

Informatika fanidan loyiha asosida o'qitish orqali amaliy ko'nikmalar va faollikni oshirish

Rashid Turgunbaev
Qo'qon davlat universiteti

Annotatsiya: Nazariy ta'lim va diskret dasturlash topshiriqlariga ko'p tayanadigan informatika ta'limining an'anaviy modeli uzoq vaqtdan beri akademik bilimlar va sanoat talablari o'rtasidagi tafovutni bartaraf eta olmagan uchun tanqidga uchragan. Bitiruvchilar ko'pincha kuchli nazariy asosga ega, ammo zamonaviy dasturiy ta'minotni ishlab chiqish muhitida talab qilinadigan amaliy ko'nikmalar, hamkorlik qobiliyatlari va muammolarni hal qilish qobiliyatiga ega emaslar. Ushbu maqola ushbu muhim bo'shliqni bartaraf etish uchun o'zgartiruvchi pedagogik asos sifatida Loyihaga asoslangan ta'limning tizimli integratsiyasi haqida bahs yuritadi. O'rganishni murakkab, haqiqiy va uzoq muddatli loyihalar kontekstida joylashtirish orqali Loyihaga asoslangan ta'lim bevosita amaliy ko'nikmalarni egallashni kuchaytiradi va talabalarning chuqur faolligini rivojlantiradi. Munozara konstruktivizm va situatsion ta'lim tamoyillariga e'tibor qaratgan holda PHLning nazariy asoslarini o'rganadi. Keyinchalik u Loyihaga asoslangan ta'lim nafaqat texnik ko'nikmalarni, balki muloqot, jamoada ishlash va loyihalarni boshqarish kabi muhim yumshoq ko'nikmalarni rivojlantiradigan maxsus mexanizmlarni belgilaydi. Bundan tashqari, hujjat universitet tuzilmalarida Loyihaga asoslangan ta'limni amalga oshirishga xos bo'lgan muammolarni hal qiladi va uni samarali qabul qilish uchun strategik mulohazalarni taklif qiladi. Asosiy tezis shundan iboratki, Loyihaga asoslangan ta'lim oddiy pedagogik texnikadan tashqariga chiqadi va passiv bilim oluvchilarni faol, faol va qobiliyatli dasturiy ta'minot muhandislariga aylantiruvchi muhim ko'priq bo'lib xizmat qiladi.

Kalit so'zlar: loyiha asosida o'qitish, informatika bo'yicha ta'lim, amaliy ko'nikmalar, talabalarning faolligi, oliy ta'lim, dasturiy ta'minotni ishlab chiqish

Enhancing practical skills and engagement through project based learning in computer science

Rashid Turgunbaev
Kokand State University

Abstract: The traditional model of computer science education, heavily reliant on theoretical instruction and discrete programming assignments, has long faced criticism for its failure to bridge the gap between academic knowledge and industry demands. Graduates often possess a strong theoretical foundation but lack the practical

skills, collaborative competencies, and problem-solving agility required in modern software development environments. This paper argues for the systematic integration of Project Based Learning (PBL) as a transformative pedagogical framework to address this critical gap. By situating learning within the context of complex, authentic, and long-term projects, PBL directly enhances practical skill acquisition and fosters profound student engagement. The discussion will explore the theoretical underpinnings of PBL, focusing on the principles of constructivism and situated learning. It will then delineate the specific mechanisms through which PBL cultivates not only technical proficiencies but also essential soft skills such as communication, teamwork, and project management. Furthermore, the paper will address the challenges inherent in implementing PBL within university structures and propose strategic considerations for its effective adoption. The central thesis is that PBL moves beyond being a mere pedagogical technique and serves as a vital bridge, transforming passive recipients of knowledge into active, engaged, and capable software engineering professionals.

Keywords: project based learning, computer science education, practical skills, student engagement, higher education, software development

Kirish

Raqamli asr kompyuter olimlarining yangi zotini talab qiladi. Texnologiyaning tez evolyutsiyasi va global dasturiy ta'minot bozorlarining murakkabligi nafaqat malakali koderlar, balki ijodiy muammolarni hal qiluvchi, samarali hamkorlik qiluvchi va umrbod o'rganuvchilar bo'lgan mutaxassislarni talab qiladi. O'nlab yillar davomida universitetning informatika bo'limlarida dominant paradigma ta'limning transmissiya modeli bo'lib kelgan. Ushbu modelda bilim o'qituvchidan talabaga ma'ruzalar orqali uzatiladigan tovar sifatida qaraladi, tushunish imtihonlar va kichik hajmdagi, ko'pincha alohida dasturlash mashqlari orqali tasdiqlanadi. Ushbu yondashuv algoritmlar, ma'lumotlar tuzilmalari va tizimlar arxitekturasidagi asosiy tushunchalarni samarali tarzda etkazsa-da, u ko'pincha o'quvchilarni dasturiy ta'minotni ishlab chiqishning tartibsiz, iterativ va hamkorlikdagi haqiqatiga tayyorlashda etarli emas.

Ushbu uzilishning natijasi yaxshi hujjatlashtirilgan ko'nikmalar bo'shlig'idir. Sanoat rahbarlari doimiy ravishda yangi bitiruvchilar, ularning ilmiy ma'lumotlariga qaramay, rivojlanish guruhlarining samarali a'zolari bo'lish uchun sezilarli qo'shimcha tayyorgarlikni talab qilishlari haqida xabar berishadi. Ular ko'p odamli kodlar bazasida versiyalarni boshqarish tizimlari bilan kurashishlari mumkin, katta, noaniq muammolarni boshqarilishi mumkin bo'lgan vazifalarga ajratishda tajribasi yo'q yoki real loyihalarni belgilaydigan talablarni yig'ish, loyihalash, amalga oshirish, sinovdan o'tkazish va joylashtirish davrlariga tayyor bo'lmashliklari mumkin. Bundan tashqari, talabalarning faolligi va uni saqlab qolish, ayniqsa, kompyuter fanlari darajasining muhim dastlabki yillarida, doimiy tashvishlar bo'lib qolmoqda. Dastlabki kurs ishining mavhum tabiati bu sohaning hayajonli salohiyatini yashirishi mumkin, bu esa ishdan bo'shatish va eskirishga olib keladi.

Aynan shu kontekstda Loyihaga asoslangan ta'lim kuchli antidot sifatida paydo bo'ladi. Loyihaga asoslangan ta'lim - bu loyihalar atrofida o'rganishni tashkil etadigan o'qitish metodologiyasi. Bular shunchaki o'quv birligini yakunlash uchun qo'shimchalar emas, balki o'qitish uchun markaziy vositadir. Haqiqiy Loyihaga asoslangan ta'lim o'zining murakkab, hayajonli savol yoki muammoga yo'naltirilganligi, doimiy so'rovga bo'lgan talabi, haqiqiy dunyo muammolariga nisbatan haqiqiyligi, talaba ovozi va tanloviga urg'u berishi va haqiqiy auditoriya uchun aniq mahsulot yoki taqdimot bilan yakunlanishi bilan tavsiflanadi. Ushbu maqola kompyuter fanlari bo'yicha ta'limga qo'llanilganda, an'anaviy modelning kamchiliklarini to'g'ridan-to'g'ri maqsad qilib qo'yganligi haqida gapirib beradi. Uning ta'kidlashicha, talabalarni dasturiy ta'minotni yaratishning haqiqiy amaliyotiga jalb qilish orqali Loyihaga asoslangan ta'lim bir vaqtning o'zida ularning amaliy ko'nikmalarining chuqurligi va qo'llanilishini oshiradi va passiv o'rganish erisha olmaydigan ichki motivatsiya va faollik darajasini oshiradi.

Loyihaga asoslangan ta'limning samaradorligi o'rnatilgan ta'lim nazariyalarida, birinchi navbatda, konstruktivizm va situatsion ta'limda chuqur ildiz otgan. Jan Piaget va Lev Vygotskiy kabi mutafakkirlar tomonidan qo'llab-quvvatlangan konstruktivistik paradigma ta'kidlaydiki, o'quvchilar bilimlarni passiv ravishda olmaydilar, balki ularni o'zlarining tajribalari va dunyo bilan o'zaro ta'siri orqali faol ravishda quradilar. An'anaviy informatika ma'ruzasida talabaga bog'langan ro'yxat haqida aytiladi. Loyihaga asoslangan ta'lim muhitida talaba bog'langan ro'yxat haqida tushuncha hosil qiladi, undan o'zlari qurayotgan video o'yindagi ishlash muammosini hal qilish yoki ilovadagi dinamik kontaktlar ro'yxatini boshqarish uchun foydalanish kerak. Bilim zarurat va qo'llash asosida qurilgan bo'lib, uni yanada mustahkam, moslashuvchan va chuqurroq tushunish imkonini beradi.

Konstruktivizmni to'ldiruvchi - bu Lave va Venger tomonidan ilgari surilgan situatsion ta'lim nazariyasi. Ushbu nazariya ta'kidlashicha, o'rganish tabiatan u sodir bo'lgan faoliyat, kontekst va madaniyat bilan bog'liq. Dasturiy ta'minotni yaratish kontekstidan tashqarida dasturlashni o'rganish quruqlikda suzishni o'rganishga o'xshaydi; asosiy tamoyillarni tushunish mumkin, ammo haqiqiy muhitda ishlash qobiliyati yo'q. Loyihaga asoslangan ta'lim kompyuter fanini o'rganishni professional amaliyotni aks ettiruvchi kontekstda to'g'ridan-to'g'ri joylashtiradi. Talabalar nafaqat Java yoki Pythonni o'rganmoqdalar; ular dasturiy ta'minot ishlab chiquvchisi bo'lishni o'rganmoqdalar. Ular noaniq talablar bilan kurashadilar, jamoadoshlari bilan dizayn qarorlarini muzokara qiladilar, kutilmagan xatolarga duch kelishadi va ularni tuzatadilar va kontseptual g'oyaning ishlaydigan tizimga aylanishini ko'rishdan mamnun bo'lishadi. Bu mavjud tajriba mavhum akademik tushunchalarni aniq, foydalanish mumkin bo'lgan vositalarga aylantiradi.

darajali topshiriqlar orqali rag'batlantirish, javob berish va mustahkamlash jarayoni sifatida qaraladi. Bixevioristik usullar sintaksisni eslab qolish uchun samarali bo'lishi mumkin bo'lsa-da, ular mutaxassis dasturchilar va dizaynerlarning o'ziga xos xususiyati bo'lgan tahlil, sintez va baholash kabi yuqori darajadagi kognitiv

qobiliyatlarni rivojlantirish uchun mos kelmaydi . Loyihaga asoslangan ta'lim, o'zining tabiatiga ko'ra, ushbu yuqori darajadagi ko'nikmalarni talab qiladi. Loyihada ishtirok etayotgan talaba muammoli sohani tahlil qilishi, informatikaning turli sohalaridagi bilimlarni sintez qilishi va o'z ishining sifati va samaradorligini doimiy ravishda baholashi kerak. Ushbu kognitiv jalb qilish chuqur o'rganish va barqaror motivatsiyaning asosiy omili hisoblanadi.

Informatika bo'yicha loyihaga asoslangan ta'limning eng to'g'ridan-to'g'ri va aniq foydasi amaliy, sanoatga tegishli ko'nikmalarni chuqur oshirishdir. Ushbu rivojlanish bir nechta o'lchamlarda sodir bo'lib, sintaktik jihatdan to'g'ri kod yozish qobiliyatidan ancha uzoqda.

Birinchidan, Loyihaga asoslangan ta'lim bilimlarni birlashtirishga majbur qiladi. Oddiy universitet o'quv dasturi alohida kurslarga bo'lingan: ma'lumotlar bazalari, algoritmlar, inson va kompyuter o'zaro ta'siri va tarmoq. Loyiha muhitida bu domenlar to'qnashadi. Funktsional veb-ilovani yaratish uchun, masalan, talaba ma'lumotlar bazasi mantig'ini, ma'lumotlarni qayta ishlash uchun samarali algoritmlarni, puxta ishlab chiqilgan foydalanuvchi interfeysini va tarmoq aloqa protokollarini muammosiz birlashtirishi kerak. Ushbu integratsiya kognitiv sakrash bo'lib, diskret topshiriqlarga yordam bera olmaydi. Talabalar nafaqat alohida mavzularni, balki eng muhimi, ularning qanday o'zaro bog'liqligini va bir-biriga bog'liqligini to'liq tizimda o'rganadilar. Ushbu tizimli tushuncha professional dasturiy ta'minot muhandisligining asosidir.

Ikkinchidan, Loyihaga asoslangan ta'lim professional vositalar va ish oqimlarini qabul qilishni talab qiladi. Talaba sinf topshirig'i uchun Integrated Development Environment (IDE) dan foydalanishi mumkin bo'lsa-da, katta hajmdagi loyiha Git kabi versiyalarni boshqarish tizimlaridan foydalanishni mutlaqo zaruratga aylantiradi. Talabalar filiallarni boshqarishni, birlashma mojarolarini hal qilishni va umumiy kod bazasida hamkorlik qilishni o'rganadilar. Ular qurish vositalari, qaramlik menejerlari va uzluksiz integratsiya quvurlari bilan shug'ullanishga majbur. Ular murakkab tizimlarni disk raskadrovka qilish haqiqatiga duch kelishadi, bunda xatoning manbai bitta noto'g'ri qo'yilgan nuqta-vergul emas, balki bir nechta modullar o'rtasidagi nozik o'zaro ta'sirdir. Ular dasturiy ta'minotning ishonchliligini ta'minlash uchun tizimlarni sinovdan o'tkazish, birlik testlarini yozish, integratsiya testlari va hatto oxirigacha testlar bilan tajriba orttirishadi. Bular odatda maxsus ma'ruzada o'qitiladigan ko'nikmalar emas; ular loyiha muvaffaqiyati imperativi orqali olingan ko'nikmalardir.

Uchinchidan, va, ehtimol, eng muhimi, Loyihaga asoslangan ta'lim muammolarni ajratish va loyihani boshqarishning meta-ko'nikmalarini rivojlantiradi. Katta, ochiq-oydin muammo bayoni bilan duch kelgan talabalar uni kichikroq, boshqariladigan xususiyatlar va vazifalarga ajratishni o'rganishlari kerak. Bu jarayon dizayn hujjatlarini, arxitektura diagrammalarini va foydalanuvchi hikoyalarini yaratishni o'z ichiga oladi. Ular vaqt jadvallari hisoblashlari, resurslarni taqsimlashlari va ko'pincha jamoaning bir qismi sifatida o'zlarining ish jarayonlarini boshqarishlari

kerak. Dasturiy ta'minot loyihasini boshqarish asoslari bilan tanishish bebahodir. U kodlash harakatini bir qator izolyatsiya qilingan boshqotirmalardan inson ehtiyojlarini hal qilishning tizimli jarayoniga aylantiradi. Talaba dasturiy ta'minotni ishlab chiqishning muhim qismi klaviaturada emas, balki doskada, rejalashtirish yig'ilishlarida va dizayn hujjatlarida sodir bo'lishini bilib oladi.

Texnik mahoratning aniq rivojlanishi bilan bir qatorda, loyihaga asoslangan ta'lim talabalarning faolligi va motivatsiyasiga kuchli ta'sir ko'rsatadi. Ma'ruza ishtirokchisining passiv roli ijodkorning faol roli bilan almashtiriladi, bu kuchli ichki motivatsion kuchlarga ta'sir qiladi.

Ushbu kelishuvning asosiy omili avtonomiya va egalikdir. Yaxshi ishlab chiqilgan Loyihaga asoslangan ta'lim tajribasida talabalarga loyihada ovoz va tanlov darajasi beriladi. Ular o'z ilovalarining o'ziga xos domenini tanlashlari, ishlatmoqchi bo'lgan texnologiyalarni tanlashlari yoki foydalanuvchi interfeysi dizaynida erkinlikka ega bo'lishlari mumkin. Bu egalik loyihani yuklangan vazifadan shaxsiy harakatga aylantiradi. Talaba endi faqat bitta baho uchun ishlamaydi; ular o'z qarashlarini hayotga tatbiq etish uchun harakat qilmoqdalar. Ularning yaratilishi muvaffaqiyatli bo'lishini ko'rish uchun hissiy sarmoya standart topshiriqni bajarishda kamdan-kam uchraydigan qat'iyatlilik va majburiyat darajasini oshiradi. Talabalar ko'pincha o'z loyihalari ustida kechgacha ishlayotganliklari haqida xabar berishadi, bu muddat yaqinlashib qolgani uchun emas, balki ularni qiyinchilik va ijodiy jarayonga chin dildan jalb qilgani uchun.

Bundan tashqari, Loyihaga asoslangan ta'lim haqiqiy maqsad tuyg'usini ta'minlaydi. O'rganish ortida turgan "nima uchun" har doim ko'rinadi. Soket dasturlashni o'rganayotgan talaba buni viktorinadan o'tish uchun qilmayapti; ular buni ko'p o'yinchi o'yinida yoki chat ilovasida real vaqt rejimida muloqot qilishni o'rganmoqdalar. Nazariy kontseptsiya va uni ular qiziqtiradigan loyihada amaliy qo'llash o'rtasidagi aniq ko'rinish o'rganishni dolzarb va mazmunli qiladi. Bu talabalarning oddiy nolasiga qarshi: "Men buni qachon ishlataman?" javobni real vaqt rejimida ko'rsatish orqali. Bu dolzarblik ajralish va apatiyaga qarshi kuchli antidotdir.

Loyihaga asoslangan ta'lim ning ijtimoiy jihatini ham ishtirok etishni sezilarli darajada oshiradi. Muhim loyihada jamoalarda ishlash professional dunyoning hamkorlik tabiatini aks ettiradi. Ushbu hamkorlik talabalar bir-biridan o'rganadigan va o'rgatadigan amaliyot hamjamiyatini yaratadi. Ular tengdosh dasturlash, kodlarni ko'rib chiqish va muammolarni jamoaviy hal qilish bilan shug'ullanadilar. Ushbu ijtimoiy ta'lim muhiti nafaqat tushunishni chuqurlashtiradi, balki do'stlik va umumiy maqsad tuyg'usini ham shakllantiradi. Sinf xonasi baholar uchun raqobatlashadigan shaxslar to'plami bo'lishni to'xtatadi va umumiy ijodiy maqsadlar yo'lida ishlaydigan ishlab chiquvchilarning hamkorlikdagi studiyasiga aylanadi. Tayyor mahsulotni auditoriyaga taqdim etish imkoniyati, xoh u tengdoshlar, xoh o'qituvchilar, xoh potentsial sanoat hamkorlari bo'lsin, mas'uliyat va g'urur tuyg'usini oshiradi, bu esa butun tajribani yanada oshiradi.

O'zining muhim afzalliklariga qaramay, loyihaga asoslangan ta'limni universitet kompyuter fanlari o'quv dasturiga integratsiyalashuvi jiddiy muammolardan holi emas. Muvaffaqiyatli amalga oshirish uchun ushbu to'siqlarni tan olish va strategik jihatdan hal qilish juda muhimdir.

Eng jiddiy muammolardan biri miqyoslash va resurslarni taqsimlash masalasidir. Loyihaga asoslangan ta'lim an'anaviy ma'ruzaga asoslangan o'qitishdan ko'ra ko'proq resurslarni talab qiladi. Loyihalarga ko'maklashish mazmunli yo'l-yo'riq va fikr-mulohazalarni ta'minlash uchun talaba-o'qituvchi nisbati pastligini talab qiladi. O'qituvchining roli "sahnadagi donishmand" dan "yon tomondagi gid" ga o'tadi, bu esa har bir talaba uchun boshqa mahorat va ko'proq vaqtni talab qiladi. Universitetlar professor-o'qituvchilar tarkibini rivojlantirishga sarmoya kiritishga tayyor bo'lishi va sinf o'lchamlari va o'quv yuklarining tarkibiy ta'sirini hisobga olishi kerak.

Baholash yana bir murakkab muammoni keltirib chiqaradi. An'anaviy imtihonni baholash nisbatan sodda; ko'p haftalik jamoaviy loyihaning jarayoni va mahsulotini baholash ancha nozik. Kuchli baholash strategiyasi nafaqat yakuniy kodni, balki dizayn jarayonining sifatini, jamoaviy ish samaradorligini, hujjatlarning aniqligini va har bir talabaning individual hissasini baholashi kerak. Bu ko'pincha rubrikalar, tengdoshlarni baholash, o'z-o'zini baholash va aks ettiruvchi komponentlarning kombinatsiyasini talab qiladi, ularning barchasi adolatli va samarali bo'lishi uchun ehtiyotkorlik bilan loyihalash va kalibrlashni talab qiladi.

Nihoyat, mustahkam poydevor bilimini ta'minlash muammosi mavjud. Birinchi kundan boshlab sof loyihaga asoslangan o'quv dasturi talabalarning asosiy nazariy tushunchalarni tushunishida bo'shliqlar qoldirish xavfini tug'diradi. Eng samarali yondashuv ko'pincha gibril yoki iskala hisoblanadi. Dastlabki kurslar asosiy tushunchalar bo'yicha qisqa, yo'naltirilgan ma'ruzalarni kichikroq loyihalarda darhol qo'llash bilan birlashtirishi mumkin. Talabalar o'sishi bilan muvozanat o'zgarishi mumkin, yuqori darajadagi kurslar asosan yoki butunlay loyihaga asoslangan. Bu talabalarga murakkab tizimlarni qurish topshirig'ini berishdan oldin zarur qurilish bloklariga ega bo'lishini ta'minlaydi, shu bilan birga Loyihaga asoslangan ta'lim metodologiyasining keng afzalliklaridan foydalanadi.

Xulosa

Informatika ta'limining rivojlanishi uchun zaruriy narsa aniq. Sanoat endi faqat algoritmik bilimlar ombori bo'lgan bitiruvchilarga muhtoj emas; unga epchil, amaliy va faol muammolarni hal qiluvchilar kerak. Loyihaga asoslangan ta'lim ushbu ehtiyojni qondirish uchun mustahkam va nazariy asosni taklif qiladi. O'quv jarayonini murakkab, haqiqiy loyihalarga bog'lash orqali Loyihaga asoslangan ta'lim dasturiy ta'minot kasbining valyutasi bo'lgan amaliy ko'nikmalarni bevosita oshiradi. Bu bilimlarni integratsiyalashuviga, professional vositalar bilan tanishishga va loyihalarni boshqarish va dizayndagi malakaga yordam beradi.

Shu bilan birga, u egalik, maqsad va hamkorlikning kuchli kuchlari orqali talabalarning faolligini kuchaytiradi. U sinfni passiv ma'ruza zalidan dinamik studiyaga aylantirib, sohaning hamkorlik va ijodiy haqiqatlarini aks ettiradi. Keng

tarqalgan qabul qilish yo'li resurslar, baholash va o'quv dasturlarini loyihalash bilan bog'liq qiyinchiliklarga to'la bo'lsa-da, bu sarmoyaning potentsial daromadi juda katta. Bu nafaqat texnik jihatdan malakali, balki texnologik landshaftga mazmunli hissa qo'shish uchun chinakam tayyor, g'ayratli va ilhomlangan kompyuter olimlarining yangi avlodini etishtirishdir. Shu sababli, loyihaga asoslangan ta'limni periferik ta'lim tajribasi sifatida emas, balki zamonaviy va samarali informatika ta'limining markaziy, muhim tarkibiy qismi sifatida ko'rish kerak.

Foydalanilgan adabiyotlar

1. Xo'jjiyev, M. Y., & Bozorova, F. J. R. (2025). Antioxidant properties of pumpkin seed oil addition to functional drinks. *Academic Journal of Science, Technology and Education*, 1(7), 40-42.
2. Muminov, M. (2025). Cultivating the complete musician in the piano studio. *Academic Journal of Science, Technology and Education*, 1(7), 16-20.
3. Asatullayev, R. B., & Latifova, S. N. (2025). The lymphatic system. *Academic Journal of Science, Technology and Education*, 1(7), 43-44.
4. Eralieva, F. E. (2025). An approach to the formation of the piano repertoire based on national and world music samples. *Academic Journal of Science, Technology and Education*, 1(7), 21-25.
5. Ergasheva, N. N., & Ergashaliyev, S. D. (2025). The role of gut microflora in postoperative adaptation and necrotizing enterocolitis risk following congenital intestinal obstruction. *Academic Journal of Science, Technology and Education*, 1(7), 56-59.
6. Yuldashev, K. (2025). Genre and performance style in theater art. *Academic Journal of Science, Technology and Education*, 1(7), 45-49.
7. Madaminjonovna, M., & Uzoqjonov, M. (2025). The possibilities of solving environmental problems through technology. *Academic Journal of Science, Technology and Education*, 1(7), 11-15.
8. Ahmedov, A. B. (2025). The emergence of digital platforms in Uzbekistan's economy and their impact on market competition. *Academic Journal of Science, Technology and Education*, 1(7), 6-10.
9. Jurayev, I. (2025). Vocal pedagogy in the academy integrating Uzbek traditional practices. *Academic Journal of Science, Technology and Education*, 1(7), 30-35.
10. Jurayeva, M. A. (2025). The formation of Uzbek journalism at the beginning of the 20th century. *Academic Journal of Science, Technology and Education*, 1(7), 63-65.
11. Shomuradova, D. A. (2025). Effective use of authentic materials in developing professional communicative skills. *Academic Journal of Science, Technology and Education*, 1(7), 53-55.
12. Ergasheva, N. N., & kizi Ruzikulova, K. N. (2025). Features of the course of iron deficiency conditions and risk factors for their development in children of the first year of life. *Academic Journal of Science, Technology and Education*, 1(7), 26-29.

13. oglu Nematov, F. N. (2025). Building effective collaboration between teachers and parents in primary school. *Academic Journal of Science, Technology and Education*, 1(7), 60-62.
14. Abdusalimova, A. (2025). Improving the effectiveness of fine arts lessons through innovative pedagogical technologies. *Academic Journal of Science, Technology and Education*, 1(7), 36-39.
15. Yuldashev, A. (2025). Performance on Uzbekistan folk instruments: opportunities and prospects. *Academic Journal of Science, Technology and Education*, 1(7), 3-5.
16. Arzikulov, F., & Komiljonov, A. (2025). The role of artificial intelligence in personalized oncology: predictive models and treatment optimization. *Academic Journal of Science, Technology and Education*, 1(6), 24-33.
17. Rustamov, M. (2025). The importance of cultural and art institutions in the development of the tourism sector (on the example of the activities of theaters and cultural centers). *Academic Journal of Science, Technology and Education*, 1(6), 70-74.
18. Arzikulov, F., & Komiljonov, A. (2025). AI-powered diagnostic systems in radiology: enhancing precision, speed, and clinical decision-making. *Academic Journal of Science, Technology and Education*, 1(6), 16-23.
19. Turgunbaev, R. (2025). Enhancing student understanding of artificial intelligence through practical neural network applications. *Academic Journal of Science, Technology and Education*, 1(6), 36-40.
20. Abdusattarova, M. (2025). The art of leadership. *Academic Journal of Science, Technology and Education*, 1(6), 4-7.
21. Mirzakarimova, M., & Uzoqjonov, M. (2025). Information security in information-communication technologies. *Academic Journal of Science, Technology and Education*, 1(6), 8-11.
22. Kim, Y. S. (2025). Metaphor as a means of shaping the concept 'narcissistic parent' in Karyl McBride's *Will I ever be good enough? Healing the daughters of narcissistic mothers*. *Academic Journal of Science, Technology and Education*, 1(6), 41-44.
23. Uzoqov, I. E., Abdisattorov, D. N., & Yusupov, B. B. (2025). The role and prospects of digitalization, standardization and technical regulation in the field of conformity assessment. *Academic Journal of Science, Technology and Education*, 1(6), 55-58.
24. Tokhirov, F. J. (2025). Enhancing algorithmic thinking skills for application development: a methodological approach in programming education. *Academic Journal of Science, Technology and Education*, 1(6), 75-81.
25. Karriyeva, Y. (2025). The use of international logistics in the development of foreign trade. *Academic Journal of Science, Technology and Education*, 1(6), 91-94.

26. Nasirova, G. R. (2025). Understanding structural changes in the respiratory tract in chronic disease. *Academic Journal of Science, Technology and Education*, 1(6), 82-85.
27. Masharipova, S. A. (2025). Prospects for the use of digitalization in the effective financial management of the chemical industry. *Academic Journal of Science, Technology and Education*, 1(6), 95-98.
28. Ergasheva, G. N. (2025). Storytelling method in teaching English to preschool children. *Academic Journal of Science, Technology and Education*, 1(6), 63-65.
29. Kamalova, A. (2025). Shukur Khollmirzaev's essay "That person is a mentor, and I am a disciple", its composition, plot, and system of characters. *Academic Journal of Science, Technology and Education*, 1(6), 48-50.
30. Mahmudova, D. Q. (2025). Effectiveness of microfertilizers in corn cultivation. *Academic Journal of Science, Technology and Education*, 1(6), 51-52.
31. Tokhtayev, I., & Ganiyeva, F. (2025). Opportunities for organic potato cultivation. *Academic Journal of Science, Technology and Education*, 1(6), 66-69.
32. Eraliyeva, M. T. K. (2025). Constitutional rights of citizens in the field of social security and their guarantees. *Academic Journal of Science, Technology and Education*, 1(6), 53-54.
33. oğlu İdiyev, B. B., & Khujakulov, K. R. (2025). Synthesis and kinetic regularities of copolymers based on styrene and nitrogen-containing methacrylic monomers. *Academic Journal of Science, Technology and Education*, 1(6), 99-104.
34. qizi Haydarova, S. A. (2025). Electromagnetism. *Academic Journal of Science, Technology and Education*, 1(6), 34-35.
35. qizi Xurramova, S. Q. (2025). Neurolinguistics: Comparative study of language processing in English and Uzbek. *Academic Journal of Science, Technology and Education*, 1(6), 12-15.
36. qizi Kenjayeva, Z. S. (2025). Advantages of modern methodology in forming phonetic competence in primary school students. *Academic Journal of Science, Technology and Education*, 1(6), 59-62.
37. qizi Vakilova, S. T. (2025). Technological factors influencing the antioxidant activity of mulberry leaf tea. *Academic Journal of Science, Technology and Education*, 1(6), 45-47.
38. Egamberdiyeva, Z. (2025). Innovative approaches to teaching librarianship in the digital age. *Academic Journal of Science, Technology and Education*, 1(5), 7-11.
39. Ibatova, N. I. (2025). Pedagogical Approaches and Methods to Enhance the Effectiveness of Developing Students' Artistic and Figurative Thinking. *Academic Journal of Science, Technology and Education*, 1(5), 46-49.
40. Santos, A. J. (2025). The Role of Behavioral Insights in Economic Decision Making Education. *Academic Journal of Science, Technology and Education*, 1(5), 39-42.
41. oğlu Abdurakhmonov, D. M. (2025). Fungal diseases of grapes and measures to combat them. *Academic Journal of Science, Technology and Education*, 1(5), 43-45.

42. qizi Sultonmurotova, S. M. (2025). Effectiveness and development prospects of digital-pedagogical integration in English language education. *Academic Journal of Science, Technology and Education*, 1(5), 16-20.
43. ogli Akbarov, B. T. (2025). Developing a Model for Preparing Future Music Teachers for Pedagogical Activity Based on Personality-Oriented Educational Technology. *Academic Journal of Science, Technology and Education*, 1(2), 8-10.
44. kizi Abdumutalova, M. A. (2025). Psychological aspects of divorce. *Academic Journal of Science, Technology and Education*, 1(2), 58-61.
45. qizi Nasirdinova, G. D. (2025). Technologies for developing students' leadership skills. *Academic Journal of Science, Technology and Education*, 1(2), 35-38.
46. ugli Mamasaidov, L. P. (2025). From the history of the public education system in Uzbekistan in the years of independence. *Academic Journal of Science, Technology and Education*, 1(2), 30-34.
47. qizi Azamova, N. Z. (2025). Semantic and paradigmatic relations in disease nomenclature. *Academic Journal of Science, Technology and Education*, 1(2), 39-41.
48. ugli Ibragimov, U. N., & qizi Muzropova, F. I. (2025). Formation of cartographic competence of future geography teachers. *Academic Journal of Science, Technology and Education*, 1(2), 25-29.
49. Egamberganova, Z. (2025). The digitally empowered library. *Technical Science Integrated Research*, 1(5), 29-35.
50. Turgunbaev, R. (2025). A project-based learning framework for teaching distributed data processing. *Technical Science Integrated Research*, 1(5), 3-7.
51. Makhkamova, G. T. (2025). Clinical and diagnostic features of respiratory diseases of combined etiology in children. *Technical Science Integrated Research*, 1(5), 21-24.
52. Xo'jjiyev, M. Y., & Bozorova, F. J. R. (2025). The role of pumpkin seed oil in slowing lipid oxidation in functional beverages and its kinetic models. *Technical Science Integrated Research*, 1(5), 25-28.
53. Tajibayev, B. J. (2025). Methods of providing psychological assistance to children after an earthquake. *Technical Science Integrated Research*, 1(5), 36-38.
54. qizi Valijonova, H. S. (2025). Innovative approach to the implementation of bim technologies in architectural and urban planning projects. *Technical Science Integrated Research*, 1(5), 12-16.
55. qizi Nabijonova, C. I. (2025). The formation of pilgrimage tourism under the influence of natural factors. *Technical Science Integrated Research*, 1(5), 17-20.
56. Boboyev, V. (2025). MICROTONAL INTONATION AND ORNAMENTATION IN THE KASHKAR RUBAB MAQOM REPERTOIRE. *European Review of Contemporary Arts and Humanities*, 1(4), 35-44.
57. Egamberganova, Z. (2025). INTEGRATING RFID WITH SMART SHELVES AND ROBOTIC RETRIEVAL SYSTEMS FOR THE AUTONOMOUS LIBRARY. *European Review of Contemporary Arts and Humanities*, 1(4), 45-50.

58. Mustafoev, S. M. (2025). THE INTERCONNECTION BETWEEN SOUNDS, MUSICAL MEMORY, AND THE SENSE OF MELODY AND HARMONY. *European Review of Contemporary Arts and Humanities*, 1(4), 3-8.

59. Mustafoev, S. M. (2025). THE LOCALIZATION OF THE FRONTAL AND PARIETAL AREAS OF REPRODUCTION IN CLASSICAL ARTISTS AND MUSICIANS. *European Review of Contemporary Arts and Humanities*, 1(4), 9-13.

60. Ma'murjon qizi Khatamkulova, Z. (2025). CHALLENGES OF IMPLEMENTING STEAM IN ENGLISH LANGUAGE CLASSES. *European Review of Contemporary Arts and Humanities*, 1(4), 14-17.

61. Xo'jjiyev, M. Y., & Bozorova, F. J. R. (2025). METROLOGICAL LIMITS OF ACCURACY OF PUMPKIN SEED OIL ADDITION TO FUNCTIONAL DRINKS. *European Review of Contemporary Arts and Humanities*, 1(4), 23-26.

62. ogli Oktyabrov, M. A. (2025). THE EMOTIONAL EXPRESSION OF ARTISTS THROUGH COLORS AND THE PSYCHOLOGICAL EFFECT OF COLORS IN ARTWORKS. *European Review of Contemporary Arts and Humanities*, 1(4), 30-34.