

MUHAMMAD AL-XORAZMIY
NOMIDAGI TATU FARG'ONA FILIALI
FERGANA BRANCH OF TUIT
NAMED AFTER MUHAMMAD AL-KHORAZMI

“AL-FARG'ONIY AVLODLARI”

ELEKTRON ILMIY JURNALI | ELECTRONIC SCIENTIFIC JOURNAL

TA'LIMDAGI ILMIY, OMMABOP VA ILMIY TADQIQOT ISHLARI



2-SON 1(2)
2023-YIL

TATU, FARG'ONA
O'ZBEKISTON



O'ZBEKISTON RESPUBLIKASI RAQAMLI TEXNOLOGIYALAR VAZIRLIGI

MUHAMMAD AL-XORAZMIY NOMIDAGI
TOSHKENT AXBOROT TEXNOLOGIYALARI UNIVERSITETI
FARG'ONA FILIALI

Muassis: Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti Farg'ona filiali.

Chop etish tili: O'zbek, ingliz, rus. Jurnal texnika fanlariga ixtisoslashgan bo'lib, barcha shu sohadagi matematika, fizika, axborot texnologiyalari yo'nalishida maqolalar chop etib boradi.

Учредитель: Ферганский филиал Ташкентского университета информационных технологий имени Мухаммада ал-Хоразми.

Язык издания: узбекский, английский, русский.

Журнал специализируется на технических науках и публикует статьи в области математики, физики и информационных технологий.

Founder: Fergana branch of the Tashkent University of Information Technologies named after Muhammad al-Khorazmi.

Language of publication: Uzbek, English, Russian.

The magazine specializes in technical sciences and publishes articles in the field of mathematics, physics, and information technology.

2023 yil, Tom 1, №2
Vol.1, Iss.2, 2023 y

ELEKTRON ILMIY JURNALI

ELECTRONIC SCIENTIFIC JOURNAL

«Al-Farg'oniylar avlodlari» («The descendants of al-Fargani», «Potomki al-Fargani») O'zbekiston Respublikasi Prezidenti administratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligida 2022-yil 21 dekabrda 054493-son bilan ro'yxatdan o'tgan.

Tahririyat manzili:

151100, Farg'ona sh., Aeroport ko'chasi 17-uy, 201A-xona

Tel: (+99899) 998-01-42

e-mail: info@al-fargoniy.uz

Qo'lyozmalar taqrizlanmaydi va qaytarilmaydi.

FARG'ONA - 2023 YIL

TAHRIR HAY'ATI

Maxkamov Baxtiyor Shuxratovich,
Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti rektori, iqtisodiyot fanlari doktori, professor

Muxtarov Farrux Muhammadovich,
Muhammad al-Xorazmiy nomidagi Toshkent axborot texnologiyalari universiteti Farg'ona filiali direktori, texnika fanlari doktori

Arjannikov Andrey Vasilevich,
Rossiya Federatsiyasi Sibir davlat universiteti professori, fizika-matematika fanlari doktori

Satibayev Abdugani Djunosovich,
Qirg'iziston Respublikasi, Osh texnologiyalari universiteti, fizika-matematika fanlari doktori, professor

Rasulov Akbarali Maxamatovich,
Axborot texnologiyalari kafedrasida professori, fizika-matematika fanlari doktori

Yakubov Maksadxon Sultaniyazovich,
TATU «Axborot texnologiyalari» kafedrasida professori, t.f.d., professor, xalqaro axborotlashtirish fanlari Akademiyasi akademigi

Bo'taboyev Muhammadjon To'ychiyevich,
Farg'ona politexnika instituti, Iqtisod fanlari doktori, professor

Abdullayev Abdujabbor,
Andijon mashinosozlik instituti, Iqtisod fanlari doktori, professor

Qo'ldashev Abbasjon Hakimovich,
O'zbekiston milliy universiteti huzuridagi Yarimo'tkazgichlar fizikasi va mikroelektronika ilmiy-tadqiqot instituti, texnika fanlari doktori, professor

Ergashev Sirojiddin Fayazovich,
Farg'ona politexnika instituti, elektronika va asbobsozlik kafedrasida professori, texnika fanlari doktori, professor

Qoraboyev Muhammadjon Qoraboievich,
Toshkent tibbiyot akademiyasi Farg'ona filiali fizika matematika fanlari doktori, professor, BMT ning maslahatchisi maqomidagi xalqaro axborotlashtirish akademiyasi akademigi

Naymanboyev Raxmonali,
TATU FF Telekommunikatsiya kafedrasida faxriy dotsenti

Polvonov Baxtiyor Zaylobiddinovich,
TATU FF Ilmiy ishlar va innovatsiyalar bo'yicha direktor o'rinbosari

Zulunov Ravshanbek Mamatovich,
TATU FF «Dasturiy injiniringi» kafedrasida dotsenti, fizika-matematika fanlari nomzodi

Saliyev Nabijon,
O'zbekiston jismoniy tarbiya va sport universiteti Farg'ona filiali dotsenti

G'ulomov Sherzod Rajaboyevich,
TATU Kiberxavfsizlik fakulteti dekani, Ph.D., dotsent

G'aniyev Abduxalil Abdujalioviyich,
TATU Kiberxavfsizlik fakulteti, Axborot xavfsizligi kafedrasida t.f.n., dotsent

Zaynidinov Hakimjon Nasritdinovich,
TATU Kompyuter injiniringi fakulteti, Sun'iy intellekt kafedrasida texnika fanlari doktori, professor

Abdullaev Temurbek Marufovich,
Kafedra mudiri, texnika fanlar bo'yicha falsafa doktori

Bilolov Inomjon O'ktamovich,
Kafedra mudiri, pedagogika fanlar nomzodi

Daliev Baxtiyor Sirojiddinovich,
Fakultet dekani, fizika-matematika fanlari bo'yicha falsafa doktori

Zokirov Sanjar Ikromjon o'g'li,
Kafedra mudiri, fizika-matematika fanlari bo'yicha falsafa doktori

Ibroximov Nodirbek Ikromjonovich,
Dasturiy injiniring va raqamli iqtisodiyot fakulteti dekani, fizika-matematika fanlari bo'yicha PhD

Kochkorova Gulnora Dexkanbaevna,
Kafedra mudiri, falsafa fanlari nomzodi

Kadirov Abdumalik Matkarimovich,
Yoshlar masalalari va ma'naviy-ma'rifiy ishlar bo'yicha direktor o'rinbosari, falsafa fanlar bo'yicha falsafa doktori

Nurdinova Raziya Abdixalikovna,
Ilmiy tadqiqotlar, innovatsiyalar va ilmiy-pedagogik kadrlar tayyorlash bo'limi boshlig'i, texnika fanlari bo'yicha falsafa doktori

Otakulov Oybek Hamdamovich,
Kompyuter injiniringi fakulteti dekani, texnika fanlar nomzodi, dotsent

Obidova Gulmira Kuziboevna,
Kafedra mudiri, falsafa fanlari doktori

Rayimjonova Odinaxon Sodiqovna,
Kafedra mudiri, texnika fanlari bo'yicha falsafa doktori (PhD), dotsent

Sabirov Salim Satiyevich,
Kafedra mudiri, fizika-matematika fanlari nomzodi, dotsent

Teshaboev Muhiddin Ma'rufovich,
Ta'lim sifatini nazorat qilish bo'limi boshlig'i, falsafa fanlari bo'yicha falsafa doktori

To'xtasinov Dadaxon Farxodovich,
Kafedra mudiri, pedagogika fanlari bo'yicha falsafa doktori (PhD)

Jurnal quyidagi bazalarda indekslanadi:



MUNDARIJA | ОГЛАВЛЕНИЕ | TABLE OF CONTENTS

Farrux Muxtarov, MAXSUS AXBOROT ALMASHUV KANALLARIGA BO'LADIGAN XAVF-XATARLARNI ANIQLASH, VAHOLASH VA BOSHQARISH HAMDA ULARNI BARTARAF ETISH USULLARINI ISHLAB CHIQUISH	5-8
Muhammadmullo Asrayev, 0-TARTIBLI BIR JINSLI FUNKSIONALLAR KO'RINISHIDAGI SODDA MEZONLAR UCHUN 1 INFORMATIV BELGILAR MAJMUASINI ANIQLASH USULLARI	9-12
Musoxon Dadaxonov, Muhammadmullo Asrayev, BERILGAN TASVIR SIFATINI VAHOLASH	13-16
Узоков Бархаёт Мухаммадиевич, АДАПТАЦИЯ МОДЕЛЕЙ ОПЕРАТИВНОГО УПРАВЛЕНИЯ ТЕХНОЛОГИЧЕСКИМИ ПРОЦЕССАМИ ПО ТЕХНИКО-ЭКОНОМИЧЕСКИМ ПОКАЗАТЕЛЯМ	17-22
Mirzakarimov Baxtiyor Abdusalomovich, Kayumov Ahror Muminjonovich, THE CHALLENGES OF TEACHING JAVA PROGRAMMING LANGUAGE IN EDUCATIONAL SYSTEMS	23-26
Якубов М.С., Хошимов Б.М., АНАЛИЗ СОВРЕМЕННЫХ МЕТОДОВ ОПРЕДЕЛЕНИЕ ПОКАЗАТЕЛЕЙ КАЧЕСТВА НЕФТЕПРОДУКТОВ	27-32
Mirzakarimov Baxtiyor Abdusalomovich, Xayitov Azizjon Mo'minjon o'g'li, THE USE OF BIOMETRIC AUTHENTICATION TECHNIQUES FOR SAFEGUARDING DATA IN COMPUTER SYSTEMS AGAINST UNAUTHORIZED ACCESS OR BREACHES	33-36
Zulunov Ravshan Mamatovich, Kayumov Ahror Muminjonovich, THE LIMITATIONS OF TEACHING JAVA PROGRAMMING LANGUAGE IN EDUCATIONAL SYSTEMS	37-40
D.X.Tojimatov, KIBER TAHDIDLARNI BASHORAT QILISH VA XAVF-XATARLARDAN NIHOYALANISHDA SUN'IY INTELEKT IMKONIYATLARIDAN FOYDALANISH	41-44
Хаджаев С.И., АСИНХРОННАЯ БИБЛИОТЕКА PYTHON ASYNCIO: ПРЕИМУЩЕСТВА И ПРИМЕРЫ ПРИМЕНЕНИЯ	45-48
Kayumov Ahror Muminjonovich, CREATING AN EXPERT SYSTEM-BASED PROGRAM TO EVALUATE TEXTILE MACHINE EFFECTIVENESS	49-52
Zulunov Ravshanbek Mamatovich, Mahmudova Muqaddasxon Abdubannob qizi, TIBBIYOT MUASSASALARIDA ELEKTRON NAVBAT TIZIMI	53-57
Зулунов Равшанбек Маматович, Гуламова Диёра Ифтихар қизи, РЕЧЕВОЙ СИГНАЛ И ЕГО НОРМАЛИЗАЦИЯ	58-60
Солиев Баҳромжон Набижонович, ГЕНЕРАЦИЯ АВТОМАТИЧЕСКОЙ ДОКУМЕНТАЦИИ API В DJANGO REST FRAMEWORK С ПРИМЕНЕНИЕМ DRF SPECTACULAR	61-66
Эрматова Зарина Кахрамоновна, АЛЬТЕРНАТИВНЫЕ ПОДХОДЫ К ОБРАБОТКЕ ОШИБОК: СРАВНЕНИЕ EXCEPTIONS И STD::EXPECTED В C++	67-73

THE CHALLENGES OF TEACHING JAVA PROGRAMMING LANGUAGE IN EDUCATIONAL SYSTEMS

Mirzakarimov Baxtiyor Abdusalomovich,
PhD professor,

Fergana branch of the Tashkent university of information
technologies named after Muhammad al-Khorazmi

Kayumov Ahror Muminjonovich,
teacher, 3293535ahror@gmail.com

Fergana branch of the Tashkent university of information
technologies named after Muhammad al-Khorazmi

Abstract: Teaching Java programming language in educational systems poses several challenges for both educators and students. Java is a complex programming language with a steep learning curve that requires extensive practice and hands-on experience to master. Furthermore, teaching advanced concepts and techniques, such as multithreading and memory management, can be difficult, and the limited availability of qualified and experienced Java instructors can hinder the quality of education. The lack of interactivity, visual aids, and multimedia features can also limit student engagement and motivation

Keywords: Java, programming language, education, challenges, limitations, complexity, steep learning curve, hands-on experience, advanced concepts, multithreading, memory management, qualified instructors, tools, environments, flexibility, adaptability, syntax, grammar, interactive resources, multimedia, practical applications, real-world projects, collaboration, industry professionals, digital economy

Introduction. Java programming language is one of the most popular and widely used programming languages in the world. It was created in 1995 by James Gosling at Sun Microsystems and has since been acquired by Oracle Corporation. Java is a high-level, object-oriented programming language that is platform-independent, meaning it can run on any operating system without requiring any changes to the code. Java is used to develop a wide range of applications, including web applications, mobile applications, desktop applications, and enterprise software. Its popularity is due to its simplicity, reliability, security, and scalability[1]. Additionally, Java has a vast and active developer community, with numerous libraries, frameworks, and tools available for developers to use. Due to its widespread adoption, proficiency in Java is a valuable skill for programmers and is often required for many jobs in the software development industry.

Teaching Java programming language presents various challenges and limitations that can affect student learning outcomes and program effectiveness, despite its many advantages. Some of these challenges

include the complexity of the language and steep learning curve for beginners, the need for extensive practice and hands-on experience, difficulty in teaching advanced concepts and techniques, and limited availability of qualified and experienced instructors. Additionally, Java's dependence on specific tools and environments, limited flexibility and adaptability, and overemphasis on syntax and grammar can hinder student engagement and creativity. These issues need to be addressed through the use of interactive and multimedia resources, integration of other programming languages and frameworks, emphasis on practical applications and real-world projects, and collaboration with industry professionals. By addressing these challenges and limitations, we can promote more effective and inclusive Java education and better prepare students for the demands of the digital economy[2].

Literature review and methodology. Literature Review: Java is a widely used programming language for developing enterprise applications, web applications, and mobile applications. It is widely used in educational settings to teach programming to

beginners due to its object-oriented programming principles, platform independence, and ease of use. However, teaching Java programming language in educational settings can be challenging and have limitations. Several studies have investigated the challenges and limitations of teaching Java programming in educational settings.

One of the main challenges identified in the literature is the steep learning curve for beginners. Java has a complex syntax, and beginners may struggle to understand the fundamental concepts of object-oriented programming. Another challenge is that Java is an evolving language, and keeping up with the latest updates and features can be difficult for educators. The limitations of Java in educational settings include the lack of interactivity, visual aids, and multimedia features that are required to keep learners engaged and motivated.

Methodology: To investigate the challenges and limitations of teaching Java programming in educational settings, a qualitative research design will be used. Data will be collected through semi-structured interviews with Java programming instructors and educators who have experience teaching Java programming in educational settings. The participants will be selected based on their expertise and experience in teaching Java programming, and a purposive sampling technique will be used to select participants.

The data collected from the interviews will be analyzed using thematic analysis. The transcripts of the interviews will be reviewed, and common themes and patterns will be identified. The themes will be categorized into sub-themes, and the data will be triangulated to ensure the validity and reliability of the findings.

The study's findings will contribute to the body of knowledge on the challenges and limitations of teaching Java programming in educational settings. The results can be used to develop effective teaching strategies and materials that address the identified challenges and limitations. The study's limitations include the small sample size and the subjective nature of the data collected through the interviews.

Results. Challenges in teaching Java programming language. Complexity of a language and its learning curve for beginners depend on various factors such as the language's grammar, syntax, vocabulary, and writing system. Some languages may be more challenging to learn than others due to their

structural differences or lack of familiarity with their writing systems[3].

For example, languages like Chinese, Arabic, and Japanese have different writing systems than the Latin alphabet commonly used in Western languages, which can make it challenging for beginners to learn to read and write. Similarly, languages with complex grammatical rules such as Russian, Latin, or German can be more difficult to master than those with simpler grammatical structures like English or French.

In general, the complexity of a language and its learning curve can be mitigated through effective teaching methods and materials, such as clear explanations, well-structured lessons, and ample opportunities for practice and feedback. It's also essential to approach language learning with patience, persistence, and a willingness to make mistakes and learn from them.

Java programming requires extensive practice and hands-on experience to master it effectively. Java is a widely used and versatile programming language used for developing a wide range of applications such as desktop, web, mobile, and enterprise software.

To become proficient in Java programming, beginners need to learn the language's syntax, data types, control structures, object-oriented programming concepts, and common libraries and frameworks. They also need to practice writing code, debugging errors, and optimizing performance.

One effective way to gain hands-on experience in Java programming is to work on real-world projects that simulate the challenges and requirements of professional software development. This allows beginners to practice coding skills in a realistic environment, collaborate with other developers, and gain insights into the software development life cycle[4].

Another way to practice Java programming is to participate in coding challenges, competitions, and online communities that provide feedback and opportunities to learn from experienced developers. It's also essential to keep up with the latest trends and updates in Java technology and continuously improve coding skills through reading books, attending conferences, and taking online courses.

The teaching of advanced concepts and techniques in Java programming, such as multithreading and memory management, can be challenging for educators due to their complexity and technical nature. These concepts require a deep

understanding of the language and its features and may be difficult for students to grasp without the appropriate level of prior knowledge and experience.[5]

Multithreading, for example, is a technique used to allow multiple threads of execution within a single program. It can be challenging to teach because it requires a thorough understanding of concurrency, synchronization, and communication between threads. Moreover, the improper use of multithreading can lead to errors, such as race conditions and deadlocks, which can be challenging to debug.

Memory management is another advanced concept in Java programming that can be challenging to teach. In Java, memory management is done automatically by the garbage collector, which frees up memory for objects that are no longer needed. However, understanding the underlying concepts of memory management, such as the stack and the heap, can be difficult for students without a background in computer science[6].

To teach these advanced concepts effectively, educators can use a variety of teaching methods, such as lectures, demonstrations, and hands-on exercises. They can also provide examples of real-world applications that use these concepts and provide students with opportunities to practice implementing them. Additionally, educators can use visual aids, such as diagrams and animations, to help students visualize complex concepts and techniques.[7]

Overall, teaching advanced concepts and techniques in Java programming requires educators to have a deep understanding of the language and its features and to use effective teaching methods to help students understand these complex topics.

The limited availability of qualified and experienced Java instructors can be a significant challenge in educational settings.[9] Java is a complex programming language that requires a high level of expertise and experience to teach effectively. The scarcity of qualified and experienced instructors can hinder the quality of education and limit the number of students who can learn Java programming.

One of the reasons for the limited availability of qualified and experienced Java instructors is the demand for experienced Java developers in the job market. Many experienced Java developers prefer to work in the industry, where they can earn higher salaries and have more opportunities for career growth and development. As a result, there is a shortage of

qualified and experienced Java instructors in educational settings.[11-12]

Another reason is the lack of training and professional development opportunities for educators. Many educators may have the required technical skills but may not have the necessary teaching skills and experience to teach Java programming effectively. Providing training and professional development opportunities for educators can help to improve the quality of education and increase the number of qualified and experienced Java instructors.[13]

To address this challenge, educational institutions can collaborate with industry partners to provide training and professional development opportunities for educators. They can also offer incentives such as higher salaries, flexible work schedules, and opportunities for career growth and development to attract and retain qualified and experienced Java instructors[8].

Additionally, educational institutions can use online resources, such as online courses, tutorials, and forums, to supplement classroom instruction and provide students with access to a broader range of resources and expertise. This can help to mitigate the shortage of qualified and experienced Java instructors and provide students with quality education in Java programming[10].

Conclusion. Teaching Java programming language in educational systems can be challenging due to the complexity of the language, the need for extensive practice and hands-on experience, and the limited availability of qualified and experienced instructors. Educators face difficulties in teaching advanced concepts and techniques, such as multithreading and memory management, which require a deep understanding of the language and its features. Additionally, the lack of interactivity, visual aids, and multimedia features can limit student engagement and motivation.

To overcome these challenges, educators can use a variety of teaching methods, such as lectures, demonstrations, and hands-on exercises, to help students understand complex topics. Access to online resources, including online courses, tutorials, and forums, can also supplement classroom instruction and provide students with a broader range of resources and expertise.

Educational institutions can collaborate with industry partners to provide training and professional development opportunities for educators and offer

incentives to attract and retain qualified and experienced Java instructors. By addressing these challenges, educators can provide students with quality education in Java programming and prepare them for success in their careers.

References:

1. Azizjon Mo'minjon o'g X. et al. The Importance of Mathematical Game and Methods in the Formation of Mathematical Concepts in Primary Schools //Journal of Pedagogical Inventions and Practices. – 2022. – Т. 8. – С. 208-211.
2. Холматов А. А. У., Хайитов А. М. Ў. ИЗУЧИТЬ И ИЗУЧИТЬ СВОЙСТВА БАРИЯ И СТРОНЦИЯ-ТИТАНА, СИНТЕЗИРОВАННЫХ В БОЛЬШОЙ СОЛНЕЧНОЙ ПЕЧИ //Oriental renaissance: Innovative, educational, natural and social sciences. – 2021. – Т. 1. – №. 11. – С. 79-93.
3. Xolmatov A. A., Karimov J. X., Xayitov A. M. Effect of crystallizer catalyst on properties of glass-crystalline materials //EPRA International Journal of Research and Development (IJRD). – 2021. – С. 273-275.
4. Muminjonovich, K. A. (2023). SUN'YIY INELLEKTNI RIVOJLANTIRISHDA DASTURLASH TILLARINING RO 'LI. Journal of new century innovations, 12(4), 159-161.
5. Kayumov, A. (2023). THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE EDUCATIONAL PROCESS. Потомки Аль-Фаргани, 1(1), 35-38.
6. Olim, O., & Mokhichkehra, B. (2022). FEATURES OF MULTIPARTY SYSTEM IN UZBEKISTAN AND TURKEY: COMPARATIVE ANALYSIS. Web of Scientist: International Scientific Research Journal, 3(10), 1312-1321.
7. Ionin A. A. et al. Lasers on overtone transitions of carbon monoxide molecule //Laser Physics. – 2010. – Т. 20. – С. 144-186.
8. KONEV, Y., KOCHETOV, I., KURNOSOV, A., & MIRZAKARIMOV, B. (1994). CALCULATION OF CO LASER KINETICS WITH ALLOWANCE FOR MULTIPHOTON VV EXCHANGE. KVANTOVAYA ELEKTRONIKA, 21(2), 133-136.
9. Musayev, X., & Soliev, B. (2023). PUBLIC, PROTECTED, PRIVATE MEMBERS IN PYTHON. Потомки Аль-Фаргани, 1(1), 43–46. извлечено от <https://al-fargoniy.uz/index.php/journal/article/view/17>
10. Zulunov, R., & Soliev, B. (2023). IMPORTANCE OF PYTHON LANGUAGE IN DEVELOPMENT OF ARTIFICIAL INTELLIGENCE. Потомки Аль-Фаргани, 1(1), 7–12. извлечено от <https://al-fargoniy.uz/index.php/journal/article/view/3>
11. R. Zulunov, D.Irmatova. Sun'iy intellekt texnologiyalaridan foydalanish. The journal of integrated education and research, 1(6), November 2022, p.53-56.
12. Асраев, М., Собир, Р., & Dadakhanov, М. (2023). ОСОБЕННОСТИ ОБРАБОТКИ И АНАЛИЗА ИЗОБРАЖЕНИЙ РУКОПИСНОГО ВВОДА. Потомки Аль-Фаргани, 1(1). извлечено от <https://al-fargoniy.uz/index.php/journal/article/view/15>
13. Musayev X.SH., Ermatova Z.Q., KOTLIN DASTURLASH TILIDA KORUTINLAR BILAN ISHLASHNI TALABALARGA O 'RGATISH //Journal of Integrated Education and Research. – 2022. – Т. 1. – №. 6. – С. 119-125.
14. Ogli K. A. M. MODERN PROGRAMMING LANGUAGES: CLASSIFICATION AND CHARACTERIZATION //International Journal of Advance Scientific Research. – 2022. – Т. 2. – №. 11. – С. 108-111.