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РАСКРЫТИЕ ПРОБЛЕМЫ ЕСТЕСТВЕННО-МАТЕМАТИЧЕСКОГО ОБРАЗОВАНИЯ ДЕВОЧЕК  
В КОНТЕКСТЕ МИРОВЫХ НАУЧНЫХ ИССЛЕДОВАНИЙ

*В статье раскрывается вопрос естественно-математического образования девочек в контексте современных психологических, педагогических и гендерных теорий. В частности анализируются взгляды современных ученых на исследуемую проблему, выделяются преимущества и недостатки раздельного образования. Отдельно рассмотрено понятие гендерной сегрегации в образовании. В рамках целей статьи анализируются результаты международных исследований качества образования PISA и TIMMS относительно гендерного разрыва, который существует в естественно-математическом образовании. Акцентировано внимание, что это явление в естественно-научной и математической подготовке имеет в том числе и исторические предпосылки, что подтверждается фактами из истории женского образования.*

*Ключевые слова: женское образование, гендер, естественно математическое образование, PISA, TIMMS.*

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REPRESENTATION OF THE PROBLEM OF GIRLS' NATURAL  
AND MATHEMATICAL EDUCATION IN THE CONTEXT OF GLOBAL RESEARCH

*The article deals with the representation of the problem of girls' natural and mathematical education in the context of modern psychological, pedagogical and gender theories. In particular, the contemporary scholars' viewpoints on the research problem are analyzed; the advantages and disadvantages of separate education are highlighted. The concept of gender segregation in education is considered, that is a background for the existence of gender horizontal and vertical segregation of the labour market. In the context of the purpose of the article, the results of international studies of education quality PISA and TIMMS concerning the gender gap that exists in natural and mathematical education are analyzed. It is emphasized that this phenomenon in natural science and mathematical preparation also includes the historical background, which is confirmed by the facts from the women's education history, as previous to the beginning of the twentieth century the boys' and girls' education is separate. On the basis of the analysis, it is concluded that girls' natural and mathematical education is an actual historical, pedagogical and psychological problem. Scientists' views on this phenomenon are different, but international studies that have been conducted around the world confirm the existence of a gender gap in natural science and mathematical education, which is being addressed by the efforts of the states all over the world. However, the girls' separate education has its own advantages that can be used to improve the educational process of modern educational institutions.*

*Key words: women's education, gender, natural and mathematical education, PISA, TIMMS.*

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HISTORICAL ASPECTS OF MONITORING STUDENTS' LEARNING OUTCOMES  
IN UKRAINIAN MARITIME ESTABLISHMENTS (END OF 20TH CENTURY)

*The article deals with the historical background of monitoring students' learning outcomes in Ukrainian maritime establishments in the end of 20th century. The basic tendencies of monitoring process development are pointed. Author describes main requirements and forms of monitoring in the Ukrainian maritime establishments in the end of 20th century, such as assessment of all the current results, intermediate and final knowledge control scores; determined by their sum of the student's rankings for a certain period of study; weekly calculations; the system of counting hours, while the index of success was determined by multiplying the ratings for each course passed on the number of set hours. It was stated that in the end of 20th century in the Kherson Maritime College monitoring of learning*

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outcomes was carried out at several levels: the level of the dean's office, the level of departments.

*Key words:* monitoring, assessment, maritime students, learning outcomes educational process, quality, rating, points.

*Introduction.* The development of the maritime industry is characterized by high requirements for the maritime officers' professional competence. Shipping companies need a marine specialist who can work on the final result, able to think creatively, make decisions in non-standard situations. STCW 78/95, as an international convention specifically setting standards for seafarers, is now under reviewing and amending. Main reasons for such a review include: the fast development of world shipping industry, more applications of new maritime technologies onboard, stricter standards in maritime safety and pollution prevention, more functions of human factors in maritime technical operations, as well as the flaws in the original convention. All this puts forward in the field of maritime education the problem of finding ways to improve the quality of training of specialists, such as monitoring of students learning outcomes, which serves as a mean of stimulating their professional maturity, promotes deepening, expansion, improvement and systematization of students' knowledge, skills and abilities, provides feedback in studying. In this context, the problem of monitoring students' learning outcomes in maritime educational establishments requires, first of all, consideration of the historical issue as a background for improving of the maritime education quality.

*Analysis of relevant researches.* A number of foreign and native authors highlight the problem of monitoring students' learning outcomes as significant ones. Among the foreign authors who investigated various aspects of monitoring activity, one should highlight the works of V. Avanesov, D. Campbell, D. Matros, N. Melnikov, O. Kasyanov, and others. N. Baidatska, I. Bulakh, I. Boychuk, L. Kaidalova, V. Kumenko, O. Lokshina, etc. devoted their thesis to monitoring of education quality in Ukrainian institutions. O. Chorny analyzes the activity of marine profile educational institutions in the South of Ukraine, O. Timofeeva in her work on the history of maritime education in Ukraine and modern scientific approaches speaks about the formation of social and communicative competence of future navigators.

*Originality.* However, the scientific research suggests that the problem of monitoring students' learning outcomes and its historical development is still not sufficiently investigated.

*The aim of the article* is to describe historical aspects of monitoring student's learning outcomes in maritime institutes in the end of 20<sup>th</sup> century.

*Main part.* Monitoring educational quality has been an important research topic for as long as assessment of educational process has existed. V. Kuzmenko defines the concept of monitoring as «the diagnosis, evaluation and prediction of the pedagogical process: tracking its progress, results, prospects» [4, p. 51]. According to T. Lokshina, pedagogical monitoring is the control and the current adjustment of the teacher's and student's interaction in the organization and implementation of the educational process [3, p. 8].

L. Kaidalova notes that monitoring of professional training involves the examination, observation and analysis of the learning process and provides opportunities for obtaining and using information about the adequacy of pedagogical technologies, forms, methods and means; to make correction of the educational process [1, p. 18].

We share the point of view of V. Kovalev, that monitoring of students' learning outcomes in the system of management quality should diagnose not only cognitive (knowledge) and interaction (skills and abilities) components of learning outcomes, but also motivational-value readiness and attitude components. Valuable monitoring procedures should provide an opportunity for an integrated assessment of competences acquired through the process of training [2, p. 35].

The scientist offers a system of criteria for assessing the quality of marine specialists training:

- criterion 1 - the quality of training of marine specialists;
- criterion 2 – the quality of graduates' prospects.

Scientific research of literature showed that in the 70-90 years of the twentieth century in the practice of maritime educational institutions, the assessment of the success and quality of student knowledge was carried out on the basis of the current accounting for a digital five-point system: excellent, good, satisfactory, bad, very bad [6, p. 105].

O. Chorniy, analyzing the activity of educational institutions of the maritime profile in the South of Ukraine, notes that only from the end of the twentieth century the practice of Ukrainian maritime educational institutions introduces a system of monitoring, since the beginning of the 1990s the processes of higher education institutions integration into the European educational environment have become especially acute. There were several forms of monitoring. The first form provided an assessment of all the current results, intermediate and final knowledge control scores, determined by their sum of the students' rankings for a certain period of study. The second was reduced to the results of weekly calculations. The third – the system of counting hours, while the index of success was determined by multiplying the ratings for each course passed on the number of set hours [7, p. 8].

In the end of 20<sup>th</sup> century in the Kherson Maritime College monitoring of learning outcomes was carried out at several levels. At the level of the dean's office, the following events are systematically carried out: analysis of current progress and results of sessions; record of success; analysis of departments information about attending classes and informing chairs about measures to eliminate negative consequences; conducting individual work with students, finding out the reasons that cause difficulties in learning; organizing the work of the elder and engaging them in constant control over the attendance of classes and success; participation in conducting rector's control, knowledge control, etc.

Departments provide: organization of educational process; qualitative teaching and methodological support; high-quality teaching of disciplines; systematic conduct of all types of incoming, current and final control; assessment and diagnosis of students' academic achievements; constant feedback from the dean's office, structural units of the university on issues of attendance, success, modular control, etc.

In the characterized period, according to scientists' researches, in the practice of the institutions the assessment and rating started to carry out. It was used for organizing educational and cognitive activity of students, increasing their motivation to study at the expense of the constant control of knowledge and skills, competition and incentive system, reduced emotional tension of students, evaluation of knowledge. Such organization of educational and cognitive activity intensified the work of students during the semester, encouraged them to work systematically and independently, expanded opportunities for a comprehensive disclosure of students' abilities, developed creative thinking, expanded the boundaries of independent work [6, p. 14].

According to V. Kuzmenko, rating is not just a fundamentally new system of quality control of knowledge, but a virtually new technology of the educational process. It is a thin, flexible and effective means of influencing the student, which is much better suited to the requirements of development and manifestation of personality, needs [4, p. 19].

In the English translation «rating» means an assessment, rank, scale. In the modern terminological sense, it is a related integral index or a complex indicator of student success, its development at a certain stage. The rating is based on the accumulation of ratings for a certain period of study (semester, academic year, period of study). This is the sum of student-acquired points for a certain period of time and for a variety of educational and cognitive activities, which is an indicator of the quality of his work in relation to the maximum number of points and successes of other students in teaching [1, p. 20].

As research showed the number of rating control were applied in the end of 20<sup>th</sup> century. The general principles of building a rating system were such:

- each academic discipline, the student's work on mastering it is evaluated in points, the sum of which rating is determined;
- compulsory accounting of students' current work, which is then reflected in the final

evaluation;

- the complexity and significance of a specific discipline in the curriculum is taken in the account, which is called a weighting factor, or multiplier of complexity;
- provides various types of control (control sections), in particular, incoming, current, thematic, summary, etc.;
- the results are often summed up for semesters, as well as gradually and necessarily - for the entire period of study;
- the student's educational rating for a certain period was defined as the average of the rating of each discipline from which the score or exam took place;
- the possibility of transferring the points scored to the usual rating system [1, p. 22].

O. Timofeeva, revealing the organization of rating assessment of students' knowledge, noted that in the historical period covered by the rating, individualization of education was carried out, in addition, the system made it possible to control the pedagogical process at intermediate stages of learning and opened the possibilities of timely introduction appropriate corrections. With the modular rating system and cognitive activity of students, the importance of current progress monitoring and final evaluations was important. This ensured that the evaluation of the discipline studied was objective. The current accounting of the students' learning outcomes results was conducted by a teacher in accordance with the schedule of monitoring department (if it was in maritime institutions) or dean's office [5, p. 263].

In order to stimulate student's activity, increase their motivation in the rating system, the penal and bonus points were created. Penal points were introduced for omissions of lessons without a valid reason, plagiarism, unauthorized use of reference literature, cheat sheets, self-executing individual tasks, untimely execution. Appointment of penalty points contributes to the education of self-discipline and student's responsibility. Bonus points were awarded in the form of incentives for the surrender of work before the established deadline, for a creative, unordinary approach to work, the use of sources that were not specified by the teacher. An additional point can be obtained by a student, whose work is largely different from the rest of others. The bonus score can be accrued for a specific job, and maybe added at the end of the semester for active systematic work at seminars, participation in discussions, creative projects, etc.

*Conclusions.* Thus, in the course of scientific research, it was determined that monitoring students' learning outcomes was introduced into the practice of maritime educational establishments since the mid-1990s. In practice, in each of the maritime educational institutions, the general principles of monitoring students' learning outcomes were observed. Analyze of the problem allowed to state the existence of historical background for the emergence of pedagogical monitoring: significant experience in organizing the collection of statistical information, the systematic conduct of statistical research, understanding the relationship of information, analytical and evaluation control of the predictive and corrective functions of education management. It was pointed that well-established monitoring over students' learning outcomes is one of the key determinants in the training of maritime students and is a mean for stimulating their professional competence.

*Prospects for further scientific research* are seen in the analyzing of the normative documents and archives to consider the peculiarities of maritime students' learning outcomes monitoring.

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#### ІСТОРИЧНІ АСПЕКТИ МОНІТОРИНГУ НАВЧАЛЬНИХ ДОСЯГНЕНЬ СТУДЕНТІВ У МОРСЬКИХ НАВЧАЛЬНИХ ЗАКЛАДАХ УКРАЇНИ (КІНЕЦЬ 20 СТОЛІТТЯ)

*У статті висвітлено історичні аспекти моніторингу навчальних досягнень студентів у морських навчальних закладах України кінця 20 століття. Аналіз наукової літератури засвідчив, що лише наприкінці 20 ст. моніторинг навчальних досягнень студентів почав реалізовуватись у практиці вітчизняних морських навчальних закладів, адже з початку 90-х років особливої актуальності набули процеси інтеграції вищих навчальних закладів до загальноєвропейського освітнього простору. Визначено, що в морських навчальних закладах дотримувалися загальні принципи реалізації моніторингу: кожну навчальну дисципліну, роботу студента над її опануванням оцінено в балах; передбачено обов'язковий облік поточної роботи студентів, який потім відображено в підсумковій оцінці; передбачено різні види контролю (контрольних зрізів), зокрема вхідний, поточний, тематичний, підсумковий. У процес наукового пошуку автор виокремлює різні прояви моніторингу в різних морських навчальних закладах: перший тип передбачав оцінювання в балах усіх результатів поточного, проміжного та підсумкового контролю за знаннями й визначення за їх сумою рейтингу кожного студента за певний період навчання; другий зводився до підсумків тижневих заліків; третій – до контролю залікових годин, при цьому індекс успішності визначався перемноженням оцінок за кожний пройдений курс на кількість залікових годин. Автор зазначив, що в основу моніторингу навчальних досягнень студентів у Херсонській державній морській академії (на той час коледжі) було покладено екзаменаційне оцінювання і контроль поточних балів у кожній дисципліні.*

*Ключові слова: моніторинг, оцінювання, студенти морських спеціальностей, навчальні досягнення, навчальний процес, якість, рейтинг, бали.*

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#### ИСТОРИЧЕСКИЕ АСПЕКТЫ МОНИТОРИНГА УЧЕБНЫХ ДОСТИЖЕНИЙ СТУДЕНТОВ В МОРСКИХ УЧЕБНЫХ УЧРЕЖДЕНИЯХ УКРАИНЫ (КОНЕЦ 20 ВЕКА)

*В статье освещены исторические аспекты мониторинга учебных достижений студентов в морских учебных заведениях Украины конца 20 века. Анализ научной литературы показал, что только в конце 20 в. мониторинг учебных достижений студентов начал реализовываться на практике отечественных морских учебных заведений, так как с начала 90-х годов особую актуальность приобрели процессы интеграции высших учебных заведений в общеевропейское образовательное пространство. В процессе научного поиска автор выделяет различные формы мониторинга в морских учебных заведениях. Автор констатирует, что в основу мониторинга учебных достижений студентов в Херсонской государственной морской академии (в то время колледже) было положено экзаменационное оценивания и контроль текущих баллов по каждой дисциплине.*

*Ключевые слова: мониторинг, оценка, студенты морских специальностей, учебные достижения, учебный процесс, качество, рейтинг, баллы.*

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