

ANNOTATION

Dissertation on the topic "Methodical features of teaching the course of geometry in secondary school in conditions of updating the content of education" for the degree of Doctor of Philosophy (PhD) in the specialty "6D010900 – Mathematics"

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Research topic: Methodical features of teaching the course of geometry in secondary school in conditions of updating the content of education.

The aim of the research: to create a methodology for teaching a geometry course in a general secondary school in accordance with the updated educational content and to implement it in practice.

Research objectives:

- identification of the theoretical foundations of methodological research based on the analysis of foreign and domestic dissertations on the research problem;

- study of the significance and current state of teaching a geometry course in secondary schools, analysis of state compulsory education standards, curriculum and textbooks on geometry, identification of features of the updated content of geometric education;

- present methods, forms and means of organizing the educational process in geometry in the context of updated educational content, develop a methodology for teaching students to solve geometric problems;

- experimental testing of the effectiveness of the developed methodology and its implementation in the educational process.

Research methods.

In the implementation of research works, the following methods were used in a complex manner:

- analysis of philosophical, psychological, educational-methodological literature, Law "On Education" of the Republic of Kazakhstan, state mandatory standards of basic secondary, general secondary education, teaching programs, textbooks, educational tools and educational-methodical complexes for teaching geometry, geometry teaching practices on the topic of research;

- to make a comparative analysis of mathematical, methodological works and experience of teaching geometry, aimed at determining the features and common characteristics in the structure, content, and teaching methodology of geometry at different stages;

- generalization of pedagogical experience on the research problem; monitoring the teaching process, interviewing, surveying, testing; experimental

verification of the main theoretical positions and conclusions of the dissertation and processing of their results;

- discussion of research results in methodological seminars, scientific and practical conferences.

The main principles proposed for defense (proven scientific assumptions and other findings that are new knowledge):

- the place and importance of geometry education in general education schools, features of the geometry subject's educational content according to the updated program;

- the structure and content of the methodological system of teaching geometry based on the continuity and interdisciplinary connection of the content of geometric education in a general education school;

- methods, tools and ways of organizing students' educational activities in the process of teaching the geometry course according to the updated educational content, the methodology of teaching solving problems by various methods, and the results of experiments.

The main results of the study:

- the place and significance of geometric education in the school mathematics course, the stages of formation of geometric education, the structure and content features of the geometry course in secondary school have been identified;

- the continuity and interdisciplinary connection of teaching a geometry course at the level of basic secondary and general secondary education in the conditions of updated content of school education has been identified;

- teaching methods and forms of organizing the educational process in geometry are shown, the possibility of using computer programs is shown, methods are developed for teaching students to solve geometric problems in different ways in the context of updated educational content.

Novelty and significance of the results::

The validity of the first scientific result is proved by clarifying the place and importance of geometrical education in general education schools, periods of historical formation, structure and content features.

The validity of the second scientific result is based on the clarification of the continuity and interdisciplinary connection of teaching geometry at the basic secondary and general secondary education levels in accordance with the updated educational content of the school.

The validity of the third scientific result is proven by presenting methods of teaching geometry, ways of organizing the educational process, and the possibilities of using computer programs, and by suggesting the methodology of

teaching students how to solve geometric problems according to the updated educational content.

Compliance with the directions of science development or state programs:

The study was conducted in accordance with the requirements of educational development and normative documents in Kazakhstan, as well as the directions of scientific research: the Law of the Republic of Kazakhstan "On Education", the national project of quality education "Educated Nation", the development of preschool, secondary, technical and vocational education of the Republic of Kazakhstan concept for the years 2023-2029, general mandatory state standards of the basic secondary and general secondary education.

The contribution of the doctoral student in the preparation of each publication (indicate the share of the author of the dissertation, measured as a percentage of the total volume of the publication):

The total number of works published on the content of the dissertation work is 19, including 4 in scientific publications recommended by the Committee for Quality Assurance of Science and Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan, 8 in the collection of international scientific and practical conferences (Kazakhstan, Russia, Ukraine), 1 in collections and journals of republican scientific conferences, 2 in journals included in Scopus and Web of Science databases, 2 in foreign scientific journals, 2 educational materials.

In the framework of updating the content of secondary education, according to the geometry curriculum approved by the Ministry of Education and Science of the Republic of Kazakhstan, "Geometry: A collection of problems" educational tool (Almaty: Mektep, 2019. - 40 p.) was prepared for general education schools in Kazakh, Russian, Uyghur and Uzbek languages, and students of the country's major schools are studying with this tool.

All publications were prepared during the course of research.

In a scientific journals indexed by Scopus and Web of Science databases:

1. Modernization of the system of continuous natural science education in the Republic of Kazakhstan // AD ALTA: Journal of Interdisciplinary Research. - Czech Republic. – Volum 8, Issue 1, Issue IV. – 2018. – P.86-92. (Web of Science). Q3. (Co-authored by: Sh.Shuinshina, Y.Alpeissof, Y.Tuyakov, L.Zhanseitova), doctoral student's contribution to the publication 60%.

2. Mathematical Problems as a Means of Developing Students' Research Skills in the Context of School Education Content Updating // Journal of Law and sustainable Development. - Vol. 11. - No. 4 (2023). - Pages: 01-20. (Scopus, процентиљ 39). (Co-authored by: A.Abylkassymova, A.Bazhi, M.Dyussov,

L.Zhadrayeva, Y.Tuyakov, Kh.Kenzhebek.) doctoral student's contribution to the publication 50%.

In publications recommended by the Committee on Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan:

1. Үздіксіз білім беру деңгейлері арасындағы мазмұн сабақтастығы // L.N. Gumilev Eurasian National University. Humanities Series. - №5 (120). – 2017. – P.177-181. (Co-authored by: Mubarakov A.M., Kopeev Zh.B.) doctoral student's contribution to the publication 70%.

2. Орта мектептегі геометриялық білім беру мазмұнының кейбір аспектілері // Bulletin of PSU, Pedagogical series. - №2. – 2020. Б. 27-38. (Co-authored by: Abilkasymova A.E.) doctoral student's contribution to the publication 80%.

3. Жаңартылған білім мазмұны жағдайында геометрияны оқытудың қолданбалы бағытын жүзеге асыру жолдары // «Қазақстанның ғылымы мен өмірі – Наука и жизнь Казахстана» халықаралық ғылыми журналы. - №2. – 2020. – Б.77-83. (Co-authored by: Тұяқов Е.А., Дюсов М.С.) doctoral student's contribution to the publication 60%.

4. Макнемар критерийі және оны педагогикалық құбылыстарды зерттеуде қолдану // Абай атындағы ҚазҰПУ-нің хабаршысы. «Физика-математика ғылымдары» сериясы. - №1(81). - 2023. – Б.99-105. (Co-authored by: Қосанов Б.М.). doctoral student's contribution to the publication 70%.

Scientific papers published in scientific journals:

1. Methodical Aspects of Pupils’ Teaching to Solve Mathematical Tasks // International Journal of Advanced Science and Technology. Vol. 29, No. 4s, (2020) (Special Issue). ISSN: 2005-4238, E-ISSN: 2207-6360. -pp. 2440-2452. (Co-authored by: A.E.Abylkassymova, Y.A.Tuyakov, R.M.Kaparova, M.S.Dyussov, L.Zh.Zhanseitova) doctoral student's contribution to the publication 40%.

2. К вопросу об исследовании решений задач в школьном курсе геометрии // СДУ хабаршысы. – 2017. - №4 (43). – Б.142-148. (Co-authored by: Дюсов М.С., Басымбекова А.Т.). Вклад докторанта в публикацию 60%.

3. Methods of teaching geometry in the framework of the updated curriculum in mainstream education // Cypriot Journal of Educational Sciences. – Volume 17(9). – 2022. – P.3568–3577. <https://doi.org/10.18844/cjes.v17i9.8135>. (Co-authored by: Abylkassymova A., Shuakayev M., Tuyakov Y., Zhumaliyeva L., Khyrkhynbay Z.). doctoral student's contribution to the publication 70%.

Materials of the international scientific and practical conference

1. Оқушыларды геометриялық есептерді шығаруға үйретуде компьютерлік бағдарламаларды қолданудың тиімділігі // «Үздіксіз педагогикалық білім беру мәселелері: дәстүр және инновациялар» Еуразиялық педагогикалық университеттер қауымдастығының халықаралық форумы. – Алматы, Абай атындағы ҚазҰПУ, 2018. – Б.292-296. (Co-authored by: Жансеитова Л.Ж.). doctoral student's contribution to the publication 70%.

2. Жаңартылған білім беру мазмұны аясында математикадан оқушылардың функционалдық сауаттылығын дамыту // «Білім берудегі инновациялар: ізденіс және шешімдер» V Халықаралық ғылыми-практикалық конференция материалдары. – Астана: Ы. Алтынсарин атындағы ҰБА, 2018. – Б. 687-689. (Co-authored by: Танатова А.С.). doctoral student's contribution to the publication 80%.

3. Студенттердің білімін қашықтықтан оқытуда бақылау және бағалау // «XXI Сәтбаев оқулары» Жас ғалымдар, магистранттар, студенттер мен мектеп оқушыларының: халықар. ғыл. конф. материалдары. - 18 том. – Павлодар: Toraighyrov University, 2021. – Б.31-35. (Co-authored by: Жансеитова Л.Ж., Беркін Л.М.). doctoral student's contribution to the publication 70%.

4. К вопросу об обучении геометрии в школе в условиях цифровизации образования // Материалы международной научно-практической интернет-конференции «Тенденции и перспективы развития науки и образования в условиях глобализации». – Переяслав, 2021. - Вып. 67. – С.169-172. Co-authored by: Жансеитова Л.Ж.). doctoral student's contribution to the publication 70%.

5. Составление геометрических задач как средство формирования математической компетентности учащихся // Материалы VII Международной научно-практической конференции «Актуальные проблемы обучения математике в школе и вузе: от науки к практике» . – Москва, МПГУ, 2022. – С.110-119. (Co-authored by: Каскатаева Б.Р., Туяков Е.А.). doctoral student's contribution to the publication 70%.

6. О новом учебно-методическом комплекте по геометрии для 7-11 классов // Материалы международной научно-практической конференции «Актуальные проблемы обучения математике и физике в школе и вузе в условиях обновленного содержания образования». – Алматы: КазНПУ имени Абая, издательство «Ұлағат», 2022. – С.40-43. (Co-authored by: Смирнов В.А.). doctoral student's contribution to the publication 80%.

7. Заманауи білім берудегі қашықтықтан оқыту технологиялары // Материалы Международной научно-практической конференции «Актуальные проблемы обучения математике и физике в школе и вузе в условиях обновленного содержания образования». – Алматы: КазНПУ им.

Абая, издательство «Ұлағат», 2022. - С. 409-411. (Co-authored by: Жансеитова Л.Ж.) doctoral student's contribution to the publication 70%.

8. Геометрия сабақтарында оқушылардың оқу іс-әрекетін ұйымдастыру әдістемесі // «Жаңа Қазақстан жағдайындағы педагогикалық білім беруді жаңғырту: теориялық және қолданбалы аспектілері» атты халықаралық ғылыми-практикалық конференция материалдарының жинағы. – Павлодар: ППУ, 2022. – Б.735-740. (Co-authored by: Тугелбаева Ф.Б.) doctoral student's contribution to the publication 80%.

Educational-methodical, teaching aids:

1. Геометрия: Есептер жинағы. Жалпы білім беретін мектептің 9-сыныбына арналған оқу құралы, – Алматы: Мектеп, 2019. – 40 б. (Co-authored by: Дюсов М.С.) doctoral student's contribution to the publication 60%.

2. Геометрия: Сборник задач. Учебное пособие для 9 класса общеобразовательных школ. – Алматы: Мектеп, 2019. – 40с. (Co-authored by: Дюсов М.С.) doctoral student's contribution to the publication 60%.