ABSTRACT

This is the abstract of the dissertation on the topic «Development of a system for assessing the functional literacy of students in computer science based on a criterion approach» for the degree of Doctor of Philosophy (PhD) in the specialty 8D015-Training of teachers in natural science subjects (6D011100-Computer Science)

Avdarsol Sailaugul

Research topic: Development of a system for assessing the functional literacy of students in computer science based on a criterion approach.

The purpose of the study: To scientifically substantiate and develop a system for assessing the functional literacy of students based on a criteria-based approach in computer science.

Research objectives:

- analyze the domestic and foreign practices in the formation of a system for assessing the functional literacy of students;
- analysis of the criterion approach to the evaluation of learning outcomes;
- identify the features of the application of the criterion approach in assessing the functional literacy of students in computer science;
- develop a structural and content scheme of the system for assessing the functional literacy of students based on a criteria-based approach in computer science;
- select the content of tasks and tasks for building a system for assessing the functional literacy of students in computer science;
- show the influence of the system of assessment of functional literacy of students based on the criterion approach in computer science on the teaching methodology;
- test experimentally the effectiveness of the system for assessing the functional literacy of students based on a criteria-based approach in computer science.

Research methods: analytical methods, study of the philosophical, psychological, pedagogical, and methodological materials, normative documents in the education system, computer science curricula; observation, questioning, testing; pedagogical experie,nce and mathematical-statistical calculation were used on the subject of research work.

The main provisions (proven scientific hypotheses and other conclusions that are new knowledge) submitted for defense:

1. The implementation of a system for assessing the functional literacy of students in computer science based on the proposed approaches to the application of the criterion approach, contributes to the orientation of the methodological system of teaching computer science to new results, allows students to be ready to solve practice-oriented tasks due to the individual development of the main components of functional literacy;

2. The structural and content scheme of the system for assessing the functional literacy of students based on the criterion approach in computer science, the components of functional literacy assessment, as well as the selective content of tasks and tasks for building a system for assessing the functional literacy of students in computer science, the use of a system for assessing the functional literacy of students and a system of level tasks based on the criterion approach in computer science, contribute to changing the target approaches to the management and quality assurance of education from the control and evaluation of the quality of education.

3. application of the proposed system for assessing the functional literacy of students based on a criteria-based approach increases the effectiveness of teaching computer science, regarding the requirements of the National Action Plan for the Development of functional Literacy of students.

The main results of the study:

- the features of the application of the criterion approach in assessing the functional literacy of students in computer science are revealed;
- the structural and content scheme of the system for assessing the functional literacy of students based on the criterion approach in computer science has been developed;
- the content of tasks and system development tasks for assessing the functional literacy of students in computer science has been selected;
- a system for assessing the functional literacy of students based on a criterion approach in computer and science has been developed, and its influence on the teaching methodology has been substantiated.

Novelty and importance of the results obtained:

The first result is novel, as the features of the application of the criterion approach in assessing the functional literacy of students in computer science are revealed, and educational and methodological materials in computer science are updated taking into account new results related to the need for the formation of competencies of the XXI century aimed at developing educational motivation and the formation of student's ability to solve practice-oriented tasks, readiness for life.

The second result is novel, as a structural and content scheme of the system for assessing the functional literacy of students based on a criterion approach in computer science has been developed, aimed at updating the content and methodology of teaching computer science, contributing to improving the quality and efficiency of the educational process.

The third result is novel, as the content of tasks and tasks have been selected to increase the criteria for evaluating tasks, the proportion of contextual and structural tasks that are close to problematic situations that arise in everyday life, the creation of a system for evaluating the functional literacy of students in computer science based on the preparation of interactive tasks.

The fourth result is novel, as on the basis of a criterion approach in computer science, including a comprehensive assessment of the results of teaching computer

science, a system for assessing the functional literacy of students has been developed, and its influence on the methodology of teaching computer science has been substantiated.

Compliance with the directions of science development or state programs:

The National Action Plan for the Development of functional literacy of schoolchildren for 2012-2016 (Order No. 832 of June 25, 2012). A standard curriculum for updated content on the subject of "Computer Science" for grades 5-9 at the level of basic secondary education (Order No. 334 of July 26, 2019). The State mandatory standard of preschool education and training, primary, basic secondary, general secondary, technical and vocational, and post-secondary education (Order No. 348 of August 3, 2022). On approval of the criteria for assessing students' knowledge (Order No. 52 of January 21, 2016).

The contribution of the doctoral student to the preparation of each publication (the contribution of the author of the dissertation is shown as a percentage of the total volume of the publication):

1. The model of a system for criteria-based assessing of students' functional literacy and its developmental impact //Journal of Intellectual Disability-Diagnosis and Treatment. -2020. -Vol.8. - Iss. 3. - P.351-357. (Co-authored by: Sagimbaeva A.Y., Zaslavskaya O.Y., Arynova G.S., Baimakhanova A.S. 60%);

2. Criteria-based assessment as the Way of Forming Students' Functional Literacy in Computer Science //Periodico Tche Quimica. -2020. -Vol.17. -Iss. 35. -P. 41-54. (Co-authored by: Sagimbaeva A.Y., Bostanov B.G., Rakhimzhanova L.B., Khakimova T., 40%);

3. Assessment of functional literacy of students in computer science based on the criteria-based approach //Cypriot Journal of Educational Science. -2022. -Vol.17. -Iss. 4. -P.1227-1243. (Co-authored by: Yesengazyevna S.A., Meruert Y., Mynturganovna B.A., Daurenbekov K., 50%);

4. Oqýshylardyń fýnktsıonaldyq saýattylyǵyn qalyptastyrýdaǵy krıterıaldy baǵalaýdyń róli //KazNPÝ ımenı Abaıa Vestnık. Serıia «Fızıko-matematıcheskıe naýkı». -Almaty. -2018. -№2(62). -S.181-187. (100%);

5. Informatıkadan oqýshylardyń fýnktsıonaldyq saýattylyǵyn baǵalaýda krıterıaldyq tásildi qoldanýdyń erekshelikteri //KazNPÝ ımenı Abaıa Vestnık. Serıia «Fızıko-matematıcheskıe naýkı». -Almaty. -2020. –№4(72). -S.212-219. (Co-authored by: Sagımbaeva A.E., Zaslavskaıa O.Iý., 60%);

6. Krıterıaldy tásil negizinde ınformatıkadan oqýshylardyń fýnktsıonaldyq saýattylyǵyn baǵalaý júıesiniń tıimdiligi //KazNPÝ ımenı Abaıa Vestnık. Serıia «Fızıko-matematıcheskıe naýkı». -Almaty. -2021. -№3(75). -S.205-211. (Co-authored by: Sagımbaeva A.E., 60%);

7. Krıterıalnyı podhod k otsenıvanııý ýchebnyh dostıjenıı v Respýblıke Kazahstan //Sbornık st. XI Mejdýnarodnoı naýchno-praktıcheskoı konferentsıı «Sovremennye vektory razvıtıia obrazova nıia: aktýalnye problemy ı perspektıvnye

reshenıia». -Moskva. -2019. -S.515-519. (Co-authored by:Sagımbaeva A.E., Zaslavskaıa O.Iý., 50%);

8. Bilim berý nátıjelerin krıterıaldy baǵalaý júıesi //Trýdy V Mejdýnarodnoı naýchno-praktıcheskoı konferentsıı «Intellektýalnye ınformatsıonnye ı kommýnıkatsıonnye tehnologıı sredstvo osýestvlenıia tretei ındýstralnoı revolıýtsıı v svete strategıı – «Kazahstan-2050»». -Astana, -2018. - S.63-65. (Co-authored by:: Sagımbaeva A.E., 60%);

9. Informatıkadan oqýshylardyń metapándik nátıjelerin baǵalaý máselesi // Materıaly VIII Mejdýnarodnoı naýchno-metodıcheskoı konferentsıı «Matematıches koe modelırovanıe ı ınformatsıonnye tehnologıı v obrazovanıı ı naýke».-Almaty. -2018. -S.411-413. (Co-authored by: Sagımbaeva A.E., 60%);

10. Qashyqtyqtan oqytý barysynda qalyptastyrýshy baǵalaýdy uıymdastyrý máseleleri //Materıaly IH Mejdýnarodnoı naýchno-metodıcheskoı konferentsıı «Matematıcheskoe modelırovanıe ı ınformatsıonnye tehnologıı v obrazovanıı ı naýke». -Almaty. -2020. -S.560-565. (Co-authored by: Sagımbaeva A.E., 60%);

11. Informatıkadan oqýshylardyń fýnktsıonaldyq saýattylyǵyn baǵalaý tapsyrmalary. Ýchebno-metodıcheskoe posobıe. -Almaty. -2021. -168s. ISBN 978-601-353-033-8 (Co-authored by: Sagımbaeva A.E., 60%).