Z.A. - Atyrau State University named after Kh. Dosmukhamedov, Atyrau, Kazakhstan, zhmm1331@gmail.com, https://orcid.org/0000-0002-4928-1339

МАЗМҰНЫ

СОДЕРЖАНИЕ

CONTENTS

Publication Ethics and Publication Malpractice in the journals of the National Academy of Sciences of the Republic of Kazakhstan

For information on Ethics in publishing and Ethical guidelines for journal publication see http://www.elsevier.com/publishingethics and http://www.elsevier.com/journal-authors/ethics.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the described work has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see http://www.elsevier.com/postingpolicy), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct (http://publicationethics.org/files/u2/New_Code.pdf). To verify originality, your article may be checked by the Cross Check originality detection service http://www.elsevier.com/editors/plagdetect.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of Sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of Sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации
в журнале смотреть на сайте:

www:nauka-nanrk.kz

http://www.chemistry-technology.kz/index.php/ru/

ISSN 2518-1491 (Online), ISSN 2224-5286 (Print)

Редакторы: *М. С. Ахметова, Т. А. Апендиев, Аленов Д.С.*
Верстка на компьютере *А.М. Кульгинбаевой*

Подписано в печать 11.10.2018.
Формат 60x881/8. Бумага офсетная. Печать – ризограф.
9,8 п.л. Тираж 300. Заказ 5.

Национальная академия наук РК
050010, Алматы, ул. Шевченко, 28, т. 272-13-18, 272-13-19