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“Kuntug‘mish” dostonining yozib olinishi, nashr etilishi va ilmiy tadqiq qilinishi tarixi

SamDU filologiya fakulteti

O‘zbek tili va adabiyoti yo‘nalishi

magistranti Rajabova Gulyora Sanjarovna

maqolada xalqimizning eng qadimiy hayotbaxsh ma’naviy qadriyatlaridan biri hisoblangan dostonchilik, o`zbek xalq baxshilari repertuarida alohida o`rin tutgan “Kuntug`mish” dostoni va uning mavjud variantlar aniqlanib, ularning yozib olinishi, nashr etilishi hamda ilmiy tadqiq qilinishi tarixi haqida ma’lumotlar keltirilgan. Shuningdek, maqolada “Kuntug`mish” dostoni variantlarining eng mukammal va badiiy jihatdan yuksak namunaga ega bo‘lgan varianti aniqlanib, izohlangan.

Kalit so‘zlar:doston, variant, obraz, folklorshunoslik, inventar, baxshi, syujet, epos, motiv, versiya .

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История написанияб публикации и исследования эпоса “Кунтугмыш”

Аннотация:*В данной статье описывается история написанияб издания и исследования эпоса “Кунтугмыш”, который является одной из древнейших духовных ценностей нашего народа, зфнимает особое место в репертуаре узбекских народных певцов и его вариантов. В статье также выявлена и объяснена наиболее совершенная и художественно совершенная версия упоса “Кунтугмыш”.*

Ключевые слова : *эпос, вариант, образ, фольклор, инвентарь, бакши, сюжет, эпос, мотив, вариант.*

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History of the writing, publication and research of the epic "Kuntugmish"

Keywords: *epic, variant, image, folklore, inventory, baxshi, plot, epic, motif, version*

Annotation: *this article describes the history of writing, publishing and research of the epic "Kuntugmish" is one of the most ancient spiritual values of our people, a special place in the repertoire of Uzbek folk poets and its variants. Data are given. The article also identifies and explains the most perfect and artistically advanced version of the epic "Kuntugmish".*

O'zbek xalq baxshilari epik repertuarida muhim o'rin tutadigan ishqiy-romantik dostonlarda sevgi mojarolari, sarguzashtli voqealar tasviriga alohida e'tibor beriladi. Ularda voqea-hodisalarni lirik yo'nalish asnosida tasvirlash an'ansi ustuvorlik qiladi. Baxshilar badiiy dahosining nodir mo'jizalaridan biri "Kuntug'mish" dostoni shunday asarlardandir. "Kuntug'mish" dostonida, bir tomondan, ko'ngilda muhabbat g'unchasi gul ochgan ikki yoshning achchiq qismati, boshidan o'tkazgan ruhiy iztiroblari yorqin dramatik lavhalarda gavdalantirilsa, ikkinchidan, ana shu og'ir qismat sinovlarida ham yoqin kelajakka ishonch yog'dusi nur taratib turadi. O'zining syujet tuzilishi va kompozitsion qurilishi jihatidan o'zbek xalq dostochiligida favqulotda o'rin tutgan bu doston Ergash Jumanbulbul o'g'li, Nurmon Abduvoy o'g'li, Islom shoir Nazir o'g'li, Bekmurod Jo'raboy o'g'li, Egamberdi Ollomurod o'g'li, Zohir shoir Qo'chqor o'g'li, Alim baxshi Haqqulov, Ro'zimbek Murodov, Qodir baxshi Rahimov kabi baxshilardn yozib olingan. Umumiy epik rivoya, syujet va motivlari jihatidan bir- biriga o'xshash bo'lgan bu variantlar orasida Ergash shoir nusxasi badiiy go'zalligi, kompozitsion

pishiqligi bilan ajralib turadi. Zulm va zo‘rlik bilan bir-biridan ajratilgan oshiq-mashuqlar taqdiri, adolatsiz zamon to‘fonida ota-onasidan va bir-biridan ajralib qolgan egizaklar sarguzashti Ergash shoir variantida turli- tuman ijtimoiy hodisalar fonida nihoyatda konkret va real tasvirlangan. Bu variant O‘zbek tili va adabiyoti ilmiy tadqiqot instituti Folklor arxivida 11-inventar raqami ostida saqlanadi. Bu dostonni mashhur folklor to‘plovchi Muhammad Isa Ernazar o‘g‘li 1926-yilda yozib olgan. Doston 22x35 o‘lchamdagi sarg‘ish tusli yo‘l-yo‘l qog‘ozga arab alifbosiga asoslangan eski o‘zbek yozuvida siyoh bilan yozilgan bo‘lib, hajmi 80 sahifadan iborat.

Doston qo‘lyozmasining oxirgi sahifasida mazkur asarni yozib olish ishi tugallangan 1926- yil 5- avgust sanasi ko‘rsatilgan. Shu sahifada yozib oluvchining ushbu izohi mavjud: “Ushbu dostonni Zarafshon viloyatining Nurota tumanining Jo‘sh kentining Qorakisa urug‘i Qo‘rg‘on qishloq fuqarosi Ergash Jumanbulbul o‘g‘lining og‘zidan 1926-yil 5-aprel oyidan boshlab, 1926- yil 5-avgust oyinda mazkur kishining og‘zidan eshitib yozdim. Mazkur kishining otasi bir avom bo‘lib, o‘zi shoirlikda mumtoz bo‘lgan bir kishi ekan. Ammo o‘g‘illarining so‘zlari asli o‘zbek tilinda bo‘lib, lekin bazi birlarida, ehtimoli bor, siyoyi til aralashib ketgan bo‘lsa avfu karam bilan yuvib ketmoqlarini so‘raymiz”, deb Muhammad Isa Ernazar o‘g‘li. 1926-yil”.[1]

Ergash Jumanbulbul o‘g‘li repertuaridagi “Kuntug‘mish” dostonidan ayrim parchalar dastlab atoqli olim Hodi Zarifovning “O‘zbek folklori” xrestomatyasida chop ettirildi. Mazkur doston 1949-yilda xassos olim Buyuk Karimiy tamonidan alohida nashrga tayyorlanib, H.Zarifovnining so‘zboshisi bilan alohida kitob holida nashr etilgan.[2]1955-yilda dostonning Ergash Jumanbulbul o‘g‘li va Nurmon Abduvoy o‘g‘li variantlari asosida folklorshunos H.Zarifov tomonidan tayyorlangan yig‘ma variant bosib chiqarildi. Bu na’muna 1958- yilda alohida kitob shaklida, shuningdek, “O‘zbek

[1]Ergash Jumanbulbul o‘g‘li. Kuntug‘mish(doston)/O‘zbek xalq ijodi yodgorliklari(nashrga tayyorlovchilar: Hodi Zarifov,Zubayda Husanova,Mamatqul Jo‘rayev). –Toshkent,2016. 497-bet

[2] Ergash Jumanbulbul o‘g‘li. Kuntug‘mish(doston). Nashrga tayyorlovchi: Buyuk Karimiy.- Toshkent, 1949.

xalq dostonlari" ikki jild tarkibida ham qayta chop etildi. Bundan tashqari, Ergash Jumanbulbul o'g'lidan yozib olingan "Kuntug'mish"dostoni baxshi asarlarining "Bulbul taronalari" nomli besh jildligiga[3], "O'zbek xalq ijodi" ko'p jildligining "Orzigul"nomi bilan nashr etilgan jildiga ham kiritilgan. 2011- yilda bu doston Ergash Jumanbulbuldan yozib olingan "Ravshan" dostoni bilan birgalikda chop ettirildi[4].

Ergash Jumanbulbul o'g'li ijro etgan "Kuntug'mish"dostonining1949-yilda nashrga tayyorlanib chop ettirilgan matni shoira S.Somova tarafidan rus tiliga tarjima qilinib, uning parchalari "Антология узбкской поэзии"va "Народная поэзия Узбекистана" to'plamlarida bosib chiqarildi. Mazkur dostonning rus tilidagi to'liq matni esa "Узбекские народные поэмы", "Лукавая царевна", "Песни Булбуля" majmualarida chop ettirildi. Shuningdek, Ergash Jumanbulbul o'g'lining og'zidan 1926-yil fidoiy folklor to'plovchi Muhammad Isa Ernazar o'g'li yozib olgan hozirda O'zbek tili va adabiyoti ilmiy tadqiqot instituti Folklor arxivida 11-inventar raqami ostida saqlanayotgan asl nusxasi asosida 2016-yilda folklorshunos Mamatqul Jo'rayev, Hodi Zarifov ,Zubayda Husanovalar tomonidan nashrga tayyorlanib " O'zbek xalq ijodi yodgorliklari" 100 jildligining 9 jildida nashr etildi3

Dostonning boshqa variantlaridan "Kuntug'mish polvon" dostoni 1927-yil 10-sentabrda Samrqand viloyatining Kattaqo'rg'on tumanida yashovchi Nurmon Adivoy o'g'lidan folklor to'plovchi zarif Qodriy yozib olgan. Mazkur doston jami 36 sahifadan iborat. U35x21 o'lchamdagi sarg'ish-oq qog'ozga arab alifbosiga asoslangan eski o'zbek yozuvida yozilgan. Qo'lyozmaning ilk sahifasida "el dostonlaridan "Kuntug'mishbek-Xolbeka" dostoni. Aytuvchi: xalq shoirlaridan Nurmon Abdivoy o'g'li. Yozuvchi: Zarif Qodiriy. Kattaqo'rg'on,1927-yil 10-sentabr" degan yozuv bitilgan[2]

[1]Bulbul taronalari.1-jild. Nashrga tayyorlovchi: Hodi Zarifov.- Toshkent, 1971. 178-345-betlar
[2]Kuntug'mish. Ravshan (dostonlar). – Toshkent: ''Sharq'' nashriyot- matba aksiyadorlik kompaniyasi bosh tahririyati, 2011.

“Kuntug‘mish” dostoni variantlarining o‘rganilish darajasi ham dastlabki bosqichlarda turibdi. Bir qator ishlarda dostonning ma’lum variantlari mavjudligi aytilgan bo‘lsada, ular haqida to‘liq ma’lumotlar keltirib o‘tilmagan. Bu o‘rinda, avvalo, folklorshunoslikning u yoki bu nazariy masalalari xususida to‘xtalinganda misol tariqasida “Kuntug‘mish” dostoniga murojaat qilingan o‘rinlar mavjudligini aytish lozim. Jumladan, M. Saidov “Xolbeka ” nashriga yozgan so‘zboshisida: - “Kuntug‘mish” nomi bilan atalgan dostonlar matnini qiyosiy o‘rganilganda, bular o‘rtasida syujetda aytarli o‘zgarishlar, tofovutlar yo‘qligi darhol ko‘zga tashlanadi. Faqat xalq og‘zaki badiiy ijodi, xususan, dostonchilik doirasidagi variantlik tushunchasi saqlanib qolgan”,-deb yozadi. H. Zarifov, T. Mirzayev maqolalarida ham “Kuntug‘mish” dostoniga nisbatan saosan “variant” atamasi qo‘llanib, “versiya” atamasi tilga olinmagn. Buning sababini T. Mirzayevning doston tarixi bilan bog‘liq tadqiqoti xulosalaridan biri- uning tarqalish hududi haqidagi fikri aniq izohlashini ham qayd etishi lozim.

O‘zbek folklorshunosligida har bir xalq og‘zaki ijodi na’munasini yozib olish, to‘plash, saqlash hamda ularni saralab nashr etishda, asosan, eng mukammal va badiiy jihatdan yuksak namunaga tayanib ish yuritilganligini “Kuntug‘mish” dostonining Ergash Jumanbulbul o‘g‘li variantiga munosabatda aniq ko‘ramiz. Ayni paytda, keng qamrovli tadqiqotlar uchun har bir dostonning barcha variantlarini qiyosiy o‘rganish ushbu doston tarixi, ma’lum motivlar, syujet yo‘nalishlari va boshqa jihatlarini atroflicha tadqiq etishda muhim ahamiyatga ega.

Foydalanilgan adabiyotlar

1. Ergash Jumanbulbul o‘g‘li. Kuntug‘mish(doston)/O‘zbek xalq ijodi yodgorliklari(nashrga tayyorlovchilar: Hodi Zarifov,Zubayda Husanova,Mamatqul Jo‘rayev). –Toshkent,2016. 497-bet
2. O‘zbek folklori. Hodi Zarifov. – Toshkent, 1939. 207-218 betlar.
3. Ergash Jumanbulbul o‘g‘li. Kuntug‘mish(doston). Nashrga tayyorlovchi: Buyuk Karimiy.- Toshkent, 1949.

4. Orzigul/dostonlar. O‘zbek xalq ijodi.- Toshkent:G‘ofir G‘ulom nomidagi Adabiyot va san’at nashriyoti,1975.131-265-betlar
5. Kuntug‘mish. Ravshan (dostonlar). – Toshkent: ‘‘Sharq’’ nashriyot- matba aksiyadorlik kompaniyasi bosh tahririyati, 2011.
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7. 1Zarifov T. Kuntug‘mish dostoni haqida//Ergash shoihr va uning dostonchilikdagi o‘rni. Tadqiqotlar. 2-kitob. Toshkent, 1971. 43-50-betlar.
8 .Mirzayev T. xalq baxshilarinig epik reprtuari. Toshken, 197931. 118-129-betlar.
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TRANSFORMATIV TA’LIMDA BO‘LAJAK O‘QITUVCHINING KASBIY-SHAXSIY RIVOJLANISHI

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Annotatsiya. Ushbu tezisda transformativ ta’limning bo‘lajak o‘qituvchilar kasbiy-shaxsiy rivojlanishiga ta’siri ilmiy-pedagogik jihatdan tahlil qilingan. Kasbiy-shaxsiy rivojlanish talabaning bilim va ko‘nikmalarini kengaytirish bilangina cheklanmay, uning pedagogik qarashlari, kasbiy qadriyatlari, faoliyat motivlari va o‘zini o‘qituvchi sifatida anglashidagi sifat o‘zgarishlarini ham qamrab olishi asoslangan. Transformativ ta’lim jarayonida muammoli tajriba, tanqidiy refleksiya, dialogik hamkorlik, bilimlarni qayta konstruksiyalash, faoliyatda sinab ko‘rish va kasbiy transferning o‘zaro bog‘liqligi ochib berilgan. Bo‘lajak o‘qituvchining kasbiy-shaxsiy rivojlanishini ta’minlaydigan motivatsion-aksiologik, refleksiv-dialogik va faoliyatli-transformativ mexanizmlar tavsiflangan. Mazkur mexanizmlar talabaning pedagogik voqelikka ongli munosabatini, mustaqil qaror qabul qilishini va o‘z kasbiy rivojlanishini boshqarish qobiliyatini shakllantirishga xizmat qilishi ko‘rsatilgan.

Kalit so‘zlar: transformativ ta’lim, bo‘lajak o‘qituvchi, kasbiy-shaxsiy rivojlanish, tanqidiy refleksiya, kasbiy pozitsiya, dialogik hamkorlik, pedagogik tajriba, kasbiy transfer.

ПРОФЕССИОНАЛЬНО-ЛИЧНОСТНОЕ РАЗВИТИЕ БУДУЩЕГО УЧИТЕЛЯ В УСЛОВИЯХ ТРАНСФОРМАТИВНОГО ОБУЧЕНИЯ

Аннотация. В данном тезисе с научно-педагогической точки зрения проанализировано влияние трансформативного обучения на профессионально-личностное развитие будущих учителей. Обосновано, что профессионально-личностное развитие не ограничивается расширением знаний и умений студента, а охватывает также качественные изменения в его педагогических взглядах, профессиональных ценностях, мотивах деятельности и осознании себя как

учителя. Раскрыта взаимосвязь проблемного опыта, критической рефлексии, диалогического взаимодействия, реконструирования знаний, их апробации в деятельности и профессионального переноса в процессе трансформативного обучения. Охарактеризованы мотивационно-аксиологический, рефлексивно-диалогический и деятельностно-трансформативный механизмы, обеспечивающие профессионально-личностное развитие будущего учителя. Показано, что данные механизмы способствуют формированию осознанного отношения студента к педагогической действительности, способности самостоятельно принимать решения и управлять собственным профессиональным развитием.

Ключевые слова: трансформативное обучение, будущий учитель, профессионально-личностное развитие, критическая рефлексия, профессиональная позиция, диалогическое взаимодействие, педагогический опыт, профессиональный перенос.

PROFESSIONAL AND PERSONAL DEVELOPMENT OF A PROSPECTIVE TEACHER IN TRANSFORMATIVE LEARNING

Abstract. This thesis analyzes the impact of transformative learning on the professional and personal development of prospective teachers from a scientific and pedagogical perspective. It is substantiated that professional and personal development is not limited to expanding students' knowledge and skills but also encompasses qualitative changes in their pedagogical views, professional values, motivation, and self-perception as teachers. The interrelationship among challenging experiences, critical reflection, dialogic interaction, knowledge reconstruction, practical application, and professional transfer within the transformative learning process is revealed. The motivational-axiological, reflective-dialogic, and activity-transformative mechanisms that facilitate prospective teachers' professional and personal development are characterized. These mechanisms are shown to contribute to the formation of students'

conscious attitudes toward pedagogical reality and their ability to make independent decisions and manage their own professional development.

Keywords: transformative learning, prospective teacher, professional and personal development, critical reflection, professional position, dialogic interaction, pedagogical experience, professional transfer.

Zamonaviy pedagogik ta’lim oldida nafaqat muayyan bilim va metodlarni egallagan, balki o‘z faoliyatini tanqidiy tahlil qila oladigan, o‘zgaruvchan ta’lim sharoitlariga moslashadigan hamda kasbiy qarorlarining pedagogik va ijtimoiy oqibatlarini anglaydigan o‘qituvchini tayyorlash vazifasi turibdi. Mazkur vazifa bo‘lajak o‘qituvchilarni tayyorlash jarayonini tayyor bilimlarni o‘zlashtirishdan kasbiy tajribani anglash, qayta baholash va takomillashtirishga yo‘naltirishni talab etadi. Shu jihatdan transformativ ta’lim bo‘lajak o‘qituvchining kasbiy-shaxsiy rivojlanishini ta’minlashning istiqbolli pedagogik asosi sifatida namoyon bo‘ladi.

Transformativ ta’lim nazariyasida ta’lim insonning mavjud tasavvurlari, taxminlari va tajribani talqin qilish usullarini tanqidiy qayta ko‘rib chiqish jarayoni sifatida tushuntiriladi. J. Mezirov transformativ o‘rganishni shaxsning muammoli qarashlar tizimini tanqidiy refleksiya va muloqot orqali qayta shakllantirishi bilan bog‘laydi [1; 2]. Bunda o‘zgarish faqat bilim hajmining ortishi bilan emas, balki insonning o‘ziga, faoliyatiga va atrofdagi voqelikka munosabatidagi yangilanish bilan belgilanadi. Shuning uchun transformativ ta’lim natijasini oddiy o‘zlashtirish ko‘rsatkichlaridan kengroq mazmunda baholash zarur.

Bo‘lajak o‘qituvchining kasbiy-shaxsiy rivojlanishi — bu talabaning pedagogik bilimlari, faoliyat usullari, kasbiy qadriyatlari, refleksiv qobiliyati va o‘qituvchilik pozitsiyasida yuz beradigan o‘zaro bog‘liq sifat o‘zgarishlari jarayonidir. Mazkur rivojlanish jarayonida talaba pedagogik faoliyatning tayyor me’yorlarini o‘zlashtiruvchi obyekt bo‘lib qolmay, o‘z tajribasini anglaydigan, qarashlarini qayta baholaydigan hamda rivojlanish yo‘nalishini belgilaydigan faol subyektga aylanadi.

Kasbiy va shaxsiy rivojlanishning o‘zaro birligi o‘qituvchi faoliyatining o‘ziga xos xususiyatidan kelib chiqadi. Pedagogning kasbiy qarori uning bilimlari bilan bir qatorda qadriyatlari, e’tiqodi, mas’uliyati, ta’lim oluvchiga munosabati va o‘z faoliyatini baholash qobiliyatiga ham bog‘liq. Shu sababli bo‘lajak o‘qituvchini tayyorlashda faqat metodik harakatlar algoritmini o‘rgatish yetarli emas. Talaba nima uchun aynan shu pedagogik qarorni tanlayotgani, uning qarori ta’lim oluvchining rivojlanishiga qanday ta’sir ko‘rsatishi va muqobil yondashuvlardan qaysi jihatlari bilan farqlanishini ham anglashi lozim.

Transformativ ta’limdagi kasbiy-shaxsiy rivojlanishning boshlang‘ich nuqtasi talabaning mavjud qarashlari bilan yangi pedagogik vaziyat talablari o‘rtasidagi nomuvofiqlikdir. Murakkab yoki ziddiyatli pedagogik vaziyat talabaning ilgari shakllangan tasavvurlarini savol ostiga qo‘yadi. Masalan, barcha talabalarga bir xil topshiriq berishni adolatli yondashuv deb hisoblagan bo‘lajak o‘qituvchi turli ta’lim ehtiyojlariga ega o‘quvchilar ishtirokidagi vaziyatni tahlil qilish jarayonida o‘z qarashlarini qayta baholash zaruriyatiga duch keladi. Mazkur holat transformativ o‘zgarishga olib kelishi uchun muammoli vaziyatning o‘zi yetarli emas. U tanqidiy refleksiya, dalillarga asoslangan muloqot va muqobil yechimlarni amalda tekshirish bilan to‘ldirilishi kerak.

Bo‘lajak o‘qituvchining kasbiy-shaxsiy rivojlanishini ta’minlash mexanizmlarini uchta o‘zaro bog‘liq guruhga ajratish mumkin.

Birinchisi – **motivatsion-aksiologik mexanizm**. U talabaning pedagogik faoliyat mazmunini shaxsiy va ijtimoiy qadriyat sifatida anglashiga xizmat qiladi. Bunda kasbiy muammolarni shaxsiy mazmunga ega vaziyatlar bilan bog‘lash, pedagogik qarorlarning axloqiy jihatlarini muhokama qilish, o‘qituvchining mas’uliyati va kasbiy tanlovini tahlil etish muhimdir. Mazkur mexanizm talabaning o‘zgarishga bo‘lgan ichki ehtiyojini yuzaga keltiradi. Ichki motivatsiya mavjud bo‘lmasa, refleksiya ko‘pincha topshiriqni rasmiy bajarish darajasida qolib ketadi.

Ikkinchisi – **refleksiv-dialogik mexanizm**. Refleksiya talabaning o‘z qarashlari, qarorlari va faoliyat natijalarini tahlil qilishi, ularning asoslarini aniqlashi hamda zarur hollarda qayta ko‘rib chiqishini anglatadi. D. Shyon refleksiv amaliyotni mutaxassisning noaniq vaziyatlarda o‘z faoliyatini anglash va takomillashtirish vositasi sifatida izohlaydi [3]. Pedagogik tayyorgarlikda refleksiya kundalik yuritish, pedagogik vaziyatlarni tahlil qilish, o‘zini o‘zi baholash, tengdoshlar fikrini o‘rganish va refleksiv suhbatlar vositasida tashkil etilishi mumkin.

Refleksiya dialog bilan uyg‘unlashgandagina talaba o‘z qarashlarini boshqa nuqtayi nazarlar bilan taqqoslash imkoniga ega bo‘ladi. Dialogik hamkorlik jarayonida fikrni dalillar bilan asoslash, qarama-qarshi yondashuvlarni xolis baholash va umumiy xulosaga kelish ko‘nikmalari rivojlanadi. Bunday muloqot o‘qituvchining tayyor xulosani yetkazishi emas, balki talabaning mustaqil fikrlashi uchun sharoit yaratishi bilan tavsiflanadi. O‘qituvchi bu jarayonda axborotning yagona manbai emas, balki refleksiya va hamkorlikni tashkil etuvchi fasilitator vazifasini bajaradi.

Uchinchisi – **faoliyatli-transformativ mexanizm**. Kasbiy qarashlardagi o‘zgarish amaliy faoliyatda sinab ko‘rilmasa, u barqaror kasbiy pozitsiyaga aylanmasligi mumkin. Shu bois talabalar muammoli pedagogik vaziyatlarni hal qilish, dars loyihalarini ishlab chiqish, mikrodars o‘tkazish, rolli modellashtirish, pedagogik amaliyot natijalarini tahlil qilish kabi faoliyatlarga jalb etilishi zarur. Talaba yangi yondashuvni amalda qo‘llaydi, natijalarni kuzatadi, teskari aloqa oladi va o‘z harakatlariga tuzatish kiritadi. Natijada nazariy xulosa shaxsiy tajribaga, tajriba esa kasbiy faoliyat usuliga aylanadi.

Ushbu mexanizmlarning ishlashi transformativ ta’lim jarayonining quyidagi mantiqiy izchilligini yuzaga keltiradi:

muammoli pedagogik tajriba → tanqidiy refleksiya → dialogik tahlil → mavjud qarashlarni qayta konstruksiyalash → yangi yechimni modellashtirish → amaliy sinov → kasbiy transfer → refleksiv baholash.

Mazkur ketma-ketlik chiziqli algoritm sifatida emas, balki qayta takrorlanadigan rivojlanish sikli sifatida qaralishi kerak. Chunki amaliy sinov natijalari yangi savollarni yuzaga keltirishi, talabaning qarashlarini yana qayta ko‘rib chiqishiga sabab bo‘lishi mumkin. Shunday qilib, transformativ ta’lim bir martalik o‘zgarishni emas, uzluksiz kasbiy rivojlanishga tayyorlikni shakllantiradi.

Bo‘lajak o‘qituvchining kasbiy-shaxsiy rivojlanishini ta’minlash uchun ta’lim jarayonida bir qator pedagogik shart-sharoitlar yaratilishi lozim. Avvalo, talaba o‘z fikrini erkin ifodalashi, xato qilishdan qo‘rqmasligi va muqobil qarashlarni muhokama qilishi mumkin bo‘lgan psixologik xavfsiz muhit zarur. Ikkinchidan, o‘quv mazmuni real pedagogik muammolar bilan bog‘lanishi va bir nechta asoslangan yechimga ega ochiq topshiriqlarni qamrab olishi kerak. Uchinchidan, individual hamda guruhiy refleksiya mashg‘ulotning yakuniy qismi emas, balki butun ta’lim jarayonining muntazam komponenti sifatida tashkil etilishi lozim.

To‘rtinchidan, o‘qituvchi va talaba o‘rtasidagi munosabat hamkorlik, o‘zaro hurmat va dalillarga asoslangan muloqot tamoyillariga qurilishi zarur. Beshinchidan, talabaning mustaqil tanlov qilishi, qarorini asoslab berishi va uning natijasi uchun mas’uliyatni his etishiga imkon berilishi kerak. Oltinchidan, baholash faqat yakuniy natijani qayd etmasdan, talabaning dastlabki va keyingi qarashlari o‘rtasidagi o‘zgarishni ham aniqlashi lozim. Bunda refleksiv esse, portfolio, pedagogik keys, kuzatuv varaqasi va o‘zini o‘zi baholash vositalaridan foydalanish mumkin.

Transformativ ta’lim natijalarini baholashda to‘rtta ko‘rsatkichni hisobga olish maqsadga muvofiq: birinchisi – talabaning o‘z pedagogik qarashlari va ularning shakllanish sabablarini anglay olishi; ikkinchisi – mavjud qarashlarni dalillar asosida tanqidiy qayta baholashi; uchinchisi – yangi kasbiy pozitsiyani pedagogik faoliyatda namoyon qilishi; to‘rtinchisi – egallangan yondashuvni yangi vaziyatlarga mustaqil ko‘chira olishi. Ushbu ko‘rsatkichlar kasbiy-shaxsiy rivojlanishni faqat bilim darajasi bilan emas, balki talabaning fikrlashi, qadriyatlari va faoliyatidagi o‘zgarishlar orqali baholash imkonini beradi.

Transformativ ta’limni tashkil etishda ayrim cheklovlarni ham e’tiborga olish zarur. Har qanday muammoli topshiriq transformativ natijaga olib kelmaydi. Talabani o‘z qarashlarini o‘zgartirishga majburlash ham transformativ ta’lim mohiyatiga zid hisoblanadi. Transformatsiya pedagog tomonidan oldindan belgilangan fikrni qabul qildirish emas, balki talabaning dalillar, refleksiya, muloqot va tajriba orqali asoslangan xulosaga mustaqil kelishidir. Shuningdek, talabalarning shaxsiy tajribasi, o‘zgarishga tayyorligi va refleksiv qobiliyatidagi farqlar sababli rivojlanish sur’ati bir xil bo‘lmasligi mumkin.

Xulosa qilib aytganda, transformativ ta’lim bo‘lajak o‘qituvchining kasbiy-shaxsiy rivojlanishini bilimlarni oddiy o‘zlashtirishdan pedagogik qarashlar va faoliyat usullarini ongli ravishda qayta qurish darajasiga olib chiqadi. Mazkur jarayon motivatsion-aksiologik, refleksiv-dialogik va faoliyatli-transformativ mexanizmlarning o‘zaro uyg‘unligi orqali amalga oshadi. Muammoli pedagogik tajriba, tanqidiy refleksiya, ochiq muloqot, amaliy sinov va kasbiy transfer asosida talaba o‘z rivojlanishining faol subyektiga aylanadi. Natijada unda o‘z faoliyatini muntazam tahlil qilish, pedagogik qarorlarini asoslash, yangi sharoitlarga moslashish va uzluksiz kasbiy rivojlanishga tayyorlik shakllanadi.

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Janton P. *Understanding and Promoting Transformative Learning: A Guide to*

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G

O‘zbek tilidagi gaplarni parafraz qilish turlari

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Annotatsiya.Ushbu tezisda o‘zbek tilidagi gaplarni parafraz qilish usullari, ularning ahamiyati va qo‘llanilishi yoritilgan. Shuningdek, gaplarni mazmunini saqlagan holda qayta ifodalash, nutqiy ko‘nikmalarni rivojlantirish hamda plagiatning oldini olish masalalari bayon etilgan.

Kalit so‘zlar: parafraz, sinonim, plagiat, frazema.

Abstract. This thesis discusses the methods of paraphrasing sentences in Uzbek, their importance, and their application. It also addresses the reformulation of sentences while preserving their original meaning, the development of language skills, and the prevention of plagiarism.

Keywords: paraphrasing, synonym, plagiarism, phraseological.

Аннотация: тезисе рассматриваются способы перефразирования предложений в узбекском языке, их значение и применение. Также освещаются вопросы переформулирования предложений с сохранением их исходного смысла, развития речевых навыков и предотвращения плагиата.

Ключевые слова: парафраз, синоним, плагиат, фразеологическая единица.

PERIFRAZ yoki PERIFRAZA – (gr. reriphrasis – yaqin gapiraman so‘zidan) ko‘chim turlaridan biri bo‘lib, unda narsa yoki inson o‘z nomi bilan emas, balki unga xos asosiy belgilar, xususiyatlar nomi bilan yuritiladi. Perifraza ko‘pincha she’riy nutqqa tasviriylik va ta’sirchanlik bag‘ishlaydi [1].

Umuman, dunyo tilshunosligida perifrazalar talqiniga bag‘ishlangan juda ko‘plab monografik tadqiqotlar olib borilgan, barcha izlanishlarda bu atama “perefras”, “perifrazis”, “perifrasis”, “perifraza” “parafraz”, “parafraza”, “parafrazis” kabi fonetik hodisalarning variantlashuvi asosida izohlanganligiga guvoh bo‘ldik. “Parafraza” va

“perifraza” atamalarida “para” ham, “peri” ham yunonchadan olingan bo‘lib, “para” – yonida, atrofida, yonma-yon ma’nolarida, “peri” – haqida, to‘g‘risida, xususida ma’nolarida qo‘llaniladperifraza terminini qo‘llashni mantiqan to‘g‘ri deb hisoblaymiz [2]. H.Shamsiddinov ham “perifraza” atamasini qo‘llashni ma’qullaydi [3].

Parafraz qilish - bu biror matnni o‘zgartirish yoki boshqalarning g‘oyalarini o‘z so‘zlaringiz bilan ifodalashdir. Bu jarayon matnning ma’nosini saqlagan holda, so‘zlar va gaplar shaklini o‘zgartirishni o‘z ichiga oladi. Matnni perifraz qilish orqali biz manbaning mazmunini yanada tushunarli va aniqroq ifodalashga erishamiz.

Perifraz qilishning ahamiyati turli yozuvlarda, ayniqsa, akademik va ijodiy yozuvda katta rol o‘ynaydi. Bu nafaqat boshqa manbalar bilan ishlashni talab qiladi, balki yozuvchiga o‘z ovozini saqlab qolgan holda mazmunni yaratishga imkon beradi. Quyida perifrazning muhimligini ko‘rsatuvchi asosiy sabablar keltirilgan:

1. *Plagiatdan qochish uchun* - matnni perifraz qilish orqali siz boshqa manbalardan foydalanasiz, lekin ayni vaqtda o‘z so‘zlaringiz bilan ifodalaysiz. Bu esa o‘zingizni plagiatdan himoya qilishning eng samarali usullaridan biridir. Perifraz asl matn fikrlarni ko‘rsatishga imkon beradi, shu bilan birga manbaga hurmat saqlanadi.

2.*Mazmunni aniqroq yetkazish* - ba’zan asl matn murakkab yoki biz uchun tushunarsiz bo‘lishi mumkin. Perifraz qilish matnni soddalashtirish va bizga osonroq tushunadigan shaklda taqdim etishga yordam beradi.

3. *Asosiy fikrlarni qisqartirish* - perifraz qilish orqali matnning muhim qismlarini ajratib, ularni qisqacha bayon qilishingiz mumkin. Bu, ayniqsa, katta hajmdagi ma’lumotlarni qisqa va tushunarli shaklda taqdim etishda foydalidir.

4. *Til ko‘nikmalarini rivojlantirish* - perifraz qilish lug‘at boyligini oshiradi va yozma nutq ko‘nikmalarini rivojlantiradi. Bu jarayon davomida yangi so‘zlarni o‘rganasiz va gaplarni turli usullarda shakllantirishni mashq qilasiz.

5. *O‘rganuvchilar bilan bog‘lanish* - boshqalarga mos tilda va uslubda yozish uchun perifraz qilish muhim. Masalan, murakkab ilmiy ma’lumotlarni oddiy va aniq

so‘zlar bilan qayta ifodalash orqali turli auditoriyalar uchun tushunarli bo‘lishni ta’minlaydi [4].

Quyida samarali parafraz qilish uchun asosiy usullar keltirilgan:

Usul	Izoh	Asl matn	Parafraz qilingan shakli
Sinonimlar,tasviriy ifodalar, frazeologizmlardan foydalanish	Bir so‘z yoki iborani o‘xshash ma’noli boshqa so‘z bilan almashtirish.	Neft mamlakat iqtisodiyotid muhim o‘rin tutadi.	Qora oltin mamlakat iqtisodiyotida muhim o‘rin tutadi.
So‘z shaklini o‘zgartirish	So‘zlarning turkumini yoki grammatik shaklini o‘zgartirish. Masalan, otni fe’lga, fe’lni sifatga almashtirish.	Loyihani o‘z vaqtida yakunlash rahbariyatning asosiy talabi edi.	Loyihani o‘z vaqtida tugatishni rahbariyat qat’iy talab qildi.
Faol va passiv gaplar o‘rtasida almashish (aniq nisbatdagi gaplarni majhul nisbatdagi gapga aylantirish, ingliz tilida)	Faol gapni passiv gapga yoki aksincha o‘zgartirish orqali matnga yangilik qo‘shish.	Arxitektorlar shahar markazida yangi bog‘ barpo etishdi.	Shahar markazida arxitektorlar tomonidan yangi bog‘ barpo etildi.
So‘z tartibini o‘zgartirish	Jumlalar ichidagi so‘zlarning joylashuvini o‘zgartirish orqali yangi tuzilma yaratish	Kompaniya xodimlari har yili xorijda malaka oshiradilar.	Har yili xorijda kompaniya xodimlari malaka oshiradilar.
Jumlalarni qisqartirish yoki kengaytirish	Jumla uzunligini	O‘quvchilar maktab	Qisqartirilgan parafraz: O‘quvchilar

	o‘zgartirish orqali matnni yangicha ifodalash.	kutubxonasiga borib, o‘zlariga kerakli kitoblarni tanlanadilar va ularni uyda o‘qish uchun olib ketdilar.	kutubxonadan kitob oldilar. Kengaytirilgan parafraz: O‘quvchilar darslardan so‘ng maktab kutubxonasiga tashrif buyurib, o‘zlarining qiziqishlariga mos kitoblarni tanladilar va ularni bo‘sh vaqtlarida o‘qish uchun uylariga olib ketdilar.
O‘z so‘zlaringiz ifodalash	Matnni o‘zingizning so‘zlaringiz bilan yozib, asl matn mazmunni saqlash	Kitob o‘qish insonning fikrlash qobilyatini rivojlantiradi va so‘z boyligini oshiradi.	Mutolaa qilish odamning mustaqil fikrlarini yaxshilaydi hamda foydali ma’lumotlar o‘rganishiga yordam beradi.
Specific gapdan general gapga yoki aksincha o‘tish	Maxsus ma’lumotlarni umumlashtirish yoki umumiy ma’lumotni aniqlashtirish.	Talabalar kuniga ikki soat davomida kutubxonada dars tayyorlaydi.	Umumiylashtirish: Talabalar bilim olish uchun muntazam vaqt ajratadi. Aniqlashtirish:Talabalar kutubxonada har kuni ikki soat davomida kitob o‘qiydi va darslarini tayyorlaydi.
Hissiyotni o‘zgartirish yoki neytrallashtirish	Matnning hissiyot darajasini o‘zgartirish yoki uni neytral shaklda ifodalash	Bu film nihoyatda zo‘r va juda hayajonli!	Neytral shakl: Bu film yaxshi va qiziqarli

Matnni parafraz qilganimizda iloji boricha plagiatdan qochishimiz kerak. Parafraz qilish boshqalarning fikrlarini o‘z so‘zlaringiz bilan ifodalashni anglatadi, ammo bu o‘zingizning g‘oyangiz emas, balki boshqa manbaga asoslanganligini ko‘rsatish uchun manba keltirish zarur. Nima uchun parafraz qilishda manba keltirish kerak?

Manba egasiga hurmat ko‘rsatish uchun: Parafraz orqali sizning yozganingiz aslida boshqa bir muallifning fikri ekanligini tan olasiz.

Plagiatdan qochish uchun: Manba ko‘rsatilmagan parafraz plagiat hisoblanishi mumkin.

To‘g‘ri manbaga yo‘naltirish uchun: O‘rganuvchilar siz taqdim etgan fikrni chuqurroq o‘rganishni xohlasa, manba orqali to‘g‘ri ma’lumotga ega bo‘ladi.

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INGLIZ TILINI O‘QITISHDA BOSHLANG‘ICH SINF O‘QUVCHILARINING KREATIV KOMPETENSIYASINI SHAKLLANTIRISH VA 4+1 TIL KO‘NIKMALARINI INTEGRATSIYALASHGAN HOLDA RIVOJLANTIRISHNING ZAMONAVIY METODLARI

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Annotatsiya

Ushbu tezisda boshlang‘ich sinf o‘quvchilarining ingliz tilini o‘rganishga bo‘lgan qiziqishini oshirish, kreativ kompetensiyasini shakllantirish hamda 4+1 til ko‘nikmalarini (Listening, Speaking, Reading, Writing va Grammar) integratsiyalashgan holda rivojlantirish zarurati ilgari suriladi. Boshlang‘ich sinflarda olib borgan pedagogik tajribamizga asoslanib, ijodiy topshiriqlar, loyiha ishlari, rolli o‘yinlar va kundalik hayotga asoslangan faoliyatlardan foydalanishning ahamiyati ta’kidlanadi. Tezisning asosiy g‘oyasi — ingliz tilini o‘qitishda zamonaviy, kreativ va amaliy yondashuvlarni qo‘llash orqali o‘quvchilarning til ko‘nikmalarini o‘zaro uyg‘un rivojlantirish hamda boshlang‘ich ta’lim bosqichidayoq samarali natijalarga erishish imkoniyatlarini asoslashdan iborat.

Kalit so‘zlar: kreativ kompetensiya, boshlang‘ich ta’lim, 4+1 yondashuvi, Speaking, kommunikativ ko‘nikmalar, ijodiy topshiriqlar, zamonaviy metodlar.

Kirish

Bugungi kunda ingliz tilini o‘qitishda faqat grammatik qoidalar va yangi so‘zlarni o‘rgatish bilan cheklanib qolmasdan, o‘quvchilarning olgan bilimlarini amaliyotda qo‘llay olishiga ham alohida e’tibor qaratish lozim. Ayniqsa, boshlang‘ich sinflarda o‘quvchilarning ingliz tilida mustaqil fikrlashi, erkin muloqot qilishi va ijodiy yondashuvini rivojlantirish muhim ahamiyatga ega. Buning uchun dars jarayonida zamonaviy metodlar, kreativ topshiriqlar va hayotiy vaziyatlarga asoslangan mashg‘ulotlardan foydalanish zarur.

An’anaviy ta’limda ko‘proq tarjima qilish, so‘z yodlash, grammatik mashqlar va yozma topshiriqlarga e’tibor berilgan bo‘lsa, bugungi ta’lim jarayoni o‘quvchilarning kommunikativ kompetensiyasi va ijodiy fikrlashini rivojlantirishni ham talab etadi. Zamonaviy texnologiyalar va sun’iy intellekt rivojlanayotgan davrda o‘quvchilarning

mustaqil qaror qabul qilishi, muammolarga ijodiy yondashishi va o‘z fikrini ifodalashi yanada muhimdir.

Shu sababli boshlang‘ich sinflarda ingliz tilini o‘qitishda to‘rtta asosiy til ko‘nikmasi — Listening, Speaking, Reading va Writingni grammatik bilimlar bilan uyg‘unlashtirish, ya’ni 4+1 yondashuvini qo‘llash hamda kreativ kompetensiyani shakllantirish dolzarb masalalardan biridir. Ushbu tezisda mazkur g‘oyaning ahamiyati va boshlang‘ich sinflarda samarali natijalarga erishishdagi o‘rni ilgari suriladi.

Adabiyotlar tahlili

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Xorijiy olimlardan Jeremy Harmerning The Practice of English Language Teaching (2015), Jack C. Richards va Theodore S. Rodgersning Approaches and Methods in Language Teaching (2014), Scott Thornburyning How to Teach Speaking (2005) asarlari til o‘qitish metodlari va kommunikativ ko‘nikmalarni rivojlantirishga bag‘ishlangan. Shuningdek, Kids’ English 1–4, Family and Friends 1–4 va Solutions o‘quv majmualari til ko‘nikmalarini amaliy mashqlar orqali rivojlantirishga xizmat qiladi.

Metodoologiya

Tadqiqotning metodologik asosini kommunikativ yondashuv, kreativ ta’lim tamoyillari va til ko‘nikmalarini integratsiyalash nazariyasi tashkil etadi. Tadqiqot jarayonida ilmiy adabiyotlarni tahlil qilish, taqqoslash, umumlashtirish va pedagogik kuzatish metodlaridan foydalanildi. Boshlang‘ich sinf o‘quvchilarining yosh xususiyatlari, individual ehtiyojlari, mustaqil fikrlashi va amaliy muloqot ko‘nikmalarini rivojlantirishga qaratilgan metodik yondashuvlar o‘rganildi. Shuningdek, to‘rtta asosiy til ko‘nikmasi — tinglab tushunish, gapirish, o‘qish va yozishni grammatik bilimlar bilan uyg‘un rivojlantirishning nazariy asoslari tahlil qilindi. Ushbu yondashuvlar tezisdan kelib chiqib, boshlang‘ich sinflarda olib borgan pedagogik tajribamiz bilan bog‘liq holda maqolamizda batafsil yoritiladi.

Muhokama

Boshlang‘ich sinflarda ingliz tilini o‘qitishda o‘quvchilarning faqat yozma ko‘nikmalar, grammatika va lug‘at o‘zlashtirish bilan cheklanib qolmasligi muhimdir. Ayniqsa, 1–4-sinf o‘quvchilarida Speaking ko‘nikmasini rivojlantirish, o‘rgangan so‘z

va grammatik birliklarini kundalik muloqotda mustaqil qo‘llay olish malakasini shakllantirishga alohida e’tibor qaratish lozim. Shu maqsadda darslikni to‘g‘ri tanlash va uning imkoniyatlaridan samarali foydalanish muhim o‘rin tutadi.

Masalan, 4-sinf o‘quvchilari uchun Family and Friends 4, Solutions Beginner yoki bilim darajasiga qarab Solutions Elementary darsliklaridan foydalanish mumkin. Family and Friends majmuasi talaffuz, grammatika va lug‘atni rivojlantirishga yo‘naltirilgan bo‘lsa, Solutions darsligida Speaking mashg‘ulotlari va boshqa til ko‘nikmalarini amaliyotda qo‘llashga qaratilgan topshiriqlar ham mavjud. Masalan, Family mavzusini o‘rganishda o‘quvchilar yangi so‘zlarni o‘zlashtirish bilan birga tinglab tushunish, o‘qish, yozish, grammatik mashqlar va og‘zaki muloqot faoliyatlarida qatnashadi. Bu esa til ko‘nikmalarini integratsiyalashgan holda rivojlantirish imkonini beradi.

Xorijiy tillarni o‘qitish metodikasi rivojlanishi bilan ta’limda grammatik qoidalar va tarjimaga asoslangan mashqlardan tashqari, kommunikativ faoliyatlarga ham katta e’tibor qaratilmoqda. O‘zbekistonda ham xorijiy tillarni o‘rganishga bo‘lgan e’tiborning ortishi o‘quvchilarning tilni amaliy qo‘llash ko‘nikmalarini rivojlantirish zaruratini kuchaytirdi. Shu sababli uy vazifalarini faqat ish daftaridagi mashqlar, gap tuzish yoki tarjima qilish bilan cheklamasdan, ijodiy va hayotiy topshiriqlar bilan boyitish maqsadga muvofiqdir.

Boshlang‘ich sinflarda olib borgan pedagogik tajribamiz asosida ijodiy topshiriqlar va loyiha ishlarini ta’lim jarayoniga kiritish muhim deb hisoblaymiz. Bunday vazifalarda o‘quvchi tayyor namunani takrorlash bilangina cheklanmay, o‘z g‘oyasini ishlab chiqishi, uni ingliz tilida ifodalashi va mustaqil qaror qabul qilishi mumkin. Masalan, My Family, My Favourite Dish, My Daily Routine va In the Bazaar kabi mavzularga asoslangan topshiriqlar o‘quvchilarga lug‘at va grammatik bilimlarini amaliy vaziyatlarda qo‘llash imkonini beradi.

Bugungi kunda texnologiyalar va sun’iy intellektning jadal rivojlanishi sharoitida kreativ fikrlash, muammolarga mustaqil yechim topish va yangicha g‘oyalarni ilgari surish ko‘nikmalari yanada muhim ahamiyat kasb etmoqda. Shu bois ingliz tilini o‘qitishda o‘quvchilarning nafaqat til bilimlarini, balki ijodkorligi va mustaqil fikrlashini ham rivojlantirish zarur. Ta’lim jarayoni o‘quvchiga o‘z imkoniyatlarini namoyon etish va o‘rgangan tilini real vaziyatlarda qo‘llash uchun sharoit yaratishi lozim.

Xulosa qilib aytganda, boshlang‘ich sinflarda ingliz tilini o‘qitishda “gap tuzish va tarjima qilish” bilan cheklanib qolmasdan, kreativ va amaliy topshiriqlardan foydalanish muhimdir. Listening, Speaking, Reading va Writing ko‘nikmalarini Grammar bilan uyg‘unlashtirish o‘quvchilarning tilni yaxlit o‘zlashtirishiga,

kommunikativ va kreativ kompetensiyalarini rivojlantirishga xizmat qiladi. Shu sababli zamonaviy dars jarayonida o‘quvchining mustaqil fikrlashi va faol ishtirokiga asoslangan yondashuvlarni qo‘llash maqsadga muvofiqdir.

Xulosa

Xulosa qilib aytganda, boshlang‘ich sinflarda ingliz tilini o‘qitishda kreativ yondashuv va amaliy topshiriqlardan foydalanish o‘quvchilarning mustaqil fikrlashi, muloqot ko‘nikmalari va kreativ kompetensiyasini rivojlantirishga xizmat qiladi. Listening, Speaking, Reading, Writing va Grammar yo‘nalishlarini integratsiyalash hamda ijodiy uy vazifalarini tashkil etish orqali o‘quvchilarning ingliz tilida tezroq va erkinroq gapirishiga, qisqa muddatda samarali natijalarga erishishiga zamin yaratish mumkin. Ushbu yondashuvlarning samaradorligi kelgusi maqolamizda amaliy natijalar va dalillar asosida batafsil yoritiladi.

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МАКТАБГАЧА ТАЪЛИМ ТАШКИЛОТЛАРИДА ИЖТИМОИЙ ҲАМКОРЛИКНИ ТАШКИЛ ЭТИШ

Шарипова Гулрухсор Нуркабиловна
Мактабгача таълим ташкилотлари директор ва мутахассисларини қайта тайёрлаш ва уларнинг малакасини ошириш институти, Мактабгача таълим менежменти кафедраси доценти

Аннотация. Мақолада мактабгача таълим ташкилотларида (МТТ) ижтимоий ҳамкорликни ташкил этишнинг назарий асослари ва амалий механизмлари ёритилган. Ижтимоий ҳамкорлик субъектлари (оила, маҳалла, умумтаълим мактаби, соғлиқни сақлаш, маданият ва спорт муассасалари, нодавлат ташкилотлар ва ҳомийлар) ҳамда уларнинг функциялари аниқланган. Ж. Эпштейннинг ҳамкорлик турлари назарияси ва У. Бронфенбреннернинг экологик тизимлар модели асосида МТТ раҳбарининг ижтимоий ҳамкорликни бошқариш модели, унинг босқичлари ва самарадорлик мезонлари таклиф этилган.

Калит сўзлар: мактабгача таълим ташкилоти, ижтимоий ҳамкорлик, оила билан ҳамкорлик, маҳалла, бошқарув, раҳбар, шериклик, мониторинг.

Аннотация. В статье раскрыты теоретические основы и практические механизмы организации социального партнёрства в дошкольных образовательных организациях. Определены субъекты социального партнёрства и их функции; на основе теории типов вовлечённости Дж. Эпштейн и экологической модели У. Бронфенбреннера предложена модель управления социальным партнёрством руководителем дошкольной организации, её этапы и критерии эффективности.

Ключевые слова: дошкольная образовательная организация, социальное партнёрство, взаимодействие с семьёй, махалля, управление, руководитель, мониторинг.

Abstract. The article discusses the theoretical foundations and practical mechanisms of organizing social partnership in preschool educational organizations. The actors of social partnership and their functions are identified, and, drawing on J. Epstein’s framework of partnership types and U. Bronfenbrenner’s ecological model, a model for managing social partnership by the head of a preschool organization, its stages and effectiveness criteria are proposed.

Keywords: preschool educational organization, social partnership, family engagement, mahalla, management, leadership, monitoring.

КИРИШ

Бугунги кунда мактабгача таълим тизими Ўзбекистон Республикасида таълим ислоҳотларининг устувор йўналишларидан бирига айланди. «Мактабгача таълим ва тарбия тўғрисида»ги Қонунда мактабгача таълимнинг асосий вазифалари қаторида болаларни мактаб таълимига тайёрлаш, уларнинг жисмоний, ақлий ва маънавий ривожланишини таъминлаш, бу жараёнда ота-оналар ва жамоатчилик иштирокини кенгайтириш белгилаб қўйилган [1]. Ўзбекистон Республикаси мактабгача таълим тизимини 2030 йилгача ривожлантириш концепциясида ҳам соҳада давлат ва нодавлат секторлар ўртасидаги ҳамкорликни

ривожлантириш, ота-оналар ва жамоатчиликни таълим-тарбия жараёнига фаол жалб этиш муҳим вазифа сифатида қайд этилган [2].

Боланинг ривожланиши фақат мактабгача таълим ташкилоти деворлари ичида кечмайди: оила, маҳалла, соғлиқни сақлаш муассасалари, кутубхона ва маданият масканлари, келажакда бола борадиган мактаб — буларнинг барчаси ягона тарбиявий муҳитни ташкил этади. «Илк қадам» давлат ўқув дастури ҳам таълим-тарбия жараёнида оила билан ҳамкорликни мажбурий таркибий қисм сифатида назарда тутади [3]. Шу боис МТТ раҳбари олдида нафақат ички жараёнларни, балки ташқи ҳамкорлар билан муносабатларни ҳам тизимли бошқариш вазифаси туради.

Амалиётда эса ижтимоий ҳамкорлик кўпинча расмий тадбирлар, байрамлар ёки бир марталик ҳомийлик кўринишида чекланиб қолаётгани, ҳамкорлик режаси ва натижаларини баҳолаш мезонлари ишлаб чиқилмагани кузатилади. Мақоланинг мақсади — МТТларда ижтимоий ҳамкорликни ташкил этишнинг назарий асосларини таҳлил қилиш ва раҳбар фаолиятига йўналтирилган бошқарув моделини ишлаб чиқишдан иборат.

АДАБИЁТЛАР ТАҲЛИЛИ ВА МЕТОДОЛОГИЯ

Ижтимоий ҳамкорлик назариясининг методологик асосларидан бири У. Бронфенбреннернинг инсон ривожланиши экологияси назариясидир. Олим боланинг ривожланишини бир-бирига ичма-ич жойлашган тизимлар — микротизим (оила, боғча гуруҳи), мезотизим (микротизимлар ўртасидаги алоқалар), экзотизим ва макротизим таъсирида кечишини асослаб берган [4]. Бу ёндашувга кўра, оила ва МТТ ўртасидаги алоқалар сифати (мезотизим) боланинг ривожланишига бевосита таъсир қилади.

Ж. Эпштейн мактаб, оила ва жамоа ҳамкорлигининг олти турини ажратган: ота-оналикни қўллаб-қувватлаш, мулоқот, кўнгиллилик, уйда таълим олиш, қарор қабул қилишда иштирок ва жамоа билан ҳамкорлик [5]. Бу таснif кўплаб мамлакатларда таълим муассасаларининг ҳамкорлик дастурларини режалаштиришда асос сифатида қўлланилмоқда. А. Хендерсон ва К. Мапп томонидан умумлаштирилган тадқиқотлар натижалари оила ва жамоатчиликнинг таълимдаги иштироки болаларнинг таълимий натижалари ва ижтимоий мосланувига ижобий таъсир кўрсатишини тасдиқлайди [6].

Рус педагогикасида Е.П. Арнаутова педагог ва оила ўртасидаги ўзаро муносабатни ота-оналарни «тарбия объекти» сифатида эмас, балки тенг ҳуқуқли шерик сифатида кўриш зарурлигини асослаб, ҳамкорликнинг диалогик шаклларини тавсия этган [7]. Иқтисодий ҳамкорлик ва ривожланиш ташкилоти (OECD)нинг «Starting Strong V» ҳисоботида эса мактабгача таълимдан бошланғич мактабга ўтиш даврида мактабгача таълим муассасалари, мактаблар, оилалар ва жамоалар ўртасидаги ҳамкорлик сифатли ўтишнинг асосий шартларидан бири сифатида кўрсатилган [8].

Тадқиқотда тизимли ёндашув, норматив-ҳуқуқий ҳужжатлар ва илмий адабиётларни қиёсий таҳлил қилиш ҳамда моделлаштириш усулларидан фойдаланилди.

НАТИЖАЛАР

Таҳлиллар асосида МТТда ижтимоий ҳамкорликнинг асосий субъектлари ва улар билан ҳамкорлик мазмуни аниқланди (1-жадвал).

1-жадвал

Ҳамкорлик субъекти	Ҳамкорлик мазмуни	Ташкилий шакллар
Оила	Бола ривожланиши бўйича маълумот алмашиш, уйда ривожлантирувчи муҳит яратиш, қарорлар қабул қилишда иштирок	Индивидуал суҳбатлар, очиқ эшиклар куни, ота-оналар клуби, васийлик кенгаши, рақамли гуруҳ каналлари
Маҳалла	Ижтимоий ҳимояга муҳтож оилаларни аниқлаш, болаларни МТТга қамраб олиш, миллий қадриятлар асосидаги тадбирлар	Маҳалла фаоллари билан ҳамкорлик режаси, қўшма байрам ва тадбирлар
Умумтаълим мактаби	Мактабга ўтишни узвийлаштириш, ўқитувчилар ўртасида тажриба алмашиш	Қўшма методик семинарлар, бўлажак ўқувчилар учун мактабга экскурсия, ўзаро дарс ва машғулотларга кириш
Соғлиқни сақлаш муассасалари	Болалар саломатлигини мониторинг қилиш, ота-оналарнинг саломатлик саводхонлигини ошириш	Профилактик кўриклар, тиббиёт ходимлари иштирокидаги маслаҳатлар
Маданият, спорт муассасалари, кутубхоналар	Болаларнинг эстетик ва жисмоний ривожланиши, китобхонликка қизиқтириш	Экскурсиялар, тўгараклар, китоб байрамлари
Нодавлат ташкилотлар, тадбиркорлар, ҳомийлар	Моддий-техник базани мустаҳкамлаш, инновацион лойиҳаларни амалга ошириш	Ҳамкорлик шартномалари, грант ва ижтимоий лойиҳалар

Иккинчи натижа сифатида МТТ раҳбари томонидан ижтимоий ҳамкорликни бошқаришнинг тўрт босқичли модели ишлаб чиқилди:

1. Диагностик-таҳлилий босқич. МТТ жойлашган ҳудуднинг ижтимоий инфратузилмаси (мактаблар, маҳалла, поликлиника, кутубхона, корхоналар) харитаси тузилади; оилаларнинг эҳтиёж ва имкониятлари сўровнома орқали ўрганилади; ташкилотнинг ҳамкорлик борасидаги кучли ва заиф томонлари аниқланади.

2. Лойиҳалаш-режалаштириш босқичи. Ҳар бир ҳамкор билан аниқ мақсад, масъул шахс, муддат ва кутилаётган натижа кўрсатилган йиллик ҳамкорлик режаси тузилади; зарур ҳолларда ҳамкорлик шартномаси ёки меморандуми имзоланади. Режалаштиришда Ж. Эпштейннинг олти тури асосида ҳамкорлик йўналишлари мувозанатланади [5].

3. Амалга ошириш босқичи. Режадаги тадбирлар ташкил этилади; педагоглар ота-оналар билан мулоқотнинг диалогик шаклларига ўргатилади; ҳамкорлик жараёнига ота-оналар ва маҳалла вакиллари ташаббускор сифатида жалб этилади.

4. Мониторинг ва рефлексия босқичи. Ҳамкорлик натижалари белгиланган мезонлар асосида баҳоланади, ота-оналар ва ҳамкорлар фикри ўрганилади, кейинги йил режасига тузатишлар киритилади.

Учинчи натижа — ижтимоий ҳамкорлик самарадорлигини баҳолаш мезонлари. Улар қуйидагича белгиланди: *қамров мезони* (ҳамкорликка жалб қилинган оилалар ва ташкилотлар улуши); *фаоллик мезони* (ота-оналарнинг тадбирларда нафақат иштирокчи, балки ташкилотчи сифатида қатнашиши); *натижавийлик мезони* (ҳамкорлик натижасида болалар ривожланиши, мактабга тайёрлик, моддий-техник базада рўй берган ўзгаришлар); *қониқиш мезони* (ота-оналар ва ҳамкорларнинг ҳамкорлик сифатидан қониқиш даражаси); *барқарорлик мезони*

МУҲОКАМА

Ишлаб чиқилган модель ижтимоий ҳамкорликни тасодифий тадбирлар йиғиндиси эмас, балки раҳбар томонидан режалаштириладиган, амалга ошириладиган ва баҳоланадиган бошқарув жараёни сифатида кўриш имконини беради. Бу ёндашув У. Бронфенбреннер назариясидаги мезотизим ғоясига мос келади: оила, МТТ ва мактаб ўртасидаги алоқалар қанчалик мустаҳкам ва изчил бўлса, боланинг ривожланиш муҳити шунчалик барқарор бўлади

Амалиётда кенг учрайдиган муаммолардан бири — ота-оналарнинг ҳамкорликка кам жалб этилишидир. Е.П. Арнаутова таъкидлаганидек, бунинг сабаби кўпинча ота-оналарга фақат маълумот қабул қилувчи сифатида қаралишида бўлади [7]. Шу боис моделда ота-оналарни қарор қабул қилиш жараёнига (васийлик кенгаши, режаларни муҳокама қилиш) жалб этиш алоҳида таъкидланган. Хорижий тадқиқотлар ҳам оилаларнинг фаол, ташаббускор иштироки пассив иштирокига нисбатан кўпроқ ижобий натижа беришини кўрсатади [6].

Ўзбекистон шароитида маҳалла институти ижтимоий ҳамкорликнинг ўзига хос ва кучли ресурси ҳисобланади. Маҳалла орқали МТТга қамраб олинмаган болаларни аниқлаш, ижтимоий ҳимояга муҳтож оилаларга кўмаклашиш ва миллий қадриятларга асосланган тарбиявий тадбирларни ўтказиш имконияти мавжуд. Мактаб билан ҳамкорлик эса OECD ҳисоботида қайд этилганидек, болаларнинг мактабга силлиқ ўтишини таъминлашнинг муҳим шарти ҳисобланади [8]. Шу билан бирга, модельни амалиётга жорий этиш МТТ раҳбарларининг бошқарув компетенцияларини, хусусан, ҳамкорликни режалаштириш, музокара олиб бориш ва натижаларни баҳолаш кўникмаларини малака ошириш курсларида мақсадли ривожлантиришни талаб этади.

ХУЛОСА

1. Мактабгача таълим ташкилотларида ижтимоий ҳамкорлик боланинг ҳар томонлама ривожланиши учун ягона тарбиявий муҳит яратишга хизмат қилувчи бошқарув жараёни бўлиб, унинг назарий асосини экологик тизимлар ёндашуви ва ҳамкорлик турлари назарияси ташкил этади.

2. Ижтимоий ҳамкорликнинг асосий субъектлари — оила, маҳалла, умумтаълим мактаби, соғлиқни сақлаш, маданият ва спорт муассасалари, нодавлат ташкилотлар ва ҳомийлар бўлиб, уларнинг ҳар бири билан ҳамкорлик мазмуни ва шакллари аниқ белгиланиши зарур.

3. МТТ раҳбари томонидан ижтимоий ҳамкорликни бошқариш диагностик-таҳлилий, лойиҳалаш-режалаштириш, амалга ошириш ҳамда мониторинг ва рефлексия босқичларида изчил амалга оширилиши мақсадга мувофиқ.

4. Ҳамкорлик самарадорлигини қамров, фаоллик, натижавийлик, қониқиш ва барқарорлик мезонлари асосида баҳолаш тавсия этилади.

5. МТТ раҳбарлари ва мутахассисларининг малака ошириш дастурларига ижтимоий ҳамкорликни бошқаришга оид амалий модулларни киритиш мақсадга мувофиқдир.

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THE ROLE OF INDEPENDENT READING STRATEGIES IN DEVELOPING STUDENTS' DIGITAL INFORMATION LITERACY

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Abstract. The development of digital information literacy has become an essential component of higher education in the digital age. University students increasingly rely on online databases, electronic libraries, educational websites, digital textbooks, and artificial intelligence-supported tools to complete academic assignments and conduct research. However, access to a large amount of information does not necessarily guarantee the ability to identify reliable sources, evaluate evidence, recognise bias, and use information responsibly. This article examines the role of independent reading strategies in developing students' digital information literacy. Particular attention is paid to critical reading, source evaluation, selective reading, annotation, comparative reading, and reflective reading. The article also discusses pedagogical approaches that can help university students become more independent, critical, and responsible users of digital information.

Keywords: digital information literacy, independent reading, critical reading, digital pedagogy, source evaluation, information searching, academic reading, university students, information credibility, learner autonomy.

Introduction

Digital transformation has significantly changed the ways in which university students access, interpret, and use information. Traditional printed textbooks and library materials are now supplemented by electronic books, online academic journals, digital repositories, educational websites, and multimedia learning resources. These developments have created new opportunities for independent learning and academic research. At the same time, they have increased the importance of students' ability to evaluate information critically and distinguish reliable evidence from inaccurate, misleading, or irrelevant content. Digital information literacy extends beyond the technical ability to search the internet or operate digital devices. It involves identifying information

needs, locating relevant materials, evaluating their credibility, interpreting information in context, and using sources ethically. Students who lack these competencies may rely on superficial search results, accept unsupported claims, or reproduce information without examining its accuracy and relevance.

Independent reading strategies can play a significant role in addressing these challenges. Independent reading involves learners selecting, interpreting, and evaluating texts according to their learning objectives. When students read strategically, they learn to identify central arguments, compare different perspectives, examine supporting evidence, and connect new information with their existing knowledge. The importance of these abilities is particularly evident in higher education, where students are expected to prepare presentations, write academic papers, complete research projects, and engage with complex theoretical materials. Consequently, developing digital information literacy through independent reading should be considered an important educational objective. The purpose of this article is to analyse the relationship between independent reading strategies and digital information literacy and to identify practical approaches for developing these competencies among university students.

Theoretical Foundations of Digital Information Literacy. Digital information literacy is a multidimensional concept that combines information-searching skills, critical evaluation, digital reading, ethical information use, and independent decision-making. It enables learners to interact with digital information purposefully rather than accepting every available source as accurate or authoritative. The Association of College and Research Libraries (ACRL, 2016) presents information literacy as a set of interconnected abilities involving the discovery, evaluation, interpretation, and responsible use of information. This perspective is particularly relevant to university students because academic learning requires more than collecting facts. Students must understand how knowledge is produced, how evidence supports arguments, and how different sources contribute to scholarly discussion.

Digital environments present several challenges for information literacy. Search engines may display commercially promoted or highly popular content before more authoritative academic materials. Social media platforms can circulate information without adequate verification, while websites may present opinions as established facts. In addition, automatically generated content can contain unsupported statements or inaccurate references. For these reasons, students need systematic strategies for evaluating digital materials. They should examine authorship, publication context,

supporting evidence, publication date, purpose, and potential bias. The credibility of a source should not be determined solely by its visual appearance, popularity, or position in search results. Independent reading supports this process by encouraging learners to engage actively with information. Rather than passively receiving content, students formulate questions, identify key concepts, compare arguments, and assess whether the available evidence supports the conclusions presented.

Independent Reading Strategies and Their Educational Value. Independent reading is most effective when students understand how to select and apply different strategies according to their reading purposes. Several strategies are particularly useful for developing digital information literacy.

1. *Skimming and scanning*. Skimming involves reading a text quickly to identify its main idea, structure, and relevance. Scanning involves searching for specific information, such as a definition, date, statistic, or key term. These strategies help students manage the large volume of digital content available online. Before reading a lengthy academic article in detail, a student can examine its title, abstract, headings, and conclusion to determine whether it addresses the research question. The student can then locate specific evidence through targeted scanning. However, skimming and scanning should be used as preliminary strategies rather than substitutes for careful reading. Important academic claims require detailed examination of their context and supporting evidence.

2. *Critical reading.* Critical reading involves examining the reasoning, assumptions, evidence, and conclusions presented in a text. Students ask whether the author's claims are adequately supported, whether alternative explanations exist, and whether the evidence is relevant to the research question. For example, when reading an online article about the effectiveness of digital learning, students should distinguish between personal opinion, institutional reporting, theoretical discussion, and findings from empirical research. They should also consider whether the conclusions are justified by the evidence presented. Critical reading encourages intellectual independence because students learn to evaluate claims rather than accepting them automatically.

3. *Comparative reading.* Comparative reading requires students to examine two or more sources addressing the same topic. This strategy helps them identify similarities, differences, conflicting interpretations, and gaps in available knowledge. A university assignment might ask students to compare two articles discussing the use of artificial intelligence in education. Students could examine the authors' arguments, research methods, evidence, and conclusions before developing

their own position. Comparative reading also reduces dependence on a single source. By considering multiple perspectives, learners can develop a more balanced understanding of complex issues.

4. *Annotation and reflective reading.* Annotation involves recording questions, definitions, key arguments, and personal observations while reading. Digital annotation tools and electronic notes can help students organise information and return to important passages when preparing assignments. Reflective reading extends this process by encouraging learners to consider how a text changes their understanding of a topic. Students may identify information they previously misunderstood, recognise unanswered questions, or determine which ideas require further investigation. Together, annotation and reflection support deeper engagement with digital texts and help students transform collected information into meaningful knowledge.

Developing Source Evaluation Skills in Digital Environments. One of the central components of digital information literacy is the ability to evaluate the quality and credibility of online sources. Students should develop a systematic approach to examining information before using it in academic work. First, they should investigate authorship and expertise. Identifying the author, institutional affiliation, and relevant qualifications can provide useful context, although these factors alone do not establish that every claim is accurate. Second, students should examine the evidence supporting the information. Academic publications often provide references, methodological explanations, and data that can be checked against other sources. Unsupported claims and vague references should encourage further investigation. Third, students should consider the publication context and purpose. A scholarly article, an institutional report, an advertisement, and a personal blog may serve different purposes and therefore require different forms of evaluation. Fourth, students should check the date of publication when recency is important. Information about technology, legislation, or current educational policies may become outdated, while established theoretical works may remain relevant over longer periods. Fifth, students should compare claims with independent sources. The lateral reading approach encourages readers to leave the original webpage temporarily and investigate what other reliable sources say about the author, organisation, or claim. This can reveal important information that is not apparent from the webpage itself.

The Stanford History Education Group's research on civic online reasoning has highlighted the importance of teaching learners to evaluate digital information through evidence-based practices rather than relying only on the appearance of a website. Source evaluation should therefore be incorporated into regular reading assignments rather than taught as an isolated theoretical topic.

Conclusion. Independent reading strategies are important instruments for developing digital information literacy among university students. Skimming, scanning, critical reading, comparative reading, annotation, and reflective reading help learners identify relevant information, evaluate source credibility, interpret evidence, and develop independent academic judgements. In higher education, these competencies contribute to stronger research practices, more responsible information use, and greater learner autonomy. Their development requires systematic instruction, regular practice, access to appropriate digital resources, and assessment criteria that reward critical engagement with information.

Universities should therefore integrate digital information literacy into independent study, academic reading, research writing, and subject-specific learning activities. By combining strategic reading with evidence-based evaluation, higher education can prepare students to navigate increasingly complex digital information environments with confidence and responsibility.

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HPV-BASED SCREENING AND MOLECULAR DIAGNOSTICS IN THE PREVENTION OF CERVICAL CANCER: CLINICAL PERFORMANCE, REAL-WORLD EVIDENCE, AND IMPLEMENTATION PRIORITIES

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Abstract

Background: Persistent infection with carcinogenic human papillomavirus (HPV) is a necessary causal factor in most cervical cancers, but a positive molecular assay is not equivalent to precancer or invasive disease. The transition from cytology-centred prevention to validated high-risk HPV testing has changed the evidentiary basis of screening, triage, surveillance and programme evaluation. Objective: To critically integrate evidence on HPV DNA and mRNA testing, partial and extended genotyping, p16/Ki-67 dual staining, host and viral methylation, self-collection, artificial intelligence and longitudinal real-world data, with particular consideration of feasible implementation in Uzbekistan. Methods: This is a critical integrative evidence review, not a prospectively registered systematic review or a primary patient-level analysis. Official WHO, FDA, EMA and ASCCP recommendations and identifiable studies were prioritised; diagnostic accuracy and clinical-outcome evidence were distinguished from feasibility reports and hypotheses. Propensity-score methods, inverse probability weighting, target-trial emulation, longitudinal survival models and machine-learning validation are discussed as appropriate designs for future registry-based evaluations, not reported as analyses performed on a fabricated cohort. Results: WHO recommends validated HPV DNA testing as a preferred screening modality within locally implementable screen-and-treat or screen-triage-and-treat pathways. Molecular genotyping and dual-stain assessment improve risk stratification among individuals testing HPV-positive, while self-sampling can reduce participation barriers when collection devices and assays are validated and positive results trigger timely follow-up. Evidence of test accuracy does not by itself establish a reduction in mortality; linkage to colposcopy, histology, treatment and post-treatment surveillance remains decisive. Artificial intelligence may support digital cytology and quality assurance but is vulnerable to spectrum shift, verification bias and unequal

performance. Discussion: Regulatory-grade evidence requires explicit target populations, assay specifications, complete follow-up, calibration and transparency regarding clinical thresholds. Context-specific health-information systems can quantify missed follow-up and inequalities, although causal claims require stronger designs. Conclusion: Integrated HPV-based prevention should prioritise coverage, validated diagnostics, risk-adapted triage, safe treatment and verifiable surveillance rather than technology acquisition alone.

Keywords: cervical cancer; human papillomavirus; HPV DNA; HPV mRNA; molecular screening; extended genotyping; p16/Ki-67; cervical intraepithelial neoplasia; self-sampling; real-world evidence; artificial intelligence; Uzbekistan.

1. Introduction

Cervical cancer prevention is unusual among cancer-control programmes because a preventable infection occupies a central place in the causal pathway. Persistent carcinogenic HPV infection may produce transforming cellular alterations, subsequently leading to high-grade cervical intraepithelial neoplasia and, in a minority of affected individuals, invasion. The interval between infection and clinically apparent malignancy provides a window for screening. Nevertheless, most HPV infections resolve, and molecular positivity should never be conflated with a diagnosis of cervical malignancy. The clinically important question is not simply whether viral nucleic acid can be detected but whether an accessible programme can correctly identify those who need evaluation or treatment while avoiding unnecessary interventions [1–5].

The WHO elimination framework identifies a target incidence below four cases per 100,000 women-years and the complementary 90–70–90 goals for vaccination, high-performance screening and treatment by 2030 [1]. WHO's 2024 guidance reports approximately 662,000 incident cervical cancer cases and 349,000 deaths worldwide in 2022 [4]. These estimates describe the global burden, not the incidence among screened individuals, and should not be interpreted as a locally measured Uzbek rate. Programme performance depends on the full cascade from invitation through result communication, colposcopy or treatment when indicated, follow-up and quality assurance.

High-risk HPV nucleic acid amplification tests detect exposure-related viral targets and generally offer greater sensitivity for detecting high-grade precancer than cytology alone, although specificity and positive predictive value vary with age, vaccination

history, sampling and the underlying disease prevalence [2,3]. The WHO supports clinician-collected and validated self-collected samples for HPV DNA testing [2]. Genotyping, cytology, dual staining and selected molecular adjuncts are not interchangeable laboratory products: their purpose is to move a patient from a screening-positive state to a calibrated management decision. Performance claims should specify CIN2+, CIN3+ or cancer as the reference endpoint and whether disease verification was complete.

Real-world data (RWD) are routinely collected observations describing health status, services and outcomes, including electronic records, laboratory interfaces, registries, administrative claims and patient-reported information. Real-world evidence (RWE) comprises clinical inferences obtained from appropriately analysed RWD. The existence of digital records does not automatically establish a causal effect. Data completeness, treatment selection, prevalent disease and follow-up all determine whether credible RWE is possible. In cervical screening, registry-based investigations can measure coverage, failures of follow-up, time to colposcopy and interval-cancer risk, whereas properly conducted randomized trials (RCTs) are particularly important for estimating effects of invitations, modalities or management strategies [7,8].

An RCT assigns exposure prospectively and thereby reduces measured and unmeasured baseline confounding in expectation. A pragmatic trial may preserve routine practice while retaining randomization; an observational comparison needs careful design to avoid confounding by indication, immortal-time bias, differential surveillance and selection. Efficacy denotes an intervention's performance under specified trial conditions, whereas effectiveness refers to the outcome in ordinary systems with heterogeneous uptake and adherence. A highly sensitive assay may yield little population benefit when positive results are not acted upon; conversely, modest gains in participation through self-collection may be consequential even without improving intrinsic analytic sensitivity [6,9].

FDA guidance addresses whether RWD are sufficiently relevant and reliable to support decisions about medical devices; the European Medicines Agency (EMA) has developed an RWE framework and the DARWIN EU distributed-data environment for regulatory questions [7,8]. These initiatives do not imply regulatory endorsement of any specific HPV assay or AI model. WHO guidance on artificial intelligence stresses clinical benefit, transparency, accountability, inclusiveness and protection from automation bias [10]. For cervical screening, machine learning may assist image

interpretation or follow-up prediction, but prospective evaluation remains essential before clinical deployment.

The present article therefore adopts a focused clinical hypothesis: the public-health value of HPV molecular diagnostics depends on the interaction of analytical validity, clinically meaningful triage, treatment capacity and trustworthy longitudinal information. The primary question concerns cervical cancer prevention. Examples from diabetes, cardiology, oncology, infectious disease and neurology are examined only as methodological comparators for effectiveness prediction, not as unrelated results presented as cervical-screening evidence.

2. Materials and Methods

2.1 Review design and scope

This work is a critical integrative narrative review with an explicit evidence hierarchy. It does not claim to be a PRISMA-compliant systematic review, and no invented numbers of screened records, excluded abstracts or pooled study effects are reported. The evidence base is anchored in WHO cervical screening and elimination recommendations, FDA assay and RWE guidance, EMA regulatory materials and ASCCP risk-based management publications, supplemented by identifiable trials and reviews. PubMed-indexed research and primary journal records are preferred for biomedical conclusions. Scopus, Web of Science, Embase, Cochrane Library, Nature Medicine, The Lancet, NEJM and JAMA are relevant potential indexing or publication sources, but we do not claim exhaustive interrogation of paid subscription databases without a reproducible search export.

A reproducible future search should combine (cervical cancer OR cervical intraepithelial neoplasia OR CIN3 OR CIN2) AND (HPV DNA OR HPV mRNA OR genotyping OR self-sampling OR dual stain OR methylation) AND (screening OR triage OR implementation OR real-world). Separate search blocks should cover diagnostic test accuracy, cervical cancer incidence or mortality, participation and retention, health economics and AI validation. Priority is placed on 2020–2026 guidelines and studies, with older landmark randomized evidence retained when it informs clinical outcomes. Eligible evidence includes externally validated accuracy studies, randomized screening evaluations, population registries, systematic reviews and official guidance. Exclude studies without an identifiable endpoint, assay specification

or meaningful reference standard from quantitative comparison; discuss them narratively as hypothesis-generating where appropriate.

2.3 Extraction and synthesis

For each source, the appropriate extraction fields are design, country, sample frame, age, HIV status, HPV vaccine exposure, index test, threshold, triage sequence, verification procedure, endpoint, horizon, precision and follow-up completion. Sensitivity and specificity estimate conditional test properties; positive and negative predictive values change with prevalence. For observational programme endpoints, distinguish first-round yield from incidence after repeat screening. An unpooled critical synthesis is warranted when assays, populations and reference standards are heterogeneous. Publication-level percentages are attributed to the original study or organization rather than generalized to all settings.

2.4 Propensity-score matching and inverse-probability weighting

For comparative evaluations in routine care, estimate the propensity for receiving an HPV-based versus cytology-based screening invitation from pretreatment covariates: age, area, deprivation, screening history, pregnancy, immunocompromise and service access. Matching can restrict analysis to patients with comparable scores, with balance assessed using standardized mean differences rather than a significance test. Inverse probability of treatment weighting creates a weighted pseudo-population; extreme probabilities require positivity checks and stabilized or truncated weights. These methods address only measured confounding and cannot repair absent ascertainment of CIN3+ or differential pathology verification.

2.5 Target trial emulation and causal inference

Specify time zero as eligibility and screening assignment or invitation, rather than the day of a result that already depended on attendance. Define eligibility, intervention strategies, assignment, follow-up, outcomes, estimand and analysis plan before comparison. Intention-to-screen evaluates outreach policies; per-protocol approaches require adjustment for time-varying adherence and censoring. Causal diagrams should separate mediators such as colposcopy attendance from baseline confounders, avoiding inappropriate adjustment. Instrumental-variable claims need credible exclusion restrictions; an invitation instrument may fail if outreach affects other care pathways.

2.6 Survival analysis

Kaplan–Meier estimators can summarize time from positive HPV test to completion of triage where noninformative censoring is plausible. Cox regression can estimate hazard ratios for clinically defined outcomes while testing proportional-hazards assumptions; a hazard ratio is not a risk ratio. Competing risks and interval-censored precancer detection can make simple survival models misleading. For cancer endpoints, screen-detected disease and deaths require attention to lead-time bias, length bias and differential surveillance. Here these are recommended designs, not analyses claimed to have been executed.

2.7 AI methods and validation

Machine-learning algorithms may model structured data using regularized logistic regression, random forests or boosted trees; deep learning may process digitized cytology or colposcopy images; NLP may extract referrals and pathology features; large language models may assist with document classification under clinician review. Reinforcement learning has been proposed for sequential policies but should not guide actual treatment without rigorously verified safety. Evaluate independent held-out sites, temporal drift, AUROC together with calibration, sensitivity at chosen clinical thresholds, subgroup performance, decision-curve utility and prospective impact. Split data at patient and site levels to avoid leakage between repeat samples.

3. Results: Critical Evidence Synthesis

3.1 Causal biology and screening targets

The viral life cycle and progression pathway provide the rationale for screening while revealing why viral positivity alone is an imperfect surrogate for clinically consequential disease. Carcinogenic HPV types may persist in the transformation zone, and expression of viral oncogenes E6 and E7 interferes with cellular tumor-suppressor pathways. Histological CIN2 is biologically heterogeneous and can regress, whereas CIN3 is a more robust precursor endpoint for comparative risk assessment. Molecular assays generally test for carcinogenic viral nucleic acids rather than directly proving transforming disease. Therefore, a screening programme needs a structured pathway after positive results; the assay is the entry point rather than the therapeutic endpoint [2–5].

Interpretive implication: The causal chain supports measuring progression-relevant endpoints rather than treating all HPV-positive tests as equivalent clinical events.

3.2 HPV DNA as primary screening modality

WHO recommends HPV DNA testing in primary screening beginning at age 30 years in the general population and a younger initiation age for women living with HIV, with intervals depending on population and strategy [2]. Screening intervals should not be transferred uncritically from an international guideline to a national policy without verification of local eligibility, treatment capacity and vaccination coverage. High sensitivity confers a potentially reassuring negative test but also generates referrals when transient infections predominate. Screening benefit derives from earlier precancer diagnosis followed by treatment, not merely from detecting more HPV infections [2,3].

Interpretive implication: A negative high-risk HPV test offers programmatic reassurance only when platform validation, sampling quality and rescreening mechanisms are maintained.

3.3 HPV mRNA testing and translational caveats

E6/E7 mRNA tests seek transcriptional activity associated with transforming infection, yet test performance depends on covered viral types and diagnostic cutoffs. WHO published a specific 2021 recommendation set for mRNA testing and contextualized its use among nucleic-acid testing options [3]. Some investigations find increased specificity for particular mRNA-based approaches, but this cannot be assumed for every platform or every sampling medium. Clinical validation and locally implementable triage are prerequisites. Comparisons should stratify by age, HIV status and histology rather than pooling uncommensurable subgroups.

Interpretive implication: Comparative studies should use the same specimens, a prespecified reference standard and clinically relevant follow-up intervals.

3.4 Partial and extended genotyping

HPV16 and HPV18 carry particular clinical importance, and genotype-aware management can distinguish higher-risk from lower-risk screening-positive groups. The 2025 ASCCP Enduring Consensus guidance incorporated extended genotyping information from Onclarity-based cohorts into risk-threshold management; colposcopy is recommended after HPV16/18 positivity, while selected other genotypes are triaged with cytology or dual stain [5]. Such recommendations are assay-specific and jurisdiction-sensitive. A type-group result should not be treated as equivalent to complete individual genotyping. Longitudinal risk calibration after

vaccination will require repeated updates because genotype distributions and baseline risk change.

Interpretive implication: Referral thresholds should be calibrated against absolute CIN3+ risk rather than assumed solely from genotype ordering.

3.5 Dual-stain cytology and triage

The immunocytochemical p16/Ki-67 dual-stain approach identifies cells with aberrant proliferative signaling and has a role in triage of HPV-positive screening results. WHO issued guidance on dual-stain triage in 2024 [4]. Technical reproducibility relies on slide preparation, staining, reader training and quality control. A dual-stain negative result should be interpreted within the chosen risk-based algorithm and follow-up interval, not as a universal guarantee of freedom from disease. A molecular triage programme may lower unnecessary colposcopy while retaining sensitivity, but its true value also depends on referral adherence and cost.

Interpretive implication: A triage technology is valuable only when it improves the balance between cancer prevention and avoidable diagnostic procedures.

3.6 Host methylation, viral methylation and emerging biomarkers

Host and viral DNA methylation panels, p16-related pathways, cellular proliferation signatures and combined molecular classifiers seek to distinguish transient infection from lesions likely to persist or progress. Their promise is biologically plausible, yet assay thresholds, pre-analytical effects, external validity and downstream management consequences vary. Evidence should separate proof-of-concept case-control accuracy from prospective screening-population validation. A high AUROC may coexist with a poor positive predictive value at low disease prevalence. New biomarkers should not replace validated WHO-supported screening algorithms in routine services solely because a development study reports attractive discrimination.

Interpretive implication: Before clinical adoption, proposed panels need multi-site blinded validation and analysis of added net benefit beyond established triage.

3.7 Self-collected HPV testing and participation

Self-collected vaginal samples can reduce embarrassment, travel and appointment barriers, particularly for individuals with limited access to pelvic examinations. A systematic review of randomized and observational participation studies reported greater uptake with self-sampling than control strategies, pooled RR 2.13 (95% CI

1.89–2.40) across 33 studies, while noting substantial representation of high-income settings [12]. This is a relative effect on screening participation, not the sensitivity of the assay or a measured reduction in cervical cancer deaths. In May 2024 FDA expanded approved cobas HPV testing to defined self-collected vaginal specimens, subject to the corresponding indication and instructions [6].

Interpretive implication: Self-collection is an access intervention and a diagnostic pathway; the two mechanisms require separate effectiveness evaluation.

3.8 Clinical-outcome evidence from randomized trials

The landmark cluster-randomized trial in rural India enrolled 131,746 women across comparison groups and found fewer advanced cancers and cervical cancer deaths after HPV screening compared with standard care; the hazard ratio for advanced disease was 0.47 (95% CI 0.32–0.69) and for cervical cancer death 0.52 (95% CI 0.33–0.83) [11]. These trial findings demonstrate that a completed diagnostic-treatment pathway can produce measurable population benefit, while the study setting and intervention era limit direct transportability to 2026 screening programmes. Contemporary vaccination exposure, infrastructure and triage options differ markedly.

Interpretive implication: Population outcome trials and accuracy studies answer distinct questions and should not be numerically conflated.

3.9 Vaccination, screening and the interpretation of residual risk

HPV vaccination lowers infection with vaccine-targeted oncogenic types but does not eliminate the need for screening in populations for which screening remains recommended. Vaccination status and birth cohort alter prevalence and thereby the positive predictive value of HPV tests. National programmes should avoid treating vaccination registries and screening registries as independent silos: linking these data can support assessment of equitable coverage and schedule changes, provided data governance is explicit. Ecological comparisons without individual linkage cannot distinguish vaccine impact from secular changes in sexual behavior, assay mix or healthcare access.

Interpretive implication: Longitudinal analyses of vaccine and screening interactions require age-cohort stratification and repeated monitoring.

3.10 Referral, colposcopy and histopathology

After HPV positivity, risk-based decisions may include repeat testing, reflex cytology, dual stain or colposcopy according to genotype, prior history and local guideline. Histopathology remains decisive when a biopsy is indicated, and pathology quality must be integrated into screening quality assurance. Women experiencing a positive test but no completed triage may be incorrectly counted as screened successfully; programmes must instead distinguish initial coverage, proportion with valid results, referral completion, treatment completion and surveillance. Clinical communication is essential because poorly explained results can increase anxiety and disengagement.

Interpretive implication: Failure to complete referral is a measurable patient-safety event and should trigger navigation efforts rather than be treated as an administrative inconvenience.

3.11 Digital cytology and AI-assisted interpretation

Deep-learning classification of cytology and colposcopy images is sensitive to staining, image resolution, scanner differences, referral population enrichment and verification procedures. An algorithm trained primarily on highly abnormal images may show appealing internal accuracy but over-refer a low-prevalence screening cohort. AI should be judged at a clinically selected sensitivity and referral burden, not a single aggregate AUROC. Calibration, out-of-distribution monitoring and human override options are indispensable. AI-supported image assessment is not interchangeable with a validated primary HPV molecular assay.

Interpretive implication: The appropriate primary outcome for an AI-assistance trial is clinical decision quality and downstream burden, not isolated retrospective image classification.

Electronic medical records capture symptoms, diagnoses and follow-up but frequently lack complete records of outside laboratory testing. E-prescriptions help document treatment and analgesic or procedural medication exposure but do not verify that precancer was cured. Laboratory databases record HPV test platform, genotype and specimen type when interfaces are structured. National cancer registries can support linkage to invasive cancer outcomes, while immunization registries define prior HPV vaccine exposure. Pharmacovigilance systems monitor suspected vaccine or treatment-related adverse events, but spontaneous reporting cannot by itself

estimate incidence. Insurance claims may measure services and utilization; wearables and mobile applications may support appointment reminders and patient-reported barriers. Each source must have provenance, denominators and purpose-specific quality assurance.

Interpretive implication: RWD diversity is valuable when linkage preserves valid denominators, dates and the distinction between observation and inference.

3.13 Data harmonization and interoperability

For a prospective national screening registry, minimum data elements include a unique pseudonymized patient key, date of birth, district, eligibility criteria, vaccine history, screening date, assay manufacturer, sample collection setting, genotype category, cytology or dual-stain results, triage recommendation, referral dates, biopsy findings, treatment method, complications and follow-up outcome. Consistent SNOMED, ICD and laboratory coding should be adopted only with local governance and validated mapping. Missing data must be classified as not measured, result pending, participant lost, or true negative; collapsing these states biases programme success estimates.

Interpretive implication: Interoperability is a scientific validity problem as much as a software engineering problem.

3.14 EHR, e-prescriptions, laboratory and registries

An electronic health record may identify longitudinal screening encounters, yet encounter-based denominators over-represent frequent service users. Electronic prescription systems can identify medication treatment surrounding procedures and prevent some duplication, although cervical neoplasia treatment is not usually captured fully through pharmaceutical dispensing. Laboratory information systems need versioned assay names and thresholds, since replacement instruments can induce apparent temporal changes in HPV positivity. National registries may clarify cancer incidence only after deduplication and stable linkage. These complementary databases create useful RWD when their sampling frames and validation errors are documented.

Interpretive implication: Historical screening comparisons must adjust for assay changes and ascertainment drift.

3.15 Pharmacovigilance, signal detection and analytics

Adverse drug reactions are clinically relevant for procedural treatments, anesthetics, supportive therapies and prophylactic medicines; vaccine safety must be interpreted using appropriate vaccine pharmacovigilance methods. Disproportionality metrics such as reporting odds ratios identify possible signals from spontaneous reporting, not causal effects or absolute event risks. Signal validation requires clinical case review, background rates, temporality and confounding assessment. Registry-based active surveillance can complement passive safety reporting but needs a defined exposed denominator. For HPV screening, excessive interventions after false-positive results and loss to follow-up after true-positive results are additional programme safety outcomes.

Interpretive implication: Pharmacovigilance supports safety monitoring but cannot replace controlled comparative effectiveness evaluation.

3.16 Machine learning, NLP, reinforcement learning and LLMs

Structured-data machine learning can estimate probability of failing follow-up and prioritize outreach; NLP can identify cytology and pathology terminology in notes; large language models can draft patient communications with safeguards and clinician review. Deep learning can segment or classify cytology images. Reinforcement learning for triage sequence optimization remains exploratory because unsafe exploration is unacceptable in clinical care. Each application requires evidence for transportability, language-specific accuracy, privacy and utility. A programme should compare any AI workflow against a simple rules-based reminder system before adopting a complex model.

Interpretive implication: AI should amplify a validated screening cascade instead of obscuring accountability for missed diagnosis.

3.17 Predicting treatment effectiveness across disease areas

Examples from diabetes, cardiovascular disease, oncology, infectious diseases and neurology show that medication effectiveness prediction depends on explicit outcomes, treatment adherence, baseline severity and indication bias. Those lessons transfer methodologically to HPV vaccination or cervical precancer management, but numerical effect sizes from unrelated diseases cannot validly estimate screening benefit. Pharmacogenomics and pharmacogenetics may explain interindividual drug response in selected diseases; however, no general pharmacogenetic test has been

established as a routine substitute for HPV DNA screening or histological triage. Precision prevention of cervical cancer is currently better grounded in viral genotype, screening history, immune status, vaccination and pathology.

Interpretive implication: Disease-spanning prediction frameworks inform study design but do not constitute new clinical results for HPV prevention.

3.18 Uzbekistan implementation priorities

A feasible Uzbek implementation strategy begins with an auditable pathway rather than unverified assertions about the existing coverage or performance of national systems. The Ministry of Health and regional programmes could establish standardized eligibility, laboratory accreditation, referral tracking, quality indicators and protected data linkage. Existing or developing electronic health, e-prescription and cancer-registry infrastructure should be evaluated for actual interoperability rather than presumed to be complete. Pilot sites should report eligibility denominators, tested proportion, positivity, follow-up within specified intervals, histologically confirmed CIN3+, overtreatment, patient costs and rural-urban inequities. Independent local evaluation is needed before nationwide AI deployment.

Interpretive implication: A phased local registry trial offers more credible evidence than launching unvalidated risk models at national scale.

Technology / strategy	Main purpose	Key limitation / action
Validated hrHPV DNA	Primary risk detection	Positive result needs protocol-based triage; [2]
HPV E6/E7 mRNA	Molecular screening option	Assay-specific validation; [3]
HPV16/18 and extended genotyping	Risk stratification	Thresholds depend on assay and history; [5]
p16/Ki-67 dual stain	Triage after hrHPV positivity	Reader quality and follow-up; [4]
Self-collected sample	Improve screening access	Validated assay/specimen combination; [6,12]
Methylation panels	Emerging stratification	Prospective external evidence required
AI cytology	Reader support / triage research	Calibration, bias and device oversight

Evidence	Documented quantitative finding	Appropriate interpretation
WHO global 2022 estimate [4]	~662,000 cases; ~349,000 deaths	Global burden, not Uzbek incidence
WHO elimination goals [1]	90% vaccination; 70% screening; 90% treatment	Targets, not achieved performance
Self-sampling meta-analysis [12]	RR 2.13 (95% CI 1.89–2.40)	Screening uptake; not diagnostic accuracy
India cluster RCT [11]	HR 0.52 (95% CI 0.33–0.83)	Cervical cancer death vs usual care, specific context

3.20 Screening pathway design in immunocompromised groups

Screening schedules derived from general populations should not automatically be applied to individuals living with HIV, transplant recipients or those experiencing prolonged immunosuppression. Earlier acquisition, persistence of carcinogenic HPV and increased burden of high-grade lesions can alter the relationship between molecular detection and future disease. A valid implementation programme must encode immunocompromise in eligibility and recall systems, with access-controlled documentation that does not disclose sensitive status. The WHO 2021 guideline distinguishes recommendations for women living with HIV from those for the general population [2,18]. Comparisons should describe immune status, antiretroviral treatment and prior screening history before attributing observed differences to HPV technology.

The practical implication is to create stratified screening registers and risk-adapted recall pathways rather than a single undifferentiated digital reminder rule. Confirmation of sample adequacy and outcome ascertainment becomes more important when high-risk groups are underrepresented in trial datasets. Screening success should be measured by completed care, not the proportion issued an electronic invitation. Health-system audits should also identify whether privacy concerns produce differential loss to follow-up.

3.21 Pregnancy, fertility concerns and conservative management

An abnormal HPV-based result during pregnancy presents a different balance of diagnostic reassurance, procedural risk and timing than routine nonpregnant screening. HPV nucleic acid detection itself does not mandate an invasive procedure, and pregnancy-specific recommendations should determine when colposcopy or biopsy is indicated. The objective is to avoid missing suspected invasive cancer while

preventing unnecessary interventions in women with lesions that can be reassessed after delivery. Programme software should distinguish pregnancy status and anticipated follow-up windows and should never implement a generic expedited-treatment algorithm without clinician review [9].

Longitudinal studies that assess adverse pregnancy outcomes after cervical procedures must distinguish the causal effects of treatment from prior obstetric risk, infection, smoking and socioeconomic circumstances. For patients seeking future fertility, shared decisions should describe the tradeoff between sufficient treatment of high-grade disease and consequences of excessive cervical excision. RWD can support counselling when indication bias is acknowledged; an observational association between treatment and a later outcome is not by itself proof of treatment harm.

3.22 Negative results, interval cancers and quality failures

Post-screening reassurance requires a clear account of false-negative mechanisms. Sampling may miss abnormal cells, a molecular platform may fail due to inhibition, or a cancer may arise in a location difficult to sample. Administrative errors can also generate apparent negatives when rejected specimens or uncommunicated results are coded as normal. Screening registries should therefore distinguish analytical failures, specimen inadequacy, not-tested states and genuinely negative laboratory results. Interval cancers after a documented negative screen are priority sentinel events for blinded case review; they should not be automatically ascribed to assay insensitivity.

A structured case audit examines specimen collection, assay validity, interpretation, referral processes, pathology review and competing clinical diagnoses. Laboratory proficiency panels and repeat testing of selected stored specimens can identify batch effects, but retrospective retesting must respect consent and specimen storage conditions. Cancer incidence after screening must be interpreted with appropriate lead-time and surveillance adjustment. These evaluations provide stronger safety evidence than a dashboard reporting aggregate screening positivity alone.

3.23 Test accuracy metrics and clinical utility

Sensitivity is the probability of a positive test in the target disease state and specificity is the probability of a negative result without that state. These quantities are not constant across histologic thresholds, sample types, age or comparator protocols.

Positive predictive value additionally depends on prevalence and therefore declines when the background burden of CIN3+ decreases after successful vaccination, even if sensitivity is stable. Diagnostic likelihood ratios can help translate pre-test to post-test odds, but clinicians need an actionable risk threshold and an understood consequence of intervention.

Net benefit and decision-curve analysis are useful when the practical comparison is between more colposcopies and fewer missed clinically significant lesions. A model with a slightly higher AUROC may yield no clinically useful improvement if the gain lies outside the range of referral thresholds. Clinical utility studies should report absolute numbers of colposcopies, biopsies, CIN3+ detections, delayed diagnoses and unnecessary treatments per defined eligible population. It is scientifically misleading to compare products by a single vendor-reported sensitivity without specifying the validation population and reference standard.

3.24 Equity and patient-centred programme design

Participation is shaped by health literacy, transport, work obligations, stigma, linguistic barriers and trust in medical institutions. Self-collected sampling can address some obstacles, yet it can also exclude women who lack a private setting, a reliable delivery channel or understandable instructions. A programme that sends kits indiscriminately without a tested return logistics chain may record invitations rather than completed screening. Local qualitative studies should guide invitation formats, reminder schedules, specimen handoff and communication of an HPV-positive result.

Equity should be assessed with denominators by age, geography, disability-related access need and socioeconomic category where lawful and ethically appropriate. The aim is to distinguish gaps caused by insufficient outreach from gaps caused by referral bottlenecks or cost. Community engagement is not a substitute for scientific evaluation, but it can identify why an apparently technically successful service fails in practice. Patient-reported measures should include anxiety, perceived autonomy, confidentiality and understanding of subsequent management.

3.25 Economic evaluation and procurement decisions

Laboratory purchasing decisions should be framed in terms of total programme cost and outcomes rather than price per assay. Relevant cost components include personnel training, specimen collection, transportation, molecular platforms, reagent supply, quality-control panels, repeat testing, result communication, colposcopy,

histology, treatment, surveillance and the cost of navigating missed follow-up. Self-collection may reduce the clinic contact cost while adding distribution and laboratory logistics, so its incremental cost-effectiveness is conditional on uptake and downstream adherence.

Health economic models should specify time horizon, discounting, baseline incidence, HPV vaccination assumptions, test performance, transition probabilities and treatment capacity. Sensitivity analyses must explore plausible ranges rather than presenting one deterministic answer as universally applicable. For Uzbekistan, unit-cost and access data must be gathered locally before claiming savings or a favourable incremental cost-effectiveness ratio. Cost-reduction targets should not drive procurement of tests lacking demonstrated clinical validation.

3.26 Micro-level RWD architecture and data governance

The minimal dataset must preserve temporal ordering. A test ordered on one date, collected later, processed by a specific platform and communicated still later has several distinct timestamps that are essential to estimate delays. Registries should record invitation and consent status, collection mode, laboratory result, genotype or triage findings, recommended action, action actually completed, pathology, therapy and subsequent screening. For each record, source system, code version, change history and responsible laboratory should be identifiable to authorized reviewers.

Data protection is not solved by deleting patient names while preserving unconstrained linkage keys. A governance protocol should define controller responsibilities, permitted use, retention, access audits, secure transfer and breach response. Missing records may have clinical meaning: an absent histology report could imply no biopsy, biopsy elsewhere or incomplete linkage. Rather than automatically imputing an outcome, the programme should distinguish missingness causes and initiate quality investigations. Analytic readiness requires clinical oversight as well as technical interoperability.

3.27 Designing a prospective pragmatic evaluation in Uzbekistan

A pragmatic stepped-wedge or cluster-randomized implementation design could compare standard invitation pathways with a validated HPV self-sampling and navigation programme across participating districts, provided there is genuine equipoise and sufficient capacity for treatment of screen-detected disease. Alternatively, a carefully emulated target trial could compare staggered rollouts, using

a prespecified eligibility definition and common time zero. The primary endpoint could be completion of indicated follow-up within an agreed interval, with secondary endpoints including CIN3+ yield, patient experience and resource use. Sample-size calculation must follow locally observed baseline rates and prespecified effect size; no artificial enrollment target should be inserted into the protocol.

A data safety monitoring mechanism should review unexpected delays or excessive referrals. Analyses ought to account for clustering, baseline differences and potential contamination between facilities. Before scaling, investigators must test whether data systems correctly link repeat HPV tests, biopsies and referrals. Publication should report CONSORT extension requirements for any randomized implementation trial or STROBE principles for the observational version. A pragmatic assessment would allow decision-makers to judge real programme effectiveness while avoiding false equivalence between imported efficacy estimates and local clinical outcomes.

3.28 Regulatory validation of algorithms and diagnostics

Regulatory science begins with a declared intended use: primary screening, adjunctive triage, referral prioritization or research-only decision support. Evidence for one use is not proof for another. Device documentation should include analyte targets, specimen collection instructions, reproducibility, analytical interference, defined clinical populations and laboratory performance checks. For algorithmic triage, locked-model testing should precede prospective clinical evaluation, and version updates should trigger review of calibration and safety. FDA good machine-learning-practice principles and RWE guidance provide useful methodological benchmarks rather than locally automatic approvals [7,13].

Monitoring after implementation is essential because vaccination can change the class balance and referral yield over time. Calibration and subgroup sensitivity may drift even if the software code is unchanged. External audits should be empowered to review false-negative pathways, algorithm errors and inappropriate follow-up recommendations. The programme should retain simple fallback workflows when an AI component fails, since digital sophistication should never become a single point of failure in a preventive service.

3.29 Interpretation of evidence and future research agenda

Future work should prioritize external prospective comparisons of validated HPV platforms; triage strategies that minimize overtreatment; specimen logistics for self-

collection; pathway designs that reduce loss to follow-up; and risk models robust to changing vaccine-era prevalence. Research teams need to distinguish a biomarker-discovery question from an implementation question. In the former, the primary concern may be independent discrimination of CIN3+; in the latter, an intervention may be valuable primarily because more eligible women complete a previously inaccessible screening pathway.

Reporting should include preplanned subgroup evaluations, uncertainty estimates and explicit handling of incomplete verification. Equally important are studies comparing basic reminder systems with elaborate AI systems, since complexity is not equivalent to clinical benefit. Linking a validated molecular diagnostic, a transparent triage algorithm and an auditable treatment pathway presents the most defensible route to cervical cancer prevention that is both effective and equitable.

3.30 Clinical integration and audit-ready implementation scenarios

Scenario A concerns a woman eligible for first-round HPV screening who has never undergone cytology. The clinician first confirms the nationally applicable age and risk criteria, explains that HPV is common and does not automatically indicate cancer, and offers a validated assay with an approved specimen type. If the result is negative and the sample is valid, the system schedules the guideline-consistent return interval. If positive, the report should provide enough genotype or reflex-test information to determine subsequent care under the selected local algorithm. A laboratory message without a completed patient notification cannot be counted as clinical closure. Quality indicators include result turnaround time, missing or rejected specimen rates and the proportion of screening-positive women completing the recommended next step.

Scenario B concerns a woman who has an HPV16-positive result. In the setting of applicable ASCCP guidance, this can trigger colposcopic assessment rather than simply repeating an HPV test [5]. The programme records the actual appointment completion and histological endpoint instead of inferring disease severity from viral positivity. If colposcopy is delayed, a patient-navigation mechanism should identify the barrier and assist with access. The process also preserves individual autonomy and confidential communication. A management algorithm embedded in software must clearly disclose the jurisdiction, publication version and exclusion populations for which its recommendations do not apply. Clinical documentation should retain the rationale for exceptions.

Scenario C involves an individual declining speculum-based sampling because of pain, disability-related access barriers or prior distress. Where a specific validated self-collection assay is available and allowed by local rules, this alternative may enable participation. Staff must explain appropriate specimen handling and what a positive result could entail. Self-collection should not be represented as equivalent to a complete pelvic examination for symptomatic patients or as suitable for every molecular platform. The performance audit should evaluate not just the number of kits distributed but completed testing, invalid sample rate and attendance after a positive result. Patient satisfaction outcomes should be measured alongside clinical endpoints.

Scenario D concerns a previously treated CIN2+ patient entering surveillance. The patient's risk differs from that of an individual at first screening, and recall logic must incorporate previous pathology and treatment rather than relying on the most recent HPV result alone. ASCCP updates through 2023 clarify surveillance following treatment [9]. Reliable longitudinal records are particularly important when patients move between districts. Fragmented laboratory and pathology systems can cause unnecessary repeat investigations or missed intensified surveillance. Such errors are not evidence of the failure of molecular biology; they are preventable health-system weaknesses requiring targeted interoperability solutions.

These scenarios highlight a shared design principle: automated workflows should implement rules transparently and recognize when cases require human review. Programme leaders should review adverse process outcomes including loss of specimens, incorrect result routing, referral delays, incomplete treatment and incorrect surveillance intervals. Clinical quality committees could sample cases for manual verification, identify error mechanisms and publish de-identified findings. Any deployment of predictive AI should demonstrate incremental improvement over deterministic reminders. A system that labels patients high risk without providing access to timely diagnosis may increase anxiety without achieving prevention.

A nationally tailored monitoring framework could distinguish structure indicators (accredited laboratory capacity, trained readers, secure registries), process indicators (invitation reach, valid test rate, turnaround time, triage completion) and outcome indicators (CIN3+ detection among those appropriately verified, interval cancer, invasive stage distribution and treatment-related complications). Composite indices should not conceal poor performance on an essential step. Stratification is required

to show whether national improvements are equitably distributed. A well-designed baseline evaluation is essential, because projected benefits cannot honestly be reported as already observed in the absence of local measurements.

A final methodological concern is the difference between screening test verification and causal effects on cancer outcomes. CIN3+ ascertainment requires diagnostic procedures, so disease status will often be unknown among screen-negative women. Estimates of sensitivity from fully verified referral cohorts therefore cannot automatically describe asymptomatic population screening. Longitudinal linkage to cancer registries helps identify interval cancers, but does not fully remove verification bias. Analysts should report reference standard completeness and sensitivity analyses for plausible undetected disease. Intervention comparisons should also separate invitation, attendance, testing, interpretation and treatment as distinct processes. Their failure mechanisms differ and require different remedies.

A clinically mature programme should treat interpretability, follow-up completeness and fairness as co-primary dimensions of quality. Software teams may optimise a classifier using an internally held-out validation set, yet a district-wide programme may have different infection prevalence, staining practices, laboratory instruments and patient case mix. Transportability therefore needs evaluation both before adoption and continuously after rollout. Transparent procurement, laboratory accreditation and accessible clinical escalation can deliver meaningful safety benefits even before AI is considered. Every proposed system change should specify its measurable outcome, responsible professional and predefined review date.

Finally, scientific reporting must separate achieved empirical measurements from planned service improvements. Estimates derived from WHO or randomized studies may establish an evidence-informed rationale, but cannot be relabelled as observed national coverage or local effectiveness. Formal implementation research should register its protocol, predefine a primary outcome, describe missingness and provide audit trails for all derived variables. Public-health impact should be evaluated over sufficient follow-up to distinguish temporary increases in precancer detection from subsequent reductions in invasive cancer. This distinction is essential for honest interpretation of cervical cancer elimination progress.

4. Discussion

The strongest interpretation of the available evidence is that a validated HPV-based programme offers a biologically coherent and clinically effective strategy, but tests and programmes operate at different levels. The central translational challenge is integration: an assay with excellent technical performance can coexist with weak overall effectiveness if specimen transport, result notification, colposcopy scheduling or definitive treatment is unreliable. Thus programme-level evaluations should measure a linked screening cascade rather than a single cross-sectional diagnostic indicator.

Risk-based management is a response to the heterogeneity of HPV infection. A positive HPV16 result, an HPV-positive result accompanied by transforming cytology, and a low-risk genotype constellation do not imply identical probabilities of CIN3+. ASCCP extended-genotyping recommendations and WHO triage guidance illustrate the movement from binary molecular screening toward stratified follow-up [4,5]. However, a published algorithm should not be transplanted without checking test regulatory status, population risk, local colposcopy access and the consequences of over-referral.

Methodological bias warrants particular attention. Verification bias emerges when biopsies are performed mainly after positive index tests; spectrum bias occurs when case-control datasets overrepresent advanced lesions; selection bias follows clinic-based recruitment; and incorporation bias arises when the index test affects the reference diagnosis. In observational comparisons, confounding by screening history, vaccine status and service access may remain after adjustment. Missing follow-up may not be random: people who live farther from facilities may both miss colposcopy and have worse late outcomes. Multiple imputation should be sensitivity-tested against plausible missing-not-at-random scenarios rather than treated as a universal solution.

A clinically interpretable AI model should report absolute predicted risk, uncertainty and the reasons a case was referred for review. Explainable AI techniques such as SHAP or saliency maps can aid debugging but do not prove causal explanations or patient safety. Ethical AI implies consent-appropriate data use, privacy-preserving linkage, performance audit across rural and urban service areas, clinician accountability and the ability to contest an automated recommendation. An AI tool that improves average sensitivity while disadvantaging a poorly represented language group or laboratory platform would not meet acceptable deployment standards [10].

FDA's evolving RWE guidance and AI-enabled device approaches underscore the need for intended-use clarity, robust dataset quality and lifecycle validation [7,13]. EMA's RWE policy and DARWIN EU are useful examples of multi-source regulatory science, but they do not validate an individual HPV assay in Uzbekistan [8]. WHO's 2021 AI guidance emphasizes human rights and responsible governance [10]. A trial or registry protocol should specify the oversight body, software change procedures and predefined escalation when sensitivity or calibration deteriorates.

The requested cross-disciplinary drug effectiveness examples provide methodological analogies but limited clinical relevance to a cervical-screening question. Antidiabetic therapy response prediction, cardiovascular survival modelling, oncology treatment heterogeneity, antimicrobial effectiveness and neurological disease management illustrate the importance of treatment selection and longitudinal follow-up. Yet these should not displace the primary prevention endpoints of CIN3+, interval cancer, adherence to evaluation and eventual mortality. Pharmacogenomics is promising across medicine but not a current replacement for genotype-informed viral screening.

For Uzbekistan, priority should be given to low-cost, measurable improvements: a standard laboratory dictionary, a unique referral identifier, routine follow-up alerts, quality audit of pathology and publicly reported performance metrics with appropriate privacy protection. Procurement decisions should distinguish assay availability from demonstrated service readiness. An incremental implementation study across diverse facilities can assess participant acceptability, out-of-pocket burden, result turnaround, clinician workload and retention without inventing a baseline national estimate. Integration of immunization and screening registries should proceed only with appropriate legal authorization and transparent governance.

This review has important limitations. It is not a registered systematic review; no exhaustive database counts or quantitative meta-analysis are claimed. The underlying materials include official recommendations, selected randomized data and observational syntheses with differing outcomes and years. Molecular adjuncts have uneven maturity; the absence of a listed pooled estimate is deliberate where comparable verified evidence is lacking. Clinical and policy recommendations must therefore be distinguished from hypothesized benefits or proposed future research.

5. Conclusion

HPV-based primary screening is a cornerstone of cervical cancer prevention, but sustainable benefit requires validated assays, risk-adapted triage, rapid linkage to colposcopy and precancer treatment, and longitudinal follow-up. HPV16/18 and extended genotyping, p16/Ki-67 dual staining and appropriately validated self-collection can refine pathway performance when supported by local resources and quality controls. RWE can reveal participation disparities and implementation failures; causal claims demand appropriately specified designs and carefully documented data. AI may support interpretation and patient navigation, but should undergo external, prospective and subgroup validation. Uzbekistan would benefit from a phased, interoperable cervical-screening registry with transparent indicators and independent evaluation. No fabricated patient-level outcomes or original statistical analyses are presented in this review.

Declarations

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