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- 13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
- 13.00.03 Maxsus pedagogika
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- 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

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MUNDARIJA

The Use of Innovative Pedagogical Technologies in the Development of Critical Thinking	16
<i>Gulnar Atakhanova Orinbaevna</i>	
Current Aspects of Designing and Implementing Extracurricular Educational Activities at the Primary General Education Level.....	20
<i>Amankosova Dinara Gabitovna</i>	
Maktabgacha ta'lim tizimida tarbiyachi shaxsiyati va kasbiy mahorati shakllanishining nazariy asoslari....	24
<i>Axmadaliyeva Moxlaroy To'xtapolatovna</i>	
Pedagogical Model and Stages of Teaching Subjects Through a Project-Based Approach	28
<i>Bannayev Qosimjon</i>	
Lotin tili va zamonaviy tibbiy terminologiya: tarixi, vazifasi va amaliy ahamiyati	31
<i>Eshmurodova Shirin Oybekovna</i>	
Motor alaliyaning nonutqiy simptomatikasi	34
<i>Isayeva Mushtariy Alisher qizi</i>	
Talabalar etnomadaniy kompetentligini rivojlantirishning pedagogik-psixologik omillari	38
<i>Isomiddinov Asliddin Baxriddin o'g'li</i>	
Texnologiya darslarida o'quvchilarning texnik savodxonligini robototexnika elementlari asosida rivojlantirish.....	41
<i>Jabborova Umida</i>	
Fizika fanini mutaxassislik fanlari integratsiyasi asosida o'qitishda bo'lajak muhandislarning kasbiy kompetentligini rivojlantirishning ilmiy-nazariy asoslari	45
<i>Xayrullayev Asliddin Isatullayevich</i>	
Talaba tomonidan mutaxassislik tilini o'zlashtirishda monologik nutqni o'rgatishning samarali usullari masalasi haqida.....	51
<i>Karimov N. M.</i>	
Zamonaviy pedagog kadrlar tayyorlashda kasbiy motiv va motivatsiyaning o'rni	54
<i>Melikova Einora Shuxratovna</i>	
Bo'lajak ingliz tili o'qituvchilarini tayyorlashda pragmatik kompetensiyaning roli.....	58
<i>Mustafayeva Nilufar Ulashovna</i>	
O'quvchilarda iqtisodiy tafakkurni rivojlantirishning pedagogik strategiyalari	62
<i>Nishonova Dilafuz</i>	
Computer-Based Formative Assessment: Advantages and Challenges in Teaching English to High School Students	66
<i>Obidjonova Shokhista Bakhtiyorovna</i>	
Metata'lim texnologiyalari asosida bo'lajak maktabgacha ta'lim mutaxassislarini tayyorlash tizimini takomillashtirish.....	70
<i>O'rolboyeva Durdona Sayfiddin qizi</i>	
Sun'iy intellekt asosidagi darslarning an'anaviy darslarga nisbatan samaradorligini qiyosiy tahlil qilish.....	73
<i>Rasulev Bobirjan Atxamovich</i>	
Pedagogik faoliyatda pedagogning kasbiy taraqqiyoti motivatsiyasining psixologik xususiyatlari	78
<i>Rustamova Surayyo Shaxobiddinovna</i>	
Innovatsion kompetentlik tushunchasi va uning ilmiy-pedagogik asoslari.....	84
<i>Soliyev Eliyor Ravshan o'g'li</i>	
Nutqida nuqsoni bo'lgan bolalar eshituv idrokini o'yinlar yordamida rivojlantirishning samarali usullari	88
<i>Xalilova Shahnoza</i>	
Zamonaviy ta'limda kommunikativ kompetensiyaning o'rni va ahamiyati.....	92
<i>Yaqubova Nigoraxon Ibrohimjon qizi</i>	
Soliq yuki – mamlakat soliq soliq tizimining asosiy mezonidir	97
<i>Suyunov Otabek Shuxrat o'g'li</i>	
Bo'lajak o'qituvchilarda kasbiy kompetensiyalarini rivojlantirish va takomillashtirish yo'llari	101
<i>Ibodova Sarvinoz Sayfilloyevna</i>	
Oliy ta'lim muassasalarida hospital pedagogika fanini o'qitishning dolzarb masalalari va uning uslubiy ta'minoti	106
<i>Inogamova Dilfuza Rahmatullaevna</i>	



Chizma geometriya va kompyuter grafikasi: an'anaviy fan va zamonaviy texnologiyaning uyg'unlashuvi .	111
Raximov A. M., Tairova N. S., Sabirova D. U., Xasanova S. T., Tashpulatov R. X.	
Геймификация в обучении английскому языку на начальном этапе обучения	114
Курбанова Назира Низомиддиновна	
Talabalarda tanqidiy va evristik fikrlashni shakllantirishda raqamli texnologiyalarning o'rni	117
Adjiev Nayrullo Nazrulloevich	
Konstruktiv yondashuv asosida tabiiy fanlar (science)ni o'qitish metodikasi.....	122
Amirullayeva Barno Abdulhaqovna	
Kimyo o'qitishda o'quvchilarning ijodiy faoliyatini shakllantirishning tajriba-sinov natijalari.....	126
Artiqov Maqsud Bahodirovich, Babanazarova Ayzada Omirbaevna	
Kichik maktab yoshidagi o'quvchilarni bilingvist sifatida shakllantirishda til o'rganish ko'nikmalari va kompetentsiyalarining rivojlanishi	131
Axmadjonova Gulira'no Muxtorjon qizi	
Talabalarining ijtimoiy kompetensiyalarini shakllantirishda kooperativ ta'limning metodik yondashuvlari.....	135
Botiraliyeva Gulobar Mahamadismoil qizi	
Talabalarni intellektual faoliyatga tayyorlashda ijtimoiy sherikchilikning pedagogik va metodik asoslari	139
Dilbarjonov Avazbek Ravshanbek o'g'li	
Teacher-Centered and Child-Centered Methods in Early Childhood Education: Insights From Finland and Uzbekistan	143
Djaparova Gulnoza	
Maktabgacha ta'lim tashkilotlarida "Metodik mahorat kuni" va "Metodik mahorat soati"ni tashkil etish	150
Do'stov Davron Zulhaydarovich	
Theoretical, Methodological, and Practical Factors of Differentiated Education	155
Ergash Shonazarovich Khasanov	
Maktabgacha yoshdagi bolalarning intellektual qobiliyatini rivojlantirishda kognitiv yondoshuv	160
Gulbahor Xamidova	
Mustaqil ta'lim – mustahkam bilim.....	164
Halima Shukurova Sunatullayevna	
Integrating Google Classroom and Project-Based Learning for Enhanced Synchronous and Asynchronous Education.....	168
Inomkhojaeva Shodiyakhon Abdukodirkhoja qizi	
O'quvchilarning innovatsion fikrlash ko'nikmalarini takomillashtirishning nazariy asoslari.....	174
Mamadaliyev Axadjon G'aniboyevich	
Hududiy rivojlanishda innovatsion yondashuvlarni strategik boshqaruvga integratsiya qilish yo'llari.....	177
Mo'minov Fazliddin Xusniddin o'g'li	
O'rta yoshdagi ayollarda harakat faoliyatini rivojlantirishda milliy o'yinlarning pedagogik ahamiyati	184
Mustafoev Sherali	
Pedagogical and Psychological Foundations of Developing Higher-Order Thinking Skills in Students.....	188
Nasimova Zarina Isomiddin kizi	
Pedagogik ijodkorlikning kasbiy professionallikda namoyon bo'lish xususiyatlari.....	193
Numonova Dildor Umurzoqovna	
Ko'zi oqiz boshlang'ich sinf o'quvchilarining kommunikativ kompetentsiyasini o'rganishning nazariy asoslari	196
Qarshiboyev Asliddin	
Maktabgacha ta'lim tashkilotlarida ta'lim-tarbiya jarayonini tashkil etish masalalari.....	200
Qilichova Marxabo Xudayqulovna	
The Transformation of Existential Thought in British Literature: Iris Murdoch's Philosophical Humanism and the Reinterpretation of Freedom	204
Rahmonqulova Zarnigor Nasimjon qizi	
Sportchilarning elektron platformalardan foydalanishning metodik tahlili	209
Saydullayev Zafar Erkinovich	
Adabiy ta'limda estetik tarbiya	216
Sharipov Elmurod Sa'dulla o'g'li	
O'qituvchi-trenerning ko'p qirrali kasbiy-pedagogik funksiyalari	220
Sulaymonov Jaxongir Solijonovich	
Uzluksiz kasbiy rivojlanishda art-pedagogikaning o'qituvchilar hissiy farovonligiga ta'siri	223
Suvanova Kamola Raimqul qizi	

Raqamlashtirish muhitida umumta'lim maktablarida ta'lim sifatini oshirish	226
<i>Xamidova Komila Maxmudovna</i>	
Oliy ta'limda kvest texnologiyasi yordamida fizika fanining murakkab tushunchalarini o'zlashtirish samaradorligini oshirish metodikasi.....	231
<i>Yo'ichiyev Shaxriyor Xusanovich, O'rinboyeva Kumushoy Sultonbek qizi</i>	
Совершенствование профессиональных компетенций будущих инженеров на основе интегративного подхода	235
<i>Умарова Гулчехра Абитовна</i>	
Kichik maktab yoshidagi o'quvchilarning aqliy qobiliyatining psixologik xususiyatlari	238
<i>Alanazarova Sholpan Artikbaevna, Artiqbaeva Miyassar Jumanazarovna</i>	
Biologiya ta'limida innovatsion metodlarni joriy etishda ta'lim menejmentining roli.....	241
<i>Allayorova Maloxat Normaxmat qizi</i>	
Integrating Innovative Technologies for the Enhancement of Speech and Communication Skills Among Learners With Intellectual Disabilities in Uzbekistan: Pedagogical Approaches and Developmental Outcomes	244
<i>Donisheva Gulruy Akhrorkulovna</i>	
Bo'lajak boshlang'ich sinf o'qituvchilarini o'quvchilar o'qish savodxonligini rivojlantirishga metodik jihatdan tayyorlash.....	247
<i>Doniyarov Mavlonbek Arabovich</i>	
Kimyoviy birikmalarda bog'lar sonini hisoblashning yangi matematik usullari.....	252
<i>Ergashev Vahob Ergashevich</i>	
Boshlang'ich sinf o'qituvchilarining mantiqiy tafakkurini rivojlantirish pedagogik muammo sifatida	257
<i>G'aniyeva Maftuna Abduaziz qizi</i>	
Pedagogika oliy o'quv yurtlarida steam fanlarini raqamli texnologiyalar asosida o'qitishning metodik asoslari	261
<i>Jamolova Sitara Muzaffar qizi</i>	
Boshlang'ich sinf o'quvchilarining matematik tafakkurini rivojlantirishda didaktik o'yinlar va interaktiv metodlardan foydalanish samaradorligi	264
<i>Mamadiyrov Jamol</i>	
Zamonaviy ta'lim jarayonida talabalar mustaqil faoliyatini rivojlantirishda pedagogik yondashuvlar.....	268
<i>Mamayusupova Nafisa Abdulatifovna</i>	
Para yengil atletikachilarda nayza uloqtirish texnikasini takomillashtirish uslubiyati	271
<i>Qiyomova Shohsanam Yarash qizi</i>	
Difficulties in Enhancing Communicativeness of Pre-Service English Teachers.....	275
<i>Kurbonova Maftuna Fakhriddinovna, Mirzayeva Gulshan Azamatovna</i>	
Principles of Teaching Basic Foreign Language Skills (EFL)	278
<i>Samandarova Gulsara Ismatilloevna</i>	
O'quvchilarning innovatsion ta'lim muhitida tayanch kompetensiyalarini shakllantirishning dolzarbligi	282
<i>Toshpulatova Farida Radjabovna</i>	
Корпоративная культура педагогов и внутренняя стабильность ДОО	286
<i>Буранова Шохноза Абдуразаковна</i>	
Развивать личностные качества учащихся на уроках географии.....	290
<i>Шадиева Нигора Шариповна</i>	
Raqamli texnologiyalar yordamida oliy ta'lim sifatini oshirishda innovatsion yondashuvlar	295
<i>Baytileuova Gulnaz Quralbay qizi</i>	
Yangi avlod pedagoglarini tayyorlash: kompetensiyalar va qadriyatlarining roli.....	298
<i>Ro'ziboyeva Ma'mura Abdunabiyevna</i>	
Astronomiya fanini o'qitishda integrativ yondashuvdan foydalanib o'qitishning ta'lim tizimidagi o'rni	301
<i>Barakayeva Sarvinoz To'liqunovna</i>	
Alohida e'tiborga muhtoj bolalar bilan ishlashda yangi pedagogik texnologiyalarni qo'llash.....	305
<i>Usmonov Salohiddin Dushan o'g'li, Namozova Sevinch Asqar qizi</i>	
Ma'naviy-axloqiy sifatlarni tarbiyalashda pedagogik qadriyatlarining ustuvorligi.....	310
<i>Jumayeva Gulnara Tursunpulatovna</i>	
Talabalarni maktabgacha ta'lim tashkilotlarini maqsadli boshqarishga tayyorlashning nazariy asoslari	314
<i>Mahmudova Zulfiya Xomitovna</i>	
Pedagogical Methodology Improve Students' Professional Mobility in Acquisition of Specialty.....	319
<i>Khidirova Muhabbat Murodillayevna</i>	

INTEGRATING INNOVATIVE TECHNOLOGIES FOR THE ENHANCEMENT OF SPEECH AND COMMUNICATION SKILLS AMONG LEARNERS WITH INTELLECTUAL DISABILITIES IN UZBEKISTAN: PEDAGOGICAL APPROACHES AND DEVELOPMENTAL OUTCOMES

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Teacher at Foreign languages department

Abstract: This article examines the integration of innovative technologies to enhance speech and communication skills among learners with intellectual disabilities in Uzbekistan. Drawing on pedagogical theory, assistive communication frameworks, and pilot classroom implementations, the study describes methods for adapting technology—such as augmentative and alternative communication (AAC) devices, tablet-based language apps, speech-generating applications, and multimodal interactive tools—within resource-constrained educational contexts. Results from small-scale implementations indicate improvements in expressive vocabulary, initiation of communicative acts, joint attention, and teacher-reported engagement. The discussion considers cultural and infrastructural barriers, training needs for teachers and families, and scalable models for inclusive practice in Uzbekistan. Recommendations emphasize participatory design, ongoing professional development, and policy-supportive steps to mainstream effective technology use.

Key words: intellectual disabilities, speech development, augmentative and alternative communication, assistive technology, inclusive education, Uzbekistan.

Annotatsiya: Ushbu maqolada O'zbekistonda aqliy rivojlanishida nuqsoni bo'lgan o'quvchilarda nutq va muloqot ko'nikmalarini rivojlantirish uchun innovatsion texnologiyalarni integratsiyalash masalalari ko'rib chiqiladi. Pedagogik nazariya, yordamchi kommunikatsiya (AAC) yondashuvlari hamda sinf amaliyotidagi pilot loyihalar asosida planshet ilovalari, nutq hosil qiluvchi dasturlar va multimodal interaktiv vositalarni resurslari cheklangan sharoitlarga moslashtirish usullari tavsiflanadi. Kichik miqyosdagi tadbiqotlar natijasida ifodaviy lug'at, kommunikatsiyani boshlash, birgalikda e'tibor qaratish hamda o'qituvchilar tomonidan baholangan jalb etilish darajasida ijobiy o'zgarishlar kuzatildi. Munozarada madaniy va infratuzilma to'siqlari, o'qituvchilar va oilalar uchun treninglar zaruriyati hamda kengaytiriladigan inklyuziv amaliyot modellari muhokama qilinadi. Tavsiyalar: ishtirokchi dizayn, uzluksiz kasbiy rivojlanish va siyosiy qo'llab-quvvatlash choralari ko'rish.

Kalit so'zlar: aqliy rivojlanish buzilishi, nutq rivoji, qo'shimcha va muqobil kommunikatsiya, yordamchi texnologiyalar, inklyuziv ta'lim, O'zbekiston.

Аннотация: В статье анализируется внедрение инновационных технологий для развития речи и коммуникативных навыков учащихся с интеллектуальными нарушениями в Узбекистане. На основе педагогической теории, подходов к вспомогательной коммуникации и пилотных внедрений описываются методы адаптации технологий – таких, как устройства дополнительных и альтернативных коммуникаций (AAC), планшетные языковые приложения, голосовые образующие программы и мультимодальные интерактивные инструменты – в условиях ограниченных ресурсов. Результаты небольших внедрений показывают улучшение продуктивного словаря, инициирования коммуникации, совместного внимания и вовлечённости по оценке учителей. В обсуждении рассматриваются культурные и инфраструктурные барьеры, потребности в обучении педагогов и семей, а также масштабируемые модели инклюзивной практики в Узбекистане. Рекомендации включают участие заинтересованных сторон в дизайне, постоянное повышение квалификации и шаги для поддержки политики по внедрению.

Ключевые слова: интеллектуальные нарушения, развитие речи, дополнительные и альтернативные способы коммуникации, вспомогательные технологии, инклюзивное образование, Узбекистан.



INTRODUCTION

Effective communication is a fundamental human right and a cornerstone of special and inclusive education. Learners with intellectual disabilities (ID) often experience delayed or atypical speech and language development, which can impede learning, social participation, and access to life opportunities. In recent years, technological innovations—ranging from low-cost tablet applications to advanced augmentative and alternative communication (AAC) systems—have demonstrated significant potential to support language acquisition, expressive communication, and social interaction among individuals with complex needs.

In countries such as Uzbekistan, where inclusive education is expanding rapidly and resource distribution varies considerably between urban and rural areas, the thoughtful integration of technology into pedagogical practice can substantially enhance learning outcomes for students with ID. When combined with targeted teacher training, active family involvement, and culturally adapted curricula, technology can serve as a catalyst for improving communication and inclusion. This article synthesizes relevant pedagogical approaches, outlines methods employed in small-scale pilot implementations, reports observed outcomes, and proposes practical pathways for scaling effective practices across Uzbekistan's educational system.

RESEARCH METHODOLOGY

This study synthesizes three lines of evidence:

- (1) literature-based pedagogical frameworks reflecting international best practices and AAC (Augmentative and Alternative Communication) principles;
- (2) design and implementation of pilot interventions in two mainstream and one special classroom in Uzbekistan; and
- (3) mixed-method monitoring using simple pre/post measures and qualitative teacher and family feedback.

The pilot phase involved 18 learners aged 6–14 years diagnosed with mild-to-moderate intellectual disabilities, enrolled across one regional special school and two inclusive classrooms in an urban district. Teachers ($n=7$) and family members ($n=12$) participated in orientation and follow-up activities to ensure consistent support and feedback throughout the implementation process.

Interventions were conducted over a 12-week period and integrated several complementary components designed to enhance communication and participation. Device-based AAC tools included low-cost speech-generating applications installed on tablets, adapted symbol sets featuring culturally relevant icons, and core vocabulary pages customized for Uzbek linguistic contexts. Tablet-assisted language activities comprised structured vocabulary and sentence-building applications used during short, daily 15–20-minute sessions. Multimodal classroom tools encompassed interactive whiteboard activities (where available), video modeling, and simple switch-activated toys to promote attention, engagement, and turn-taking. Teacher coaching was provided through weekly one-hour micro-trainings that focused on modeling, aided language stimulation, use of prompting hierarchies, and systematic data collection. Family engagement was supported through two workshops that introduced strategies for home-based practice using low-tech AAC tools such as picture exchange systems and communication books.

Data collection involved both quantitative and qualitative methods. Expressive vocabulary checklists were developed from classroom-specific language targets and administered before and after the intervention. Teacher logs were maintained to record the frequency of spontaneous communicative initiations per session. Engagement and social interaction were evaluated using teacher-rated Likert scales, while qualitative feedback from teachers and families was gathered through semi-structured interviews to capture perspectives on usability, motivation, and perceived outcomes. The mixed-method approach provided a comprehensive understanding of how technology-assisted communication strategies functioned in real classroom contexts and informed recommendations for broader application in Uzbekistan's inclusive education system.

ANALYSIS AND RESULTS

Across the 12-week period, aggregate outcomes demonstrated measurable improvement in targeted areas. Mean expressive vocabulary scores increased by approximately 28% compared with baseline targets selected for each learner. Several learners progressed from single-word use to two- or three-word combinations when supported by AAC prompting and modeling. Teacher logs documented a mean increase of 1.6 spontaneous communicative acts per 20-minute session (baseline average 0.9 → post 2.5). These initiations included requests, greetings, and attempts to draw peer attention. Teachers reported improved engagement (average Likert rating increased from 2.7 to 4.1 on a 5-point scale). Observed classroom behaviors included

longer attention spans during language activities and more sustained peer interactions. Teachers emphasized the value of visual supports and the motivational effect of interactive technology. Families reported that children used simple picture exchange or tablet apps at home, increasing opportunities for communication outside school. Challenges included intermittent power/connectivity in some settings, the need for culturally relevant pictorial libraries, and an initial lack of confidence among some teachers in operating devices.

The pilot findings align with international evidence that technology—when pedagogically embedded—can facilitate notable gains in communication for learners with intellectual disabilities (ID). Several pedagogical principles emerged as critical for success: Aided Language Stimulation and Modeling: Technology is most effective when teachers actively model its use rather than treating devices as passive rewards. Guided demonstrations of how to construct messages and combine symbols support generalization to natural speech. Cultural and Linguistic Relevance: Symbol sets, recorded voices, and scenario contexts must reflect the Uzbek language, family routines, and cultural norms to maximize comprehension and acceptance. Locally developed pictorial libraries proved more engaging than imported sets.

Teacher Capacity Building: Short, focused coaching sessions produced rapid gains in teacher confidence and fidelity. Peer coaching and in-class mentoring can sustain practices after the pilot phase. Family Involvement: Simple, low-tech adaptations (communication books, picture schedules) complemented high-tech tools at home, supporting transfer of skills across contexts. Resource Pragmatism: Given infrastructural variability, a hybrid technology approach (combining robust low-tech AAC with tablet-based apps where possible) offers the best balance of scalability and impact. Barriers identified—device maintenance, power outages, and initial resistance—are solvable with policy-level support (provision of chargers, offline-capable apps), investment in durable low-cost devices, and consistent professional development. Importantly, technology is not a stand-alone solution; pedagogical practices, curriculum adaptation, and inclusive classroom routines must accompany device deployment.

CONCLUSION

Integrating innovative technologies into pedagogical practice holds tangible promise for improving speech and communication outcomes among learners with intellectual disabilities in Uzbekistan. Small-scale implementations show meaningful improvements in vocabulary, communicative initiations, and classroom engagement when technology is embedded within evidence-based instructional strategies, supported by teacher coaching and family involvement. For sustainable, system-wide impact, policymakers and educational leaders should prioritize developing culturally appropriate AAC resources in Uzbek; funding teacher professional development programs; piloting hybrid low- and high-tech models across diverse settings; and facilitating partnerships between schools, universities, and technology providers. With coordinated action, technology-enhanced communication supports can become an integral part of inclusive education across Uzbekistan.

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- 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



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