



ISSN: 3060-4613



MAKTABGACHA
VA MAKTAB
TA'LIMI VAZIRLIGI



O'zbekiston
Milliy Pedagogika
Universiteti



No5(5)
2026

- 13.00.00 Pedagogika fanlari
- 13.00.01 Pedagogika nazariyasi. Pedagogik ta'limotlar tarixi
- 13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
- 13.00.03 Maxsus pedagogika
- 13.00.04 Jismoniy tarbiya va sport mashg'ulotlari nazariyasi va metodikasi
- 13.00.05 Kasb-hunar ta'limi nazariyasi va metodikasi
- 13.00.06 Elektron ta'lim nazariyasi va metodikasi (ta'lim sohaları va bosqichlari bo'yicha)
- 13.00.07 Ta'limda menejment
- 13.00.08 Maktabgacha ta'lim va tarbiya nazariyasi va metodikasi
- 13.00.09 Ijtimoiy pedagogika
- 07.00.00 Tarix fanlari
- 19.00.00 Psixologiya fanlari
- 01.00.00 Fizika-matematika fanlari
- 02.00.00 Kimyo fanlari
- 03.00.00 Biologiya fanlari
- 09.00.00 Falsafa fanlari
- 10.00.00 Filologiya fanlari
- 11.00.00 Geografiya fanlari

M

AKTABGACHA VA AKTAB TA'LIMI

Pedagogika, psixologiya fanlariga ixtisoslashgan ilmiy jurnal



MAKTABGACHA VA MAKTAB TA'LIMI



Elektron nashr. 716 sahifa,
22-may, 2026-yil.

BOSH MUHARRIR:

Karimova E'zoza Gapijanovna – O'zbekiston Respublikasi Maktabgacha va maktab ta'limi vaziri

BOSH MUHARRIR O'RINBOSARI:

Ibragimova Gulsanam Ne'matovna – Pedagogika fanlari doktori, professor

TAHRIRIYAT KENGASHI A'ZOLARI

Ibragimov X.I. – pedagogika fanlari doktori, akademik
Shoumarov G'.B. – psixologiya fanlari doktori, akademik
Qirg'izboyev A.K. – Tarix fanlari doktori, professor
Jamoldinova O.R. – pedagogika fanlari doktori, professor
Sharipov Sh.S. – pedagogika fanlari doktori, professor
Shermuhhammadov B.Sh. – pedagogika fanlari doktori, professor
Ma'murov B.B. – pedagogika fanlari doktori, professor
Madraximova F.R. – pedagogika fanlari doktori, professor
Kalonov M.B. – iqtisodiyot fanlari doktori, professor
Nabiyev D.X. – iqtisodiyot fanlari doktori, professor
Qo'ldoshev Q. M. – iqtisodiyot fanlari doktori, professor
Ikramxanova F.I. – filologiya fanlari doktori, professor
Ismagilova F.S. – psixologiya fanlari doktori, professor (Rossiya)
Stoyuxina N.Yu. – psixologiya fanlari nomzodi, dotsent (Rossiya)
Magauova A.S. – pedagogika fanlari doktori, professor (Qozog'iston)
Rejep O'zyurek – psixologiya fanlari doktori, professor (Turkiya)
Wookyu Cha – Koreya milliy ta'lim universiteti rektori (Koreya)
Polonnikov A.A. – psixologiya fanlari nomzodi, dotsent (Belarus)
Mizayeva F. O. – Pedagogika fanlari doktori, dotsent
Baybayeva M.X. – pedagogika fanlari doktori, professor
Muxsiyeva A.T. – pedagogika fanlari doktori, professor
Aliyev B. – falsafa fanlari doktori, professor
Abdullayeva N. Sh. – Pedagogika fanlari doktori (DSc), professor
Doniyorov S. M. – “Yangi O'zbekiston” va “Pravda Vostoka” gazetalari tahririyati DM bosh muharriri, O'zbekiston Respublikasida xizmat ko'rsatgan jurnalist, filologiya fanlari bo'yicha falsafa doktori (PhD), dotsent
G'afurov D. O. – falsafa fanlari doktori (PhD)
Shomurodov R.T. – iqtisodiyot fanlari nomzodi (PhD), dotsent
Mirzayeva F. O. – pedagogika fanlari doktori (DSc), dotsent
Jalilova S.X. – psixologiya fanlari nomzodi (PhD), dotsent
Bafayev M.M. – psixologiya fanlari bo'yicha falsafa doktori (PhD), dotsent
Usmonova D.I. – Samarqand iqtisodiyot va servis institute dotsenti
Saifnazarov I. – falsafa fanlari doktori, professor
Nematov Sh.E. – pedagogika fanlari nomzodi (PhD)
Tillashayxova X.A. – psixologiya fanlari nomzodi (PhD), dotsent
Yuldasheva F.I. – pedagogika fanlari bo'yicha falsafa doktori (PhD), dotsent
Yuldasheva D.B. – filologiya fanlari bo'yicha falsafa (PhD) doktori, dotsent
Tangriyev A. T. – Toshkent davlat iqtisodiyot universiteti kafedra professori
Ashurov R. R. – psixologiya fanlari bo'yicha falsafa doktori (PhD), dotsent
Panjiyev M. A. – Qashqadaryo viloyati Maktabgacha va maktab ta'limi boshqarmasi boshlig'ining birinchi o'rinbosari
Xudayberganov N. A. – Xorazm Ma'mun akademiyasi Tabiiy fanlar bo'limining katta ilmiy xodimi, biologiya fanlari bo'yicha falsafa doktori (PhD)
Vaxobov Anvar Abdusattor o'g'li – Pedagogika fanlari bo'yicha falsafa doktori, dotsent

Muassis: “Tadbirkor va ishbilarmon” MChJ

Hamkorlarimiz: O'zbekiston Respublikasi Maktabgacha va maktab ta'limi vazirligi, O'zbekiston milliy pedagogika universiteti

EDITOR-IN-CHIEF:

Karimova E'zoza Gapirzhanovna – Minister of Perschool and School Education of the Republic of Uzbekistan

DEPUTY EDITOR-IN-CHIEF:

Ibragimova Gulsanam Ne'matovna – Doctor of Pedagogical Sciences, Professor

EDITORIAL BOARD MEMBERS:

Ibragimov X.I. – Doctor of Pedagogical Sciences, Academician

Shoumarov G. B. – Doctor of Psychological Sciences, Academician

Qirg'izboyev A. K. – Doctor of Historical Sciences, Professor

Jamoldinova O.R. – Doctor of Pedagogical Sciences, Professor

Sharipov Sh.S. – Doctor of Pedagogical Sciences, Professor

Shermuhhammadov B.Sh. – Doctor of Pedagogical Sciences, Professor

Ma'murov B.B. – Doctor of Pedagogical Sciences, Professor

Madraximova F.R. – Doctor of Pedagogical Sciences, Professor

Kalonov M.B. – Doctor of Economic Sciences, Professor

Nabiyev D.X. – Doctor of Economic Sciences, Professor

Koldoshev K. M. – Doctor of Economic Sciences, Professor

Ikramxanova F.I. – Doctor of Philological Sciences, Professor

Ismagilova F.S. – Doctor of Psychological Sciences, Professor (Russia)

Stoyuxina N.Yu. – Candidate of Psychological Sciences (PhD), Associate Professor (Russia)

Magauova A.S. – Doctor of Pedagogical Sciences, Professor (Kazakhstan)

Rejep O'zyurek – Doctor of Psychological Sciences, Professor (Turkey)

Wookyu Cha – President of the National University of Education, Korea (South Korea)

Polonnikov A.A. – Candidate of Psychological Sciences (PhD), Associate Professor (Belarus)

Mizayeva F. O. – Doctor of Pedagogical Sciences, Professor

Baybayeva M.X. – Doctor of Pedagogical Sciences, Professor

Muxsiyeva A.T. – Doctor of Pedagogical Sciences, Professor

Aliyev B. – Doctor of philosophy, professor

Abdullayeva N. Sh. – Doctor of Pedagogical Sciences (DSc), Professor

Doniyorov S. M. – Editor-in-Chief of the DM Editorial Office of the newspapers “Yangi O'zbekiston” and “Pravda Vostoka”, Honored Journalist of the Republic of Uzbekistan, Doctor of Philosophy (PhD) in Philology, Associate Professor

Gafurov D. O. – Doctor of Philosophy (PhD)

Shomurodov R.T. – Candidate of Economic Sciences (PhD), Associate Professor

Mirzayeva F. O. – Doctor of Pedagogical Sciences (DSc), Associate Professor

Jalilova S.X. – Candidate of Psychological Sciences (PhD), Associate Professor

Bafayev M.M. – Doctor of Philosophy in Psychological Sciences (PhD), Associate Professor

Usmonova D.I. – Associate Professor, Samarkand Institute of Economics and Service

Saifnazarov I. – Doctor of philosophy, professor

Nematov Sh.E. – Candidate of Pedagogical Sciences (PhD)

Tillashayxova X.A. – Candidate of Psychological Sciences (PhD), Associate Professor

Yuldasheva F.I. – Doctor of Philosophy in Pedagogical Sciences (PhD), Associate Professor

Yuldasheva D.B. – Doctor of Philosophy (PhD) in Philological Sciences, Associate Professor

Tangriyev A.T. – is a professor of Tashkent State University of Economics

Ashurov R. R. – Doctor of Philosophy (PhD) in Psychology, Associate Professor

Panjiyev M. A. – First Deputy Head of the Department of Preschool and School Education of the Kashkadarya Region

Khudaiberganov N. A. – Senior Researcher of the Department of Natural Sciences of the Khorezm Mamun

Academy, Doctor of Philosophy (PhD) in Biological Sciences

Vakhobov Anvar Abdusattor oglu – Doctor of Philosophy in Pedagogical Sciences, Associate Professor

“Maktabgacha va maktab ta'limi” jurnali O'zbekiston Respublikasi Oliy attestatsiya komissiyasining quyidagi qarorlariga asosan pedagogika va psixologiya fanlari bo'yicha falsafa doktori (PhD) hamda fan doktori (DSc) ilmiy darajasiga talabgorlarning dissertatsiyalaridagi asosiy ilmiy natijalarni chop etish uchun milliy ilmiy nashrlar ro'yxatiga kiritilgan:

Pedagogika fanlari bo'yicha: OAK Kengashi tavsiyasi (26.08.2024-y., №11-05-4381/01) asosida:

- Ekspert kengashi (29.10.2024-y., №10)
- Rayosat qarori (31.10.2024-y., №363/5)

Psixologiya fanlari bo'yicha: Toshkent davlat pedagogika universiteti murojaatiga asosan OAK tavsiyasi (24.04.2025-y., №11-05-2566/01):

- Ekspert kengashi (25.05.2025-y., №10)
- Rayosat qarori (08.05.2025-y., №370/5)

“Maktabgacha va maktab ta'limi”
jurnali

26.09.2023-yildan

O'zbekiston Respublikasi Prezidenti
Administratsiyasi huzuridagi Axborot
va ommaviy kommunikatsiyalar
agentligi tomonidan **№C-5669363**
reyestr raqami tartibi bo'yicha
ro'yxatdan o'tkazilgan.

Litsenziya raqami: **№136361**

MUNDARIJA

Matematika fanini o'qitishda kommunikativ va ijtimoiy-psixologik yondashuvlar	10
Esonturdiyev Mamatqobil Nurmamatovich	
Geografik axborot tizimlari (GAT) texnologiyalari asosida bo'lajak geografiya o'qituvchilarining innovatsion kompetentligini rivojlantirish metodikasi	13
Bahromova Muhayyo Imomqul qizi	
Geografiya ta'limida sun'iy intellekt texnologiyalaridan foydalanishning nazariy-metodik asoslari	18
Tuyg'unov Murodjon Salimqul o'g'li	
Biologiyani o'qitishda belgili-ramziy ko'rgazmalilik vositalaridan foydalanishning o'quvchilarning tadqiqotchilik faoliyatini rivojlantirishdagi roli	22
Azimov I. T., Daminova F. A.	
PISA 2025 doirasida raqamli ta'lim kompetensiyalarini baholashning innovatsion mexanizmlari	25
Doniyorov Muxiddin Normamatovich, Ishanov Almat Adilxanovich	
Boshlang'ich sinf o'quvchilarining tabiiy savodxonligini oshirishda zamonaviy pedagogik vositalarni qo'llash	28
Abdunazarov Bobir Normurodovich	
Raqamli ta'lim resurslari asosida kredit-modul tizimida talabalarning o'quv faoliyatini takomillashtirish	32
Jumayeva Ra'no To'ychi qizi	
Oila va maktab integratsiyasining shaxs kamolotiga ta'siri	36
Rasulova Dildora Shuhratovna, Raxmatova Zulxumor Alimovna	
Bo'lajak o'qituvchilarda kreativ kompetensiyani shakllantirishning zamonaviy pedagogik mexanizmlari va uning ijtimoiy ahamiyati	40
Sultanova Sahobar Ravshanbekovna	
Boshlang'ich sinf o'quvchilarida ekologik tarbiyani shakllantirishda tabiiy fanning o'rni	43
G'afforova Zarnigor Abdumo'min qizi	
Umumiy o'rta ta'limda o'qituvchi va ota-onalar ijtimoiy hamkorligini rivojlantirish	47
Xalikova Zaxro Mirshadmanovna, Xolbo'tayev Muzaffar Odilovich, Bozorova Xadicha Javlon qizi	
Nutqida kechikish kuzatiladigan bolalarda nutqni qo'l va barmoq motorikasini rivojlantiruvchi o'yinlar orqali shakllantirish	51
Ne'matova Hilola Ikrom qizi, Ahmadova Fotima Adizovna	
Taym menejment asosida bo'lajak o'qituvchilarda liderlik fazilatlarini rivojlantirish	55
Soliyeva Ruxsora Sharobiddin qizi	
Sun'iy intellekt va NLP texnologiyalari asosida elektron ta'lim muhitida talabalarning mustaqil ta'lim kompetensiyalarini rivojlantirish	58
Otakishiyeva Gulshanoy Abdulaziz qizi	
Pedagogik kvalimetriya asosida bo'lajak o'qituvchilarning diagnostik madaniyatini shakllantirishning nazariy asoslari	61
G'aniyeva Muattarxon Nodirbek qizi	
Образовательные технологии с учётом восприятия цвета: психологические и методические аспекты	64
Имамова Хурият Эргаш кизи	
Yosh erkin kurashchilarda chidamlilikni rivojlantirish metodikasini takomillashtirish	69
Ergashov Qaxramonjon Asqarovich	
Boshlang'ich sinf o'quvchilarini mantiqiy masalalar yechishga o'rgatish usullari	76
G'iyosova Dilovar Orif qizi	
Haykaltaroshlik fanining metodik qo'llanilishi	80
Qodirov Bobirjon Botirjonovich	
Ijtimoiy xavf ostidagi bolalarni qo'llab-quvvatlashning jahon tajribasi va psixologik-pedagogik asoslari	85
Manzura Qosmuratova	
Jahonda art-biznes klasterlarining ahamiyati va rivojlanish tuzilmasi	89
A. S. Umarov	
Автоматизация решения сложных математических задач графическим методом для углублённого изучения математики в школе	92
Эргашев Сeroжиддин Султонмуродович, Маматов Ислонбек Ильесович	
Pedagogika darslarida raqamli va onlayn didaktik o'yinlardan foydalanish	97
Qodirova Feruzaxon Abdiyaminovna	
Sun'iy intellekt va tanqidiy fikrlashning kognitiv-konseptual komponenti va uni rivojlantirish metodikasi	102
Sobirova Munavvarxon Qaxramonjon qizi	
Media savodxonlik va axborot madaniyati fanida sun'iy intellekt savodxonligini rivojlantirishning pedagogik-metodik asoslari	106
Ermatov Sherzodbek Latipjonovich, Mirzayev Akramjon O'ktamjonovich	



Adabiy ta'limda kompetensiyaviy yondashuv	111
<i>To'ychiyeva Mahfuza Umarmulovna, Islomova Shalola Ismoil qizi</i>	
Comparative Study of Passive Constructions in English and Their Translation Into Uzbek.....	117
<i>Elmirzayeva Maftuna Dusmurod qizi, Mustafoyeva Nigina Shuhrat qizi</i>	
Bo'lajak o'qituvchilarda kasbiy kompetensiyalarni rivojlantirish orqali pedagogik mas'uliyatni shakllantirishning dolzarb muammolari	122
<i>Botirova Odinoxon Abdumutalib qizi</i>	
Oliy ta'lim muassasalarida mustaqil ta'limni tashkil etishning pedagogik modeli va metodik asoslari	126
<i>Haytbayeva S. R.</i>	
Imkoniyati cheklangan bolalarni psixologik qo'llab-quvvatlash orqali intellektual imkoniyatlarini ro'yobga chiqarish imkoniyatlari.....	131
<i>Kadirova Nigora Saxibjanovna</i>	
Bo'lajak maktabgacha ta'lim mutaxassislarini dual ta'lim asosida kasbiy faoliyatga tayyorlashning nazariy asoslari.....	134
<i>Samiyeva Zuleyxa Uktamovna</i>	
Insonlar orasidagi munosabatlarda noverbal muloqotning komponentlarining ko'rinishlari	139
<i>Soliyev Farxodjon Sodikovich, Karimov Jahongirjon Murodjon o'g'li</i>	
Virtual texnologiyalar vositasida texnika fanlarini o'qitish mazmunini innovatsion rivojlantirish	145
<i>Yuldasheva Dilorom Husniddin qizi</i>	
Maktabgacha ta'lim tashkilotlarida suzish mashg'ulotlarini tashkil etish texnologiyasi.....	150
<i>Toshpulatova Aziza Toyirovna</i>	
Harbiy xizmatchilarda kreativ tafakkurni rivojlantirishning pedagogik va psixologik asoslari	155
<i>Tursunov Shaxzod Ramazonovich, Mansurov Sardorbek Sirojiddin o'g'li</i>	
O'qituvchilar ruhiy salomatligini saqlashning amaliy strategiyalari	159
<i>Begmatov Raximkul Olimovich</i>	
Ona tili darslarida analitik faoliyatni tashkil etish imkoniyatlari	164
<i>Narziyeva Mastura Sunnatovna</i>	
Maktabgacha ta'limda Project-Based learning texnologiyasi asosida tarbiyalanuvchilarning kommunikativ kompetensiyalarini rivojlantirishning pedagogik imkoniyatlari	168
<i>Kubayeva Mavluda, Po'latova Gullola Ravshan qizi</i>	
Talabalarda iqtisodiy savodxonlikni shakllantirishning pedagogik shart-sharoitlari	173
<i>Qo'chqorov Nodir Bozorovich</i>	
Boshlang'ich sinf o'quvchilarini baholash jarayonida foydalaniladigan texnologiyalar va vositalar	178
<i>A'zamqulova Zilola Sunnat qizi</i>	
Raqamli ta'lim muhitida kommunikativ kompetensiyani rivojlantirishning didaktik asoslari.....	183
<i>Isaboyeva Dilyora Zokirjon qizi</i>	
Kimyo fanining tarixiy rivojlanishida metodologik yondashuvlar	187
<i>Begamov Shaxzod To'liqin o'g'li</i>	
Sport bilan shug'ullanishda qo'l va oyoq motorikalarini rivojlantirish mezonlari	190
<i>Imomov Asliddin Abdurazoqovich, Sattarov Qarshiboy Narqulovich</i>	
O'zbek va ingliz tillarida zamon kategoriyasining qiyosiy tahlili	194
<i>Xudoyberdiyeva Dilfuza Alisher qizi</i>	
Hayot faoliyati xavfsizligi fani o'qituvchisining kasbiy kompetentligi va rejalashtirish faoliyati.....	198
<i>Maxmudov Baxtiyor Xayrullayevich</i>	
Dizartriyal bolalarda motorikani rivojlantirish – nutqni rivojlantirishning asosiy omili	202
<i>Mamatova Muzayyana Batirovna</i>	
Expression of Lexical Economy in English and Uzbek Through Stylistic Means	205
<i>Omonov Baxtiyor Uktamovich</i>	
Boshlang'ich sinf o'quvchilarida ijodiy qobiliyatni shakllantirish.....	208
<i>Abrorxonova Kamolaxon Abrorxon qizi, Xamzayeva Sunbula Jasurovna</i>	
Xushmuomalalik strategiyalarining ijtimoiy vazifalari.....	212
<i>Alieva Navruza Xabibullayevna, Azizova Sanobarxon Valijon qizi</i>	
Bo'lajak boshlang'ich sinf o'qituvchilarida shaxslik sifatlarining kasbiy rivojlanishdagi psixologik ahamiyati	216
<i>Dusmetova Maksuda Matnazarovna</i>	
Maktabgacha ta'lim jarayonida bo'lajak tarbiyachilarning illustrativ yondashuv asosida kreativ va variativ faoliyat olib borish usullari va yo'llari.....	221
<i>Egamberdiyeva Madina Sharif qizi</i>	
Pragmatic Functions in Neurolinguistic Communication	224
<i>Fayziyeva Parvina</i>	
Sahro gavhari: ruslar istilosigacha bo'lgan davrda Xiva me'morchiligi tarixi	227
<i>Islomjon Xojjigitovich Mirzakulov</i>	
Moslashuvning psixologik mexanizmlari: ta'lim muhiti sharoitida shaxsning adaptatsiyasi.....	235
<i>Jaynarova Sayyora Isoqul qizi, Nuraliyeva Nasiba</i>	
Onalik psixologiyasi va o'rganishning nazariy jihatlari.....	238
<i>Kasimova Xulkar Atabayevna</i>	

Spheres of Language Use.....	243
Kumakbayeva Gulbanu Kuntuarovna	
Bo'lajak boshlang'ich ta'lim o'qituvchilarida kreativ tafakkurni rivojlantirishda nostandart topshiriqlar metodikasi.....	246
Muxammadiyeva Dinora Tursunpulatovna	
Bo'lajak boshlang'ich sinf o'qituvchilarida kasbiy-axloqiy qadriyatlarni shakllantirishning pedagogik mexanizmlari va didaktik tamoyillari.....	251
N. Jurayev	
Dunyo bolalari huquqlarini himoya qilish: global muammolar, tizimli kamchiliklar va tanqidiy tahlil	255
Nargiza Ergasheva	
Talabalarning dasturlashga oid agoritmik fikrlashini rivojlantirish orqali innovatsion faoliyatga tayyorlash usuli	259
Orziqulova Barchinoy Ixtiyor qizi	
Talabalarda o'z-o'zini boshqarish qobiliyatining tuzilmasi va psixologik komponentlari (motivatsion, kognitiv, irodaviy, emotsional-regulyativ komponentlar)	264
Otabekova Nargiza Avazbek qizi	
O'zbek va ingliz tillaridagi metaforalarda til va madaniyat uyg'unligi.....	269
Rasulova Munajat Akmaljonovna	
Limitlar nazariyasini kompyuter imitatsion modellar vositasida o'qitish metodikasi.....	273
Safarov Abbos Abdurasul o'g'li	
Ijtimoiy hamkorlik – barkamol avlodni tarbiyalash poydevori.....	278
Sharipova Gulruxsor Nurkabilovna	
Bo'lajak o'qituvchilarda kreativ kompetensiyani shakllantirishning zamonaviy pedagogik mexanizmlari va uning ijtimoiy ahamiyati.....	282
Sultanova Sahobar Ravshanbekovna	
Badiiy gimnastika mashg'ulotlarida innovatsion pedagogik texnologiyalardan foydalanish	285
Tuxtayeva Azizabonu Abdurasulovna	
Matematika fanini o'zlashtirishda boshlang'ich sinf o'quvchilarining semiotik yondashuvini shakllantirish ...	289
Xayrullayev Ismatulla Nurullayevich	
Pedagogik qadriyatlar asosida o'quvchilarni tarbiyalash mexanizmlarini takomillashtirish	293
Xoliqova Inobatxon Bo'ri qizi	
Umumta'lim maktabida elektron axborot-ta'lim resurslari.....	296
Xolmurodov Shuxrat Okboyevich, Norqobilov Hakimbek Nuriddin o'g'li	
Maktabgacha ta'lim tashkilotlarida bolaning kreativligini shakllantirishda innovatsion muhit	300
Xonnazarova Gulasal Yusuf qizi	
Ta'lim tizimida sinf rahbari faoliyatining joriy etilishining tarixiy asoslari va zamonaviy ko'rinishlari	303
Xusenova Sadoqat Botirovna	
Искусственный интеллект в методике преподавания русского языка: адаптивная обратная связь и развитие коммуникативной компетенции	308
Джалилова Феруза Намазовна	
Образовательные технологии с учётом восприятия цвета: психологические и методические аспекты.....	312
Имамова Хурият Эргаш кизи	
Межкультурный диалог как инструмент воспитания гармоничной личности в школе	317
Махмудхожаев Ориф Бахтиёрович	
Психологические факторы успешности профессионального обучения студентов	319
Рахимходжаева В. С.	
Специфика восприятия окружающего мира в лирике Афанасия Фета	325
Татьяна Викторовна Половинкина	
Анализ разработки женских коллекций с использованием стилистических и конструктивных особенностей ретро-моды	329
Абдурахманова Н., Рахматуллаева У. С.	
Использование современных образовательных технологий в начальной школе как средство развития познавательной активности учащихся	333
Фазилова Гулчехра Ахмедовна	
Nyuman (Newman) xatolar tahlili modelining geometrik isbotlash ko'nikmalarini shakllantirishdagi ahamiyati.....	337
Davletov Davronbek Egamberganovich	
“Informatika” fani mavzularini taksonomik yondashuv asosida o'qitish	343
Axrarov Baxtiyor Sagdullayevich	
O'qituvchi faoliyatida pedagogik texnologiyalarni samarali qo'llash metodikasi.....	347
Xomidjonov Abrorjon Olimjon o'g'li	
Rus-o'zbek tarjimashunosligining zamonaviy tendensiyalari.....	351
Kudratov Kamoljon Islomovich	
Kompyuterga qaramlikning o'smirlarga ta'siri va uning psixologik oqibatlari.....	356
Kushakova Nargiza Islambayevna, Ergasheva Sarvinoz Shavqiddin qizi	



Musiqa ning neyropsixologik rivojlanish va ta'lim jarayonidagi ahamiyati	360
<i>Xikmatova Shohida Xikmatovna</i>	
Innovatsion yondashuv asosida inklyuziv ta'lim o'quvchilarining yozma nutqini rivojlantirish	364
<i>Alimardanova Sitora Ikrom qizi</i>	
Comparative and Conceptological Trends in Linguoculturology	367
<i>Ablakulov Ilkhom</i>	
Boshlang'ich ta'limda kreativ ta'lim muhitini rivojlantirish asosida o'quvchilarning muammolarni hal qilish ko'nikmalarini shakllantirish	370
<i>Abdullayeva Uljalg'as</i>	
Rivojlangan mamlakatlar ta'lim tizimida talabalarni kasbiy faoliyatga tayyorlashda sun'iy intellektdan foydalanish usullari.....	373
<i>Aglamova Shahzoda Sobirovna</i>	
Bokschi qizlar texnik harakatlarining kinematik ko'rsatkichlar asosida takomillashtirish metodikasi	378
<i>Axmedov Latifjon G'ayrat o'g'li</i>	
O'quv jarayonida formativ baholashning evolyutsion-xronologik tahlili	383
<i>Davidova Dilnoza Tadjibayevna</i>	
Oliy ta'limda "Smart Education" texnologiyalaridan foydalanishning samaradorligi	388
<i>Dilrabo Amriddinova, Abdulxalilova Surayyo Ahad qizi</i>	
Zamonaviy ta'lim sharoitida boshlang'ich sinf o'qituvchilarini baholash kompetensiyalarini rivojlantirishning psixologik-pedagogik xususiyatlari	392
<i>Majidova Hilola Eshquvat qizi</i>	
Sun'iy intellekt texnologiyalaridan foydalanish madaniyatini shakllantirish usullari	396
<i>Mamatova Fazilat Ixtiyorovna, Xolmirzayeva Zebo Ravshan qizi</i>	
Jismoniy tarbiya o'qituvchilarini sport marketologi faoliyatiga tayyorlashning zarurati	402
<i>Samatov Javlonbek Abdukayumovich</i>	
O'zbekiston maktabgacha ta'lim tizimida strategik boshqaruvni takomillashtirish.....	406
<i>Saydullayeva Nargis</i>	
Integrating Literary Texts Into Early Foreign Language Education: A Mixed-Methods Investigation of Lexical, Cognitive, and Affective Outcomes in Primary Classrooms	410
<i>Shukurova Zamira Shodiyevna</i>	
Fizika fanini o'qitishda formativ baholash asosida tanqidiy fikrlashni rivojlantirishning metodik modeli.....	416
<i>Sobirov Avazbek Anvarovich</i>	
Maktabgacha yoshdagi bolalarning kichik motorikasini rivojlantirishda o'yinning ahamiyati va individual yondashuv	421
<i>Norboyeva Laylo Sapar qizi</i>	
Психологические особенности проявления творческих способностей у подростков, воспитывающихся в бикарьерных семьях.....	425
<i>Ишбобоева Гулбарчин Рустамовна</i>	
Maktabgacha yoshdagi bolalarga chet tilini vizual materiallar vositasida o'rgatishni takomillashtirish.....	433
<i>Olimova Shahlo Bahodir qizi, Inomova Mahliyo Yusuf qizi</i>	
Boshlang'ich sinf o'quvchilarida nutqiy kompetensiyani rivojlantirish metodikasining hozirgi holati va muammolari.....	439
<i>Diyoraxon To'htanazarova Zokir qizi</i>	
Turkiy xalqlarning an'anaviy sport o'yinlariga yil fasllaridagi o'zgarishlarning ta'siri.....	443
<i>Qodirova Xalimaxon Nurmuhammad qizi</i>	
Нововведения в шкале стоимости элементов и коэффициентах компонентов программы ISU на 2026 год	447
<i>Федорова Светлана Вячеславовна</i>	
Ingliz tilidagi conjunctionlarning grammatik tasnifi va sintaktik vazifalari hamda ESP darslarida ularni o'rgatishning kommunikativ va kontekstual usullari	451
<i>Mahammadiyeva Mashxura Maxmur qizi</i>	
Bo'lajak boshlang'ich sinf o'qituvchilarida lisoniy tahlil ko'nikmalarini shakllantirishning zamonaviy metodikasi	456
<i>Yo'ldashova Dilso'z Umar qizi</i>	
Voleybolchilarning sakrovchanlik ko'nikmalarini shakllantirishda harakatli o'yinlarning ahamiyati.....	461
<i>Artikov Xayrulla Baxtiyarovich</i>	
Effectiveness of Personalized Studying via Artificial Intelligence in Teaching English as a Second Language to Non-Native Speakers	465
<i>Irzakulova Raykhon</i>	
Texnologik ta'limda mustaqil ta'limni rivojlantirish yo'llari	469
<i>Yaxshiboyev Temur-Malik Erkin o'g'li, Jonuzoqova Charos Ziyodulla qizi</i>	
Maktabgacha yoshdagi bolalarda zamonaviy o'yin vositalarining aqliy va ruhiy rivojlanishga ta'siri.....	474
<i>Abduxamidova Dilorom Abdumuminovna</i>	
Nodavlat maktabgacha ta'lim tashkilotlarida pedagog kadrlar salohiyatini boshqarishning zamonaviy yondashuvlari tahlili	479
<i>Mamatqulova Shohsanam Dilshodovna</i>	



Bo'lajak ingliz tili o'qituvchilarini mustaqil ta'limni tashkil qilishga o'rgatishning pedagogik asoslari	485
<i>Xamdamon Usmon Ergashevich</i>	
Boshlang'ich ta'limda ona tili darslarini innovatsion texnologiyalar asosida tashkil qilish masalasi	490
<i>Adizova Nodira Baxtiyorovna, Ibotova Shahnoza Shuxrat qizi</i>	
Malaka oshirish tizimida sifat menejmenti: "sun'iy intellekt" va "boshqaruv mexanizmi" tushunchalarining ierarxik bog'liqligi.....	494
<i>Allanazarova Maftuna Qobul qizi</i>	
"Uglevodorodlar" bo'limini o'qitishni axborot kommunikatsion texnologiyalar vositasida takomillashtirish metodikasi (umumiy o'rta ta'lim maktablari 10-sinflar o'quvchilari misolida)	498
<i>Babajanova Nilufar Pirnafas qizi</i>	
Axborot texnologiyalari vositasida bo'lajak o'qituvchilarning kasbiy-kommunikativ ko'nikmalarini shakllantirish darajasini baholash mezonlari va ko'rsatkichlari.....	506
<i>Junaydullayev Oxunjon Kaxorjon o'g'li</i>	
Bo'lajak o'qituvchilarni aralash ta'lim texnologiyalaridan foydalanishga tayyorlashning pedagogik xususiyatlari va tarkibiy komponentlari	510
<i>Kabirova Zarifa Muqaddamovna</i>	
Maktabgacha ta'limda qoraqalpoq ertaklari orqali bolalar tilini rivojlantirishning kognitiv asoslari	516
<i>Matjanova Gulzada Annabayevna</i>	
Issiq sharoitiga marafonchilar va futbolchilarning fiziologik moslashuvi xususiyatlari	520
<i>Nurbayev Baxtiyor Shirinovich</i>	
Xorijlik talabalarining tinglab tushunishdagi qiyinchiliklarini metakognitiv strategiyalar orqali bartaraf etish ..	524
<i>Odiljonova Nilufarxon Avduvahob qizi</i>	
O'qituvchilarda kasbiy so'nish va psixologik stress holatlarini keltirib chiqaruvchi psixologik-pedagogik omillar	528
<i>Usmonov Salaxdin Alikulovich, Ortiqova Malika Odiljon qizi, Xolbekova Dinora Faxriddin qizi</i>	
Umumta'lim maktablarida texnologik kompetensiyalarni rivojlantirishning amaldagi holati va metodik muammolari	533
<i>Qurbonmurotov Eldor Abdusaidovich</i>	
Talabalarni kasbiy faoliyatga tayyorlashda raqamli texnologiyalar va ularning imkoniyatlari	538
<i>Xujaniyozova G. S.</i>	
Maktabgacha yoshdagi bolalarda ijtimoiy ongllilik darajasini baholash mezonlari va ko'rsatkichlari (oilaviy muhit misolida)	543
<i>Yakubov Odiljon Tolibjon o'g'li</i>	
Raqamli texnologiyalar davrida o'zbek tilining qo'llanilish istiqbollari	549
<i>Yuldasheva Dilnoza Bekmurodovna</i>	
Обучение образованию и употреблению форм числа имён существительных в школьном курсе русского языка	553
<i>Идиева Гульмира Изомовна</i>	
Yosh sportchilarda biokimyoviy ko'rsatkichlarning funksional tayyorgarlikka ta'siri.....	556
<i>Alimova Nasiba Adxamovna</i>	
Lingvistik kompetensiya: nazariy asoslari va mazmuni	566
<i>Eshbekova Dilnoza Ibraimovna</i>	
Jismoniy tarbiya tizimida sport o'yinlarining o'rni ahamiyati	569
<i>Muxamedjanov Umidulla Fayzullayevich</i>	
Delinkvent xulq-atvorning psixologik va ijtimoiy omillari, prevensiyasi va intervensiya usullari.....	572
<i>Xolmurotova Shoxista Mirzaliyevna</i>	
Matematika fanini o'qitishda raqamli texnologiyalar va dasturiy ta'minotlarning o'rni	577
<i>Sobirova Dinora Umidjon qizi</i>	
Maktabgacha ta'lim tashkilotlari maktabga tayyorlov guruhi tarbiyalanuvchilarini maktab ta'limiga ijtimoiy moslashuvchanligini rivojlantirish	583
<i>Akramova Dildora Ergashboy qizi</i>	
O'smirlarning kitobxonlik madaniyatini yuksaltirishda oila-maktab hamkorligining ijtimoiy-pedagogik mexanizmlari.....	587
<i>Xudoyberdiyeva Marhabo Abduqahhorovna</i>	
Bridging Jadid Reformism and 21 st -Century Pedagogy: The Structural Framework of Abdulla Avloni's Educational Legacy	591
<i>Lola Rakhmonovna Djurakulova, Karina Eduardovna Bushevskaya</i>	
Yengil atletikada ko'p yillik sport mashg'ulotlarini boshqarishning tashkiliy-metodik asoslari.....	595
<i>Hakimova Mushtariybonu Hamidovna, Tursunpolatova Ziyoda Jahongir qizi</i>	
Pedagogik oliy ta'lim muassasalari talabalari intellektual salohiyatini rivojlantirishda pedagogik artistizmning didaktik imkoniyatlarini takomillashtirish	599
<i>Karriboeva Lobarxon Fayzulla qizi</i>	
Chidamlilik tushunchasi, chidamlilikning turlari, ko'rsatkichlari va uni rivojlantirish metodlari	603
<i>Shaalimov Muxtorsha Atxamovich</i>	
X, Y va Z avlodiga mansub ayollarda qadriyatlar shakllanishining ijtimoiy-psixologik omillari	607
<i>Feruza Abduraxmonova</i>	



Musiqa terminlarini izohli lug'atlarda berishning zamonaviy ilmiy-amaliy asoslari.....	612
Abdialimova Maxfuza Safarboy qizi	
Ta'lim muhiti, pedagoglar malakasi va o'quv dasturlarini baholash.....	617
Mutalova Dilnoza Abdurashidovna	
The Role of Interactive Technologies in Developing the Cognitive Activities of Future Foreign Language Teachers	621
Shukurov Uktam Bakhodirovich	
Rezervga bo'shatilgan harbiy xizmatchilar ijtimoiy-psixologik reintegratsiyasining empirik xususiyatlari.....	625
Ikmattulayev G'ayrat Zokirovich	
Oliy ta'lim muassasalarining bo'lajak o'qituvchilarini ijtimoiy pedagogik faoliyatga kasbiy metodik tayyorlashning pedagogik shart-sharoitlari	632
Ali Tursaotov	
Kognitiv yondashuv asosida bo'lajak ijtimoiy ish xodimlarida sanogen refleksiyaning rivojlantirish modeli	636
Ismailov Murodulla Kaxramonovich	
Rang konseptlarini o'qitishga oid xalqaro tadqiqotlar tahlili: ilmiy bo'shliqlar va metodologik istiqbollari	643
Arabova Gulnura Yuzboy qizi	
Sun'iy intellektning inson tafakkur jarayonlariga psixologik ta'siri.....	648
Usmonov Sherzod Axmadjonovich, Raxmonov Sa'natjon Baxtiyorovich	
Milliy cholg'u ansambllari orqali o'quvchilar musiqiy dunyoqarashini shakllantirish	651
Dadamirzayeva Gulshanoy To'lanjon qizi	
Raqamli kompetensiyalar tizimi va talaba mustaqilligining pedagogik-psixologik ko'rsatkichlari	656
Qahramonova Xumora Qahramonovna	
Oliy ta'limda axborot texnologiyalaridan foydalanish madaniyatini shakllantirish mexanizmlari	661
Ochilova Gulnoza Odilovna	
O'zlashtirish psixologiyasining rivojlanish bosqichlari: psixometrik yondashuvdan raqamli ta'lim muhitigacha	665
Mo'minxo'jayeva Zuhra Alimjon qizi	
GeoGebra yordamida ko'pyoqlilarni o'qitish metodikasi.....	672
Pirlepsov Umrbek Baxtiyor o'g'li	
Boshlang'ich tayyorgarlik bosqichidagi dzyudochilarning umumiy jismoniy tayyorgarligini rivojlantirish usullari	675
Jumanova Iroda Shokirjon qizi	
O'zbekistonda nogironligi bo'lgan shaxslarni ijtimoiy integratsiya va tibbiy korreksiyalash istiqbollari	678
Jurayeva Mushtariy Muxaydinovna	
Oila hamkorligida koxlear implantli bolalarni inklyuziv ta'limga tayyorlash	684
Atamirzayeva Zebunniso Baxtiyor qizi	
Bulutli texnologiyalar va ularning ta'lim jarayonidagi o'rni	689
Shirinov Feruzjon Shuxratovich, Yuldasheva Gulsanam Odiljon qizi	
O'zbek tilida axborot-kommunikatsiya texnologiyalariga oid neologizmlarning shakllanishi va qo'llanish xususiyatlari	692
Bektosheva Mehinbonu Abdumalik qizi	
Ota-onalar va mahalla faollarining pedagogik kompetensiyasini rivojlantirishning zamonaviy mexanizmlari..	695
Abdurazoqova Marg'uba Muxammad qizi	
Forming Emotional Intelligence of Primary School Students Through Extracurricular Activities	700
Yusupova Diloromxon	
Tibbiyot oliy ta'lim muassasalarida talaba qizlarining gipodinamiyaga qarshi jismoniy tayyorgarligini oshirishda aerobik fitnes uslubi.....	704
Ziyatov Muhammad Namazovich	
Using Innovative Educational Technologies in Organizing Laboratory Classes in Zoology	708
Saidova Dilnavoz Bakturdiyevna	
Konnotativ mohiyatli o'quv materiallarini samarali o'zlashtirish usullari.....	713
Xoshimova Dilnoza Rixsiboyevna	

USING INNOVATIVE EDUCATIONAL TECHNOLOGIES IN ORGANIZING LABORATORY CLASSES IN ZOOLOGY

Saidova Dilnavoz Bakturdiyevna

Senior Lecturer, Department of Biology
Chirchik State Pedagogical University

Abstract: This article analyzes the pedagogical opportunities of using innovative educational technologies in organizing laboratory classes in Zoology. The role of modern pedagogical technologies in improving the practical training of pre-service biology teachers, developing their research skills, and fostering professional competencies is highlighted. The study demonstrates that the integration of problem-based learning, project-based learning, the STEAM approach, digital technologies, and virtual laboratories contributes significantly to enhancing the effectiveness of students' practical activities. The findings indicate that innovative educational technologies promote active learning, independent inquiry, critical thinking, and the acquisition of practical skills necessary for future professional practice in biology education.

Key words: zoology, laboratory classes, innovative technologies, competency-based approach, virtual laboratory, STEAM, biology education, research activity.

Annotatsiya: Mazkur maqolada zoologiya fanidan laboratoriya mashg'ulotlarini tashkil etishda innovatsion ta'lim texnologiyalaridan foydalanishning pedagogik imkoniyatlari tahlil qilingan. Bo'lajak biologiya o'qituvchilarining amaliy tayyorgarligini takomillashtirish, tadqiqotchilik ko'nikmalarini rivojlantirish hamda kasbiy kompetensiyalarini shakllantirishda zamonaviy pedagogik texnologiyalarning o'rni yoritilgan. Tadqiqot natijalari muammoli ta'lim, loyihaviy ta'lim, STEAM yondashuvi, raqamli texnologiyalar va virtual laboratoriyalarni integratsiyalash talabalarning amaliy faoliyati samaradorligini sezilarli darajada oshirishini ko'rsatdi. Olingan natijalar innovatsion ta'lim texnologiyalari faol o'qitish, mustaqil izlanish, tanqidiy fikrlash hamda biologiya ta'limidagi kelajakdagi kasbiy faoliyat uchun zarur bo'lgan amaliy ko'nikmalarni shakllantirishga xizmat qilishini tasdiqlaydi.

Kalit so'zlar: zoologiya, laboratoriya mashg'ulotlari, innovatsion texnologiyalar, kompetensiyaviy yondashuv, virtual laboratoriya, STEAM, biologiya ta'limi, tadqiqotchilik faoliyati.

Аннотация: В данной статье проанализированы педагогические возможности использования инновационных образовательных технологий при организации лабораторных занятий по зоологии. Освещена роль современных педагогических технологий в совершенствовании практической подготовки будущих учителей биологии, развитии их исследовательских навыков и формировании профессиональных компетенций. Результаты исследования показывают, что интеграция проблемного обучения, проектного обучения, подхода STEAM, цифровых технологий и виртуальных лабораторий значительно повышает эффективность практической деятельности студентов. Полученные данные свидетельствуют о том, что инновационные образовательные технологии способствуют активному обучению, самостоятельному исследованию, развитию критического мышления и формированию практических навыков, необходимых для будущей профессиональной деятельности в области биологического образования.

Ключевые слова: зоология, лабораторные занятия, инновационные технологии, компетентностный подход, виртуальная лаборатория, STEAM, биологическое образование, исследовательская деятельность.

INTRODUCTION

In our country, large-scale reforms are being implemented to modernize the higher education system, develop the professional competencies of future teachers, and improve the quality of education in accordance with international standards. These reforms require the enhancement of pedagogical education content, the integration of innovative educational technologies into the teaching process, and the strengthening of students' practical training. In preparing students majoring in biology education to meet the demands of contemporary schools, Zoology occupies a particularly important place.

Zoology is one of the fundamental disciplines within the system of biological sciences, focusing on the study of animal diversity, taxonomy, anatomy, morphology, physiology, ecology, and evolutionary development.



The knowledge acquired through the study of Zoology provides a solid foundation that enables future biology teachers to explain biological processes scientifically and effectively to school students.

However, the teaching of Zoology should not be limited solely to the transmission of theoretical knowledge. It is equally important to develop students' practical skills, including observing, comparing, and analyzing biological objects, using laboratory equipment, preparing biological specimens, and drawing scientific conclusions. Laboratory classes serve as the primary means of connecting theoretical knowledge with practical activities, enhancing students' research potential, and developing their professional competencies.

In recent years, the introduction of digital technologies, virtual laboratories, electronic learning platforms, artificial intelligence tools, and STEAM technologies into the educational process has significantly expanded the possibilities for organizing laboratory classes. These technologies help transform students into active participants in the learning process, promote independent inquiry, and foster the development of research skills.

Moreover, innovative educational technologies create opportunities for visualizing complex biological processes, simulating laboratory experiments, and providing students with access to diverse learning resources. Such opportunities are particularly important in Zoology, where direct observation, experimentation, and practical investigation are essential components of effective learning. Therefore, the use of innovative educational technologies in organizing Zoology laboratory classes has become one of the most relevant issues in modern biology education and teacher training.

However, practical experience shows that in some cases, Zoology laboratory classes are still organized in a traditional manner, where students are mainly limited to acquiring ready-made information. This situation hinders the full development of their competencies in independent thinking, problem-solving, conducting scientific observations, and analyzing biological processes.

This circumstance highlights the need to develop and implement scientific and methodological foundations for organizing Zoology laboratory classes based on innovative pedagogical technologies.

LITERATURE REVIEW

The theoretical and methodological foundations of innovative educational technologies have been studied by many scholars. In particular, John Raven emphasized the importance of competency-based education in developing learners' ability to apply knowledge in real-life situations. Franz E. Weinert highlighted competencies as an integration of knowledge, skills, attitudes, and values necessary for effective professional performance.

In the field of biology education, scholars such as N. A. Muslimov, B. X. Xodjayev, and O. Q. Tolipov have investigated the pedagogical conditions for developing professional competencies through innovative teaching technologies. Their studies indicate that project-based learning, problem-based learning, and digital technologies significantly improve students' practical and research skills.

Recent studies also emphasize the effectiveness of the STEAM approach and virtual laboratories in organizing biology and Zoology education. However, the methodological aspects of integrating innovative educational technologies into Zoology laboratory classes require further research and practical implementation.

RESEARCH METHODOLOGY

This study was conducted on the basis of competency-based, systemic, activity-oriented, and innovative approaches. The methodological foundation of the research was formed by the theory of biology education, the concept of competency-based education, constructivist learning theory, and modern pedagogical technologies.

During the research process, the current state of organizing Zoology laboratory classes was analyzed, and pedagogical factors contributing to the development of students' practical preparedness were identified.

The following research methods were employed:

- analysis of pedagogical, biological, and methodological literature;
- examination of normative-legal documents and educational curricula;
- observation;
- interviews;
- questionnaire surveys;
- expert evaluation;
- pedagogical experimentation;
- mathematical and statistical analysis.

In addition, innovative technologies used in organizing Zoology laboratory classes were classified, and their pedagogical effectiveness was evaluated.

Within the framework of the study, the following criteria were developed to assess students' laboratory competencies:

1. **Motivational Criterion** - students' interest in laboratory activities, inclination toward biological research, and level of professional motivation;
2. **Cognitive Criterion** - the level of mastery of zoological knowledge and understanding of scientific concepts;
3. **Activity-Based Criterion** - the quality of working with laboratory equipment, preparing biological specimens, and performing practical tasks;
4. **Reflective Criterion** - the ability to analyze completed work, identify mistakes, and draw independent conclusions.

These criteria made it possible to comprehensively evaluate students' readiness for practical activities and determine the effectiveness of innovative educational technologies in the development of professional competencies among future biology teachers.

During the experimental phase of the study, a variety of innovative educational approaches were integrated into laboratory classes, including project-based learning, problem-based learning, the STEAM approach, case-study methods, digital microscopes, virtual laboratories, and interactive presentations.

ANALYSIS AND RESULTS

Laboratory classes in Zoology constitute an integral component of biology education and play a significant role in preparing students for scientific observation and experimental activities. The primary purpose of laboratory work is to enable students to apply theoretical knowledge in practice, investigate biological objects, and develop research competencies essential for their future professional careers.

The results of the study demonstrated that the use of innovative technologies significantly increases the effectiveness of laboratory classes.

The implementation of the project-based learning method promotes students' independent learning activities. Students engage in scientific inquiry by studying specific zoological objects, investigating their ecological characteristics, and presenting the obtained results. Such activities foster independent decision-making skills and contribute to the development of scientific thinking.

Laboratory classes organized on the basis of problem-based learning encourage students to discover new knowledge independently rather than merely receiving ready-made information. For example, tasks aimed at identifying the adaptation mechanisms of particular organisms to their habitats stimulate analytical thinking and problem-solving abilities.

The STEAM approach provides opportunities for integrating Zoology with other disciplines. Analyzing biometric characteristics of zoological specimens using statistical methods, processing ecological data through digital platforms, and presenting results in graphical formats contribute to the development of students' scientific research competencies and interdisciplinary thinking.

Virtual laboratories enable students to observe and analyze biological objects remotely. One of their major advantages is the possibility of repeatedly simulating complex biological processes, ensuring compliance with safety requirements, and making more efficient use of laboratory resources. These tools create flexible learning environments that support both individual and collaborative learning activities.

Furthermore, virtual laboratory technologies allow students to conduct experiments that may be difficult, expensive, or impossible to perform under traditional laboratory conditions, thereby expanding educational opportunities and enhancing the quality of practical training in Zoology.

Digital microscopes, mobile applications, QR codes, electronic atlases, and artificial intelligence-based identification software enhance the quality of studying zoological objects. These tools enable students to determine the taxonomic position of animals, analyze their morphological characteristics, and store research results in electronic databases.

The conducted analysis demonstrated that laboratory classes organized on the basis of innovative technologies significantly increase students' engagement, interest, and practical preparedness. Such activities not only strengthen zoological knowledge but also contribute to the development of the professional competencies of future biology teachers.



The effectiveness of organizing Zoology laboratory classes through innovative educational technologies was investigated during the study. The results revealed that, compared with traditional laboratory instruction, the implementation of innovative technologies led to significant improvements in students' learning engagement, independent learning skills, and research competencies.

The application of project-based learning and problem-based learning strategies in laboratory classes enhanced students' ability to analyze biological phenomena and draw scientific conclusions. The quality of practical assignments completed by students and their level of independence increased considerably.

The use of virtual laboratories and digital microscopes contributed to the development of students' skills in identifying zoological specimens, analyzing morphological structures, and explaining biological processes. In particular, the use of digital tools in the study of complex biological objects improved the level of learning and comprehension of educational materials.

During the experimental implementation, the following positive outcomes were observed:

- increased student participation and engagement in laboratory activities;
- improved skills in observing and describing biological objects;
- enhanced proficiency in using microscopes and other laboratory equipment;
- strengthened interest in research and project-based activities;
- development of independent learning skills;
- improved ability to analyze biological processes and draw scientific conclusions;
- increased levels of professional competency development.

These findings indicate that innovative educational technologies create favorable conditions for improving the quality of laboratory instruction, promoting active learning, and preparing future biology teachers for effective professional practice in modern educational environments.

The results of the study indicate that laboratory classes organized through innovative technologies contribute significantly to the development of students' ability to apply knowledge in practical situations and enhance their level of professional preparedness.

Furthermore, the use of innovative technologies enriches the content of laboratory classes and creates opportunities for making the learning process more engaging, interactive, and effective. As a result, students acquire a deeper understanding of zoological concepts and learn to approach biological objects from a scientific perspective.

The findings are consistent with previous research on the use of innovative pedagogical technologies in biology education. According to contemporary educational theories, student-centered and activity-based teaching methods improve learning outcomes and positively influence the formation of professional competencies.

The study demonstrated that project-based learning and problem-based learning possess high pedagogical effectiveness in organizing laboratory classes in Zoology. These approaches not only facilitate knowledge acquisition but also develop students' ability to apply their knowledge in practical and professional contexts.

The discussion further revealed that virtual laboratories and digital technologies can help address several challenges commonly encountered in biology education. For example, the lack of certain zoological specimens, limited laboratory resources, or difficulties associated with observing biological processes under real conditions can be effectively overcome through virtual learning environments.

In addition, laboratory classes organized using the STEAM approach promote interdisciplinary integration and broaden students' scientific perspectives. Consequently, students develop a systematic understanding of biological phenomena and strengthen their professional competencies.

Another important finding of the study concerns the role of reflective activities. Reflection sessions conducted at the end of laboratory classes enabled students to evaluate their own performance, identify mistakes, and determine ways to improve future learning activities.

Overall, innovative technologies enrich the content of Zoology laboratory classes, increase the interactivity of the educational process, and contribute to improving the professional preparation of future biology teachers.

CONCLUSION

The conducted research demonstrated that the use of innovative educational technologies in organizing Zoology laboratory classes is pedagogically effective and contributes to improving the quality of biology teacher education.

Based on the findings of the study, the following conclusions were drawn:

1. Organizing Zoology laboratory classes through innovative technologies contributes to the development of students' knowledge, practical skills, and professional competencies.
2. Project-based learning, problem-based learning, and the STEAM approach serve as important pedagogical tools for increasing the effectiveness of laboratory instruction.
3. Virtual laboratories and digital technologies expand opportunities for studying biological objects and enhance the interactivity of laboratory activities.
4. Innovative educational technologies promote students' research skills, independent learning abilities, and professional development.
5. Reflective activities play a significant role in improving laboratory learning outcomes and fostering continuous professional growth.
6. The systematic integration of innovative technologies into Zoology laboratory classes contributes to improving the professional readiness of future biology teachers and strengthening the practical orientation of biology education.
7. Future studies should focus on exploring the educational potential of artificial intelligence technologies, virtual reality (VR), augmented reality (AR), and advanced digital learning platforms in Zoology education and laboratory training.
8. Innovative educational technologies contribute to the development of students' research abilities, foster independent learning skills, and support the improvement of their professional competencies.
9. The implementation of reflective activities in Zoology laboratory classes positively influences students' self-assessment skills and professional growth.
10. The systematic use of innovative pedagogical technologies is essential for enhancing the professional preparation of future biology teachers.
11. Future research should focus on exploring the pedagogical potential of artificial intelligence (AI) technologies, virtual reality (VR), augmented reality (AR), and digital biological platforms in the organization of Zoology laboratory classes, as these represent promising directions for educational innovation.

The findings of this study can contribute to the improvement of laboratory instruction in biology education, the development of professional competencies among future biology teachers, and the overall enhancement of educational quality.

References:

1. Decree of the President of the Republic of Uzbekistan No. PF-60 of January 28, 2022. On the Development Strategy of New Uzbekistan for 2022-2026.
2. Decree of the President of the Republic of Uzbekistan No. PF-6108 of November 6, 2020. On Measures for the Further Development of Education, Upbringing, and Science.
3. Resolutions of the Cabinet of Ministers of the Republic of Uzbekistan On Approval of the State Educational Standards for Higher Education.
4. Tolipov, O.Q., & Usmonboyeva, M. (2020). *Pedagogik texnologiyalarning tatbiqiy asoslari [Applied Foundations of Pedagogical Technologies]*. Tashkent: Fan va texnologiya. 276 p.
5. Muslimov, N.A., Usmonboyeva, M.H., & Sayfurov, D.M. (2019). *Pedagogik kompetentlik va kreativlik asoslari [Foundations of Pedagogical Competence and Creativity]*. Tashkent: Sano-standart. 240 p.
6. Azizxo'jayeva, N.N. (2018). *Pedagogik texnologiyalar va pedagogik mahorat [Pedagogical Technologies and Teaching Mastery]*. Tashkent: TDPU. 210 p.
7. Xodjayev, B.X. (2021). *Umumiy pedagogika nazariyasi va amaliyoti [Theory and Practice of General Pedagogy]*. Tashkent: Sano-standart. 416 p.
8. Sharipov, Sh.S. (2021). *Kasbiy kompetentlikni rivojlantirishning nazariy asoslari [Theoretical Foundations of Professional Competence Development]*. Tashkent: Fan va texnologiya. 198 p.
9. Inoyatov, U.I., & Muslimov, N.A. (2020). *Kasbiy ta'lim pedagogikasi [Pedagogy of Vocational Education]*. Tashkent: Iqtisod-moliya. 312 p.
10. Hamidov, J.A. (2022). *Biologiya fanlarini o'qitish metodikasi [Methodology of Teaching Biology]*. Tashkent: Tafakkur. 286 p.
11. Boymurodova, G.T. (2022). *Biologik ta'limda kompetensiyaviy yondashuvning metodik asoslari [Methodological Foundations of the Competency-Based Approach in Biology Education]*. *Pedagogik ta'lim*, 4, 45-52.

- 
- 13.00.00 Pedagogika fanlari
 - 13.00.01 Pedagogika nazariyasi. Pedagogik ta'limotlar tarixi
 - 13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
 - 13.00.03 Maxsus pedagogika
 - 13.00.04 Jismoniy tarbiya va sport mashg'ulotlari nazariyasi va metodikasi
 - 13.00.05 Kasb-hunar ta'limi nazariyasi va metodikasi
 - 13.00.06 Elektron ta'lim nazariyasi va metodikasi (ta'lim sohaları va bosqichlari bo'yicha)
 - 13.00.07 Ta'limda menejment
 - 13.00.08 Maktabgacha ta'lim va tarbiya nazariyasi va metodikasi
 - 13.00.09 Ijtimoiy pedagogika
 - 07.00.00 Tarix fanlari
 - 19.00.00 Psixologiya fanlari
 - 01.00.00 Fizika-matematika fanlari
 - 02.00.00 Kimyo fanlari
 - 03.00.00 Biologiya fanlari
 - 09.00.00 Falsafa fanlari
 - 10.00.00 Filologiya fanlari
 - 11.00.00 Geografiya fanlari



MAKTABGACHA VA MAKTAB TA'LIMI

Mas'ul muharrir: Ramzidin Ashurov

Ingliz tili muharriri: Murod Xoliyorov

Musahhih: Alibek Zokirov

Sahifalovchi va dizayner: Iskandar Islomov

2026. №5(5)

© Materiallar ko'chirib bosilganda "Maktabgacha va maktab ta'limi" jurnali manba sifatida ko'rsatilishi shart. Jurnalda bosilgan material va reklamalardagi dalillarning aniqligiga mualliflar ma'sul. Tahririyat fikri har vaqt ham mualliflar fikriga mos kelamasligi mumkin. Tahririyatga yuborilgan materiallar qaytarilmaydi.

"Maktabgacha va maktab ta'limi" jurnali 26.09.2023-yildan O'zbekiston Respublikasi Prezidenti Adminstratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligi tomonidan №C-5669363 reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan.
Litsenziya raqami: № 136361.

Manzirimiz: Toshkent shahar, Yunusobod tumani
19-mavze, 17-uy.