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Optimization Of The Effect Of The Amount Of Iron Ions ($\text{Fe}^{3+}/\text{Fe}^{2+}$) In Angren Kaolin On The Synthesis And Crystallization Process Of A-Type Zeolite (Zeolite A)

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Abstract

In this study, methods for reducing iron ($\text{Fe}^{3+}/\text{Fe}^{2+}$) compounds in Angren kaolin were studied. The initial sample contained 1.32% Fe_2O_3 . As a result of magnetic separation, acidic and thermal-chemical treatment, the Fe_2O_3 content was reduced to 0.12%, and the degree of bleaching of kaolin exceeded 80%. The obtained purified kaolin was found to be a promising raw material for the production of zeolites, adsorbents and ceramic products.

Keywords; Angren kaolin, kaolinite, aluminosilicate, SiO_2 , Al_2O_3 , Fe_2O_3 , $\text{Fe}^{3+}/\text{Fe}^{2+}$ ions, goethite, oxalate, EDTA, complex ions, deironization, magnetic separation, thermal-chemical method, bleaching, Zeolite A.

Annotatsiya. Ushbu tadqiqotda Angren kaolini tarkibidagi temir ($\text{Fe}^{3+}/\text{Fe}^{2+}$) birikmalarini kamaytirish usullari o'rganildi. Dastlabki namunada Fe_2O_3 miqdori 1,32 % ni tashkil etdi. Magnit ajratish, kislotali va termal-kimyoviy ishlov berish natijasida Fe_2O_3 miqdori 0,12 % gacha kamaytirildi hamda kaolinning oqartirish darajasi 80 % dan oshdi. Olingan tozalangan kaolin seolitlar, adsorbentlar va keramika mahsulotlari ishlab chiqarish uchun istiqbolli xomashyo ekanligi aniqlandi.

Kalit so'zlar. Angren kaolini, kaolinit, aluminosilikat, SiO_2 , Al_2O_3 , Fe_2O_3 , $\text{Fe}^{3+}/\text{Fe}^{2+}$ ionlari, goetit, oksalat, EDTA, kompleks ionlar, deironizatsiya, magnit ajratish, termik-kimyoviy usul, oqartirish, Zeolit A.

Hozirgi kunda mahalliy mineral xomashyolardan samarali foydalanish va ular asosida yuqori qo'shimcha qiymatga ega mahsulotlar ishlab chiqarish ilmiy hamda sanoat nuqtai nazaridan muhim ahamiyat kasb etmoqda. Bunday xomashyolar orasida kaolin o'zining aluminosilikat tabiati, yuqori kimyoviy barqarorligi va keng qo'llanilish sohalari bilan alohida o'rin egallaydi. Kaolin keramika, qog'oz, bo'yoq, rezina, farmatsevtika va kimyo sanoatida muhim xomashyo sifatida qo'llanilishi bilan bir qatorda, zeolitlar, adsorbentlar va katalizator tashuvchilarini sintez qilish uchun ham istiqbolli manba hisoblanadi [1].

O'zbekistonning yirik kaolin konlaridan biri bo'lgan Angren koni respublikaning muhim aluminosilikat xomashyo bazasini tashkil etadi. Angren kaolini asosan kaolinit mineralidan iborat bo'lib, uning tarkibida SiO_2 va Al_2O_3 asosiy komponentlar sifatida mavjud. Shu bilan birga, tabiiy kaolin tarkibida temir oksidlari ham uchraydi. Temir birikmalari kaolinning rang ko'rsatkichlari, kimyoviy faolligi va texnologik xossalari salbiy ta'sir ko'rsatib, undan yuqori sifatli mahsulotlar olish imkoniyatlarini cheklaydi [2].

Ma'lumotlarga ko'ra, Angren kaolini tarkibida Al_2O_3 miqdori 28–32 %, SiO_2 miqdori esa 48–52 % oralig'ida bo'lib, Fe_2O_3 miqdori 0,7–1,4 % gacha yetadi. Temir oksidlarining mavjudligi kaolinning oqlik darajasini pasaytiradi hamda undan yuqori tozalikdagi zeolit A va adsorbentlar sintezida foydalanish samaradorligini kamaytiradi [3]. Shu sababli kaolinni deironizatsiyalash, ya'ni temir birikmalarini ajratib olish va ularning miqdorini minimallashtirish muhim ilmiy-amaliy vazifa hisoblanadi [4].

Mazkur tadqiqotning maqsadi Angren kaolini tarkibidagi temir birikmalarini kamaytirishning samarali usullarini o'rganish, tozalash jarayonining mineral tarkibga ta'sirini baholash hamda olingan mahsulotning zeolit sintezi uchun yaroqliligini aniqlashdan iborat. Tadqiqot natijalari mahalliy xomashyoni chuqur qayta ishlash texnologiyalarini takomillashtirish va import o'rnini

bosuvchi yuqori sifatli alumosilikat materiallar ishlab chiqarishni rivojlantirishga xizmat qiladi [5].

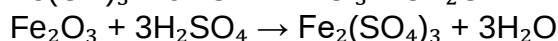
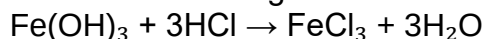
Angren kaolining asosiy mineral tarkibini kaolinit ($\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$), kvars, illit va gidromika tashkil etadi. Shuningdek, uning tarkibida goetit (FeOOH), gidrogetit hamda $\text{Fe}^{2+}/\text{Fe}^{3+}$ ionlari ko'rinishidagi temir birikmalari mavjud. Ushbu aralashmalar kaolinning oqlik darajasini pasaytirib, keramika, qog'oz sanoati va zeolit sintezi uchun qo'llanilishini cheklaydi.

Kaolindagi temirni kamaytirishning asosiy usullari magnit separatsiya, kislotali yuvish va qaytaruvchi reagentlar bilan ishlov berishdan iborat. Magnit separatsiya yordamida temirli minerallar ajratib olinadi, H_2SO_4 va HCl kabi kislotalar esa temir ionlarini eritmaga o'tkazadi [6]. $\text{Na}_2\text{S}_2\text{O}_4$ bilan ishlov berish Fe^{3+} ionlarini Fe^{2+} holatiga qaytarib, ularning ajralishini osonlashtiradi [7]. Oksalat, sitrat va EDTA kabi kompleks hosil qiluvchi reagentlar temir ionlarining eritmada barqaror saqlanishini ta'minlaydi [8].

Tadqiqotlar natijasiga ko'ra, magnit separatsiya va kimyoviy yuvish usullarini birgalikda qo'llash Fe_2O_3 miqdorini 85–90 % gacha kamaytirish imkonini beradi [9]. Shu sababli ushbu usullar Angren kaolinitini zeolit A sintezi uchun tayyorlashda eng samarali texnologik yondashuvlardan biri hisoblanadi [10].

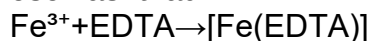
Kimyoviy tozalash usullari kaolin tarkibidagi temir birikmalarini mineral yuzasi va kristall panjarasidan eritmaga o'tkazish orqali ajratishga asoslanadi. Bu jarayonda HCl va H_2SO_4 kabi mineral kislotalar temir oksidlarini eruvchan ionlar holatiga o'tkazib, kaolinning oqlik darajasini oshiradi. Oksalat, sitrat va EDTA kabi kompleks hosil qiluvchi reagentlar temir ionlari bilan barqaror komplekslar hosil qilib, ularning ajralishini kuchaytiradi. Shuningdek, $\text{Na}_2\text{S}_2\text{O}_4$ kabi qaytaruvchi moddalar Fe^{3+} ionlarini Fe^{2+} ga aylantirib, temirning eritmaga o'tish jarayonini tezlashtiradi.

Tadqiqotlar natijasida kimyoviy yuvish usullari Fe_2O_3 miqdorini sezilarli darajada kamaytirishi aniqlangan. Jarayonning asosiy mexanizmi temir ionlarining qattiq fazadan suyuq fazaga o'tishi va hosil bo'lgan eruvchan birikmalarning eritmada chiqarilishiga asoslanadi.



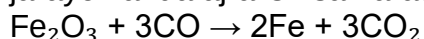
Kimyoviy ishlov berish jarayonida kislota eritmalarining konsentratsiyasi odatda 10–20 % dan oshmasligi va jarayon 80–95 °C haroratda taxminan 3 soat davomida olib borilishi maqsadga muvofiq hisoblanadi. Ushbu sharoitlarda kaolin tarkibidagi temir birikmalarining sezilarli qismi eritmaga o'tib, Fe miqdori 40–75 % gacha kamayishi mumkin.

Kaolinni organik komplekslovchi moddalar bilan tozalash jarayonida esa EDTA, oksalat va sitrat kabi ligandlar asosiy rol o'ynaydi. Ular temir ionlari bilan barqaror kompleks birikmalar hosil qilib, Fe ni mineral yuzasidan ajralishini va eritma fazasiga o'tishini sezilarli darajada osonlashtiradi.



Ushbu texnologik yondashuvda tozalangan kaolin zeolit sintezi uchun talab etiladigan yuqori kimyoviy tozalik darajasiga erishish imkonini beradi. Jarayon ekologik jihatdan nisbatan maqbul bo'lib, chiqindi reagentlarining mineral bilan mustahkam bog'lanmasligi va qaytaruvchilar hamda organik kompleks hosil qiluvchilarning past konsentratsiyalarda ham faollik ko'rsatishi tufayli atrof-muhitga tashlanadigan chiqindi miqdorini kamaytiradi.

Termik-kimyoviy ishlov bosqichida kaolin 500–700 °C oralig'ida kalsinatsiya qilinadi, bu esa temir va titan saqlovchi fazalarning kristall tuzilma va oksidlanish darajasi bo'yicha transformatsiyasiga sabab bo'ladi. Bunday harorat rejimi kaolinit qatlamlarining qisman dehidroksillanishiga olib kelib, aralashma oksidlarining metastabil yoki amorf holatga o'tishini tezlashtiradi. Natijada, Fe va Ti birikmalarining keyingi kimyoviy yuvish yoki fizik separatsiya jarayonlarida ajralish samaradorligi sezilarli ortadi.



Hosil bo'lgan Fe magnit ajratish orqali chiqariladi. Lekin bu usul titan uchun samarali emas.

Eng samarali gibrid tozalash yondashuvi HCl asosidagi gidrometallurgik yuvish va flotatsiya jarayonlarini ketma-ket qo'llashga asoslanadi bo'lib, bu usul temir saqllovchi fazalarni 70–85 % gacha kamaytirish imkonini beradi. Kaolin mineralogik xususiyatlari (genezisi, dispersligi, sirt zaryadi, qatlamlararo bog'lanish energiyasi hamda gematit va goetit kabi aksessor minerallar mavjudligi) tozalash jarayonini ko'p bosqichli va selektiv reagentlarga asoslangan texnologiya sifatida loyihalashni talab etadi. Angren kaolini uchun optimal sxema quyidagi ketma-ketlikda amalga oshiriladi: (1) mexanik maydalash va $\leq 74 \mu\text{m}$ fraksiyalash; (2) past intensivlikdagi magnit separatsiya orqali temirli minerallarning qo'pol fraksiyasini ajratish; (3) 10–15 % HCl eritmasida 80–90 °C da 2 soat kislota yuvish orqali Fe-oksidlar va izomorf temirni eritmaga o'tkazish; (4) yuvish, filtratsiya va quritish bosqichlari. Natijada kaolin tarkibidagi Fe_2O_3 miqdori sezilarli kamayib, xomashyo yuqori oqlikka ega, zeolit sintezi hamda funksional mineral materiallar olish uchun yaroqli tozalangan alumosilikat prekursoriga aylanadi.

O'tkazilgan tadqiqotlar Angren kaolini tarkibidagi temir birikmalarini kamaytirish uning sifat ko'rsatkichlarini sezilarli darajada yaxshilashini ko'rsatdi. Dastlabki namunada Fe_2O_3 miqdori 1,32 % ni tashkil etib, bu ko'rsatkich yuqori texnologik qo'llanmalar uchun yetarli emasligi aniqlandi. Mexanik fraksiyalash va magnit separatsiya temir birikmalarini qisman kamaytirgan bo'lsa-da, ularning samaradorligi cheklanganligi kuzatildi. Kimyoviy ishlov berish, xususan mineral va organik kislotalar hamda qaytaruvchi va kompleks hosil qiluvchi reagentlar qo'llanilganda temir ionlarining sezilarli darajada kamayishi ta'minlandi. Eng yuqori samaradorlik kombinatsiyalangan texnologiyalar — magnit separatsiya, kalsinatsiya va kimyoviy ishlov berish jarayonlarini ketma-ket qo'llash orqali erishildi. Natijada Fe_2O_3 miqdori 0,12 % gacha kamaydi, oqartirish darajasi esa 80 % dan oshdi. Olingan natijalar tozalangan Angren kaolinining keramika, qog'oz sanoati hamda zeolit va adsorbentlar sintezi uchun yuqori sifatli xomashyo sifatida istiqbolli ekanligini ko'rsatadi. Shu bilan birga, ushbu yondashuvlar mahalliy mineral resurslardan samarali foydalanish va import o'rnini bosuvchi texnologiyalarni rivojlantirish uchun ilmiy-amaliy asos bo'lib xizmat qiladi.

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Optimization Of The Content Of TiO_2 In Kaolin For Synthesis Of Zeolite A

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Abstract

This article studies effective methods for reducing titanium (IV) oxide in Angren kaolin. Their reduction allows obtaining highly purified kaolin for use in ceramics, whitening pigments, catalyst carriers, and zeolite synthesis.

Keywords: silicon oxide (SiO_2), aluminum oxide (Al_2O_3), titanium dioxide (TiO_2)

Annotatsiya

Ushbu maqolada Angren kaolini tarkibidagi titan (IV) oksidini kamaytirishning samarali usullari o'rganildi. Ularni kamaytirish keramikada, oqlovchi pigmentlar, katalizator tashuvchilari hamda seolit sintezi uchun yuqori tozalangan kaolin olish imkonini yaratadi.

Kalit so'zlar. kremniy oksidi (SiO_2), alyuminiy oksidi (Al_2O_3) titan dioksidi (TiO_2)

Bugungi kunda sanoat va ilm-fan sohalarida tabiiy mineral xomashyolardan samarali foydalanish muhim ahamiyat kasb etmoqda. Xususan, kaolin gil minerali o'zining kimyoviy tarkibi, fizik-kimyoviy xossalari va keng qo'llanilish sohasi bilan alohida e'tiborga loyiqdir. Kaolin keramika, qog'oz, bo'yoq, rezina, farmatsevtika, kosmetika hamda kimyo sanoatida muhim xomashyo hisoblanadi. Shu bilan birga, kaolin asosida seolitlar, katalizatorlar va adsorbentlar sintezi ham ilmiy-amaliy jihatdan dolzarb masalalardan biridir. O'zbekiston Respublikasi hududida kaolinning yirik konlaridan biri Angren kaolin koni hisoblanadi. Angren kaolini Toshkent viloyatining Angren sanoat hududida joylashgan bo'lib, respublikaning muhim mineral xomashyo bazasini tashkil etadi. Ushbu kaolin asosan kaolinit mineralidan iborat bo'lib, uning tarkibida kremniy oksidi (SiO_2) va alyuminiy oksidi (Al_2O_3) asosiy komponentlar sifatida uchraydi. Biroq tabiiy holatda Angren kaolini tarkibida ma'lum miqdorda itan dioksidi (TiO_2) mavjud bo'lib, ular kaolinning rangiga, reaktivligiga va sanoatdagi qo'llanish imkoniyatlariga salbiy ta'sir ko'rsatadi.

Kaolinni kimyoviy tozalash yondashuvlari kaolin tarkibidagi rang beruvchi aralashmalarni mineral yuzadan yoki kristall panjara qatlamlaridan ionlarni eritmaga o'tkazish orqali ajratishga tayanadi. Ushbu jarayonlarda eng ko'p qo'llaniladigan reagentlar bir necha funksional guruhlariga bo'linadi. Noorganik mineral kislotalar, xususan, xlorid va sulfat kislota eritmaları temir saqllovchi oksid fazalarini erkin ion holatiga o'tkazishda yuqori faollik namoyon etadi va shu orqali kaolin oqlik darajasining oshishiga xizmat qiladi. Karbon kislota asosli organik ligandlar (masalan, oksalat va sitrat ionlari) Ti markazlari bilan barqaror koordinatsion komplekslar hosil qilish qobiliyatiga ega bo'lib, ularning mineral sirtidan desorbsiya qilinishini kuchaytiradi.

Amaliy natijalar shuni ko'rsatadiki, kimyoviy yuvish jarayonlari TiO_2 fazasi yuqori kimyoviy inertligi sababli bunday sharoitlarda to'liq erimaydi. Shu sababli, titan birikmalarini chuqurroq kamaytirish odatda ketma-ket yoki kombinatsiyalangan qo'shimcha tozalash bosqichlarini (fotokimyoviy oksidlanish, ftorli erituvchilar, yoki fizik separatsiya) talab qiladi.

Kaolinni organik komplekslovchilar bilan tozalashda asosan sitrat kislotalari titanni kuchli kompleks shakliga o'tkazish orqali amalga oshiriladi.

$\text{Ti}^{4+} + \text{sitrat} \rightarrow \text{kompleks ionlar}$

Ushbu texnologik yondashuvda tozalangan kaolin zeolit sintezi uchun talab etiladigan yuqori kimyoviy tozalik darajasiga erishish imkonini beradi. Jarayon ekologik jihatdan nisbatan maqbul bo'lib, chiqindi reagentlarining mineral bilan mustahkam bog'lanmasligi va

qaytaruvchilar hamda organik kompleks hosil qiluvchilarning past konsentratsiyalarda ham faollik ko'rsatishi tufayli atrof-muhitga tashlanaddigan chiqindi miqdorini kamaytiradi.

Termik-kimyoviy ishlov bosqichida kaolin 500–700 °C oralig'ida kalsinatsiya qilinadi, bu esa titan saqlovchi fazalarning kristall tuzilma va oksidlanish darajasi bo'yicha transformatsiyasiga sabab bo'ladi. Bunday harorat rejimi kaolinit qatlamlarining qisman degidroksillanishiga olib kelib, aralashma oksidlarining metastabil yoki amorf holatga o'tishini tezlashtiradi.

Eng samarali gibrid tozalash sxemalaridan biri HCl bilan gidrometallurgik yuvish va flotatsiya jarayonlarining ketma-ket kombinatsiyasi bo'lib, bu yondashuv temir va titan saqlovchi fazalarni 70–85% gacha kamaytirish imkoniyatiga ega. Kaolin mineralining genezisi, disperslik darajasi, qatlamlararo ionlarning bog'lanish energiyasi hamda aksessor minerallar (gematit, ilmenit, rutil, anatase) mavjudligi tozalash texnologiyasini ko'p bosqichli va selektiv reagentlar ishtirokiga asoslangan holda loyihalashni talab etadi.

Angren kaolini uchun tavsiya etiladigan optimal tozalash strategiyasi mineralning strukturaviy barqarorligi, sirt zaryadi xususiyatlari, donachalar morfologiyasi va izomorf aralashmalar spektri hisobga olingan holda shakllantiriladi.

Suspenziya tozalashdan keyingi yuvish, qattiq-suyuqlik fazalarini ajratish (filtratsiya) va termik quritish jarayonlaridan o'tkaziladi. Jarayonning umumiy samaradorligi natijasida kaolin mahsulotida TiO_2 0.1–0.2% gacha pasayishi mumkin, bu esa xomashyoning oqlik darajasini sezilarli oshiradi va uni zeolit sintezi, yuqori sifatli keramika hamda funksional mineral to'ldirgichlar olish uchun yuqori poklikdagi prekursor materialiga aylantiradi.

O'tkazilgan tadqiqotlar Angren kaolini tarkibidagi titan birikmalarini kamaytirish kaolinning sifat ko'rsatkichlarini sezilarli darajada yaxshilashini ko'rsatdi. Dastlabki kaolin namunasida TiO_2 miqdori 0,9% ni tashkil etib, bu ko'rsatkichlar yuqori texnologik jarayonlar uchun yetarli emasligi aniqlandi.

Shu bilan birga, olingan natijalar mahalliy mineral resurslardan samarali foydalanish, import o'rnini bosuvchi mahsulotlar ishlab chiqarish va iqtisodiy jihatdan samarali texnologiyalarni joriy etish uchun ilmiy-amaliy asos bo'lib xizmat qiladi.

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The Role And Significance Of Uzbekistan's Most Historical Science In The Development Of Historical Thought

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Tarixiy ta'lim ko'p yillar davomida insonning ma'naviy qiyofasini shakllantirishda, shaxsni tarbiyalashda yetakchi o'rinni egallab keladi. O'tmish, bugun va kelajak haqidagi savollarga javob beradi, insonni yashashga, fikrlashga, oldingi ajdodlar tajribasidan foydalanishga o'rgatadi. Hozirgi bosqichda tarix fanini o'qitishning optimal modelini isloh qilish va izlash yo'lidan borilmoqda. Uning mazmuni tarix ta'limining asosiy yo'nalishlarini belgilab beruvchi tarixiy-madaniy me'yorlarga asoslanadi va o'qituvchilarni yanada faolroq bo'lishga yo'naltiradi. O'quv-tarbiya ishlari samaradorligini oshirib borish har doim xalq, maorifi xodimlarining eng muhim vazifalaridan bo'lib kelgan. Chunki, har qanday jamiyatda ham yosh avlodni davr talabi darajasida tarbiyalab voyaga yetkazishda ularga beriladigan ta'lim-tarbiyaning roli deyarli hayotiy ahamiyat kasb etgan. Tarix kursini o'qitishda o'quvchilarning fikrlashga asoslangan malaka va ko'nikmalarini hosil qila borish vaziflari – bu tarixiy bilimlarni mustaqil sur'atda topib, bir tizimga solib, ularni amalda tadbiq eta bilishga o'rgatish, pirovardida esa o'quvchilarni o'tmishdagi hamda hozirgi zamondagi ijtimoiy hodisalarga nisbatan ilmiy materialistik nuqtai nazardan yondashishga o'rganish demakdir. Nutqni o'stira borish ham o'quvchilarning va ularda aqliy mehnat malakalari hamda ko'nikmalarini hosil qila borish bilan bog'langandir¹.

Biz ta'lim muassasasida o'qitiladigan tarixning o'ziga xos xususiyatlarini hisobga olgan holda, tarix kursini o'qitish davomida hosil qilina boradigan malakalar guruhlarini shartli ravishda ajratib ko'satamiz. 1. Tarixiy bilim beruvchi manbalarni tahlil qilish hamda tarixiy voqealar va hodisalardagi eng asosiy va muhim narsani, ularning muhim belgilari va bog'lanishlarini ajratib chiqish, tarixiy tushunchalarga ta'riflar berish malakalari. 2. Tarixiy bilim beruvchi manba mazmunini mantiqiy jihatdan bir necha qismga ajratish, umumiy mantiqiy sxemasini bir turdagi tarixiy hodisalar hamda voqealarni tahlil qilishda deduktiv suratda tadbiq etish malakalari. 3. Tarixiy dalillar va jarayonlarni o'z doirasida qarab chiqish hamda vaqt jihatdan ular o'rtasidagi nisbatni aniqlash xronologik va sinxronistik jadvallar tuzish malakalari. 4. Tarixiy hodisalarning joyini aniqlash, tarixiy xaritani "tilga kirgizish", undagi izohlar va shartli belgilardan xatosiz foydalanish, yozuvsiz xaritani tarixiy mazmunda to'ldirish malakalari. 5. Tarixiy voqealar, hodisalarni taqqoslash, ularning umumiy xususiyatlarini topish malakalari; 6. Tarixiy dalillarni tahlil qilish va taqqoslash asosida induktiv va deduktiv xulosalar chiqarish usulidan foydalangan holda yakunlar yasash, yakunlarni berilgan baholarini asoslab berish, taxiriy dalillar umumiy xulosalarga tayangan holda to'g'ri isbotlay olish malakalari; 7. Tarixiy materiallarni og'zaki yoki yozma tarzda bayon eta bilish, izchil tarzda obrazli qilib bayon etishning turlaridan hikoya qilish, tasvirlash, usullaridan foydalana bilish, savollarga qisqa atroflicha javob berish, hamda o'z o'rtoqlariga savollar berish, ularning javoblarni tanqidiy nuqtai nazardan baho berish malakalari; 8. Axborotlar, dokladlar, referatlar, siyosiy axborotlar tayyorlash, hamda ularni o'tkazish, kichikroq hajmdagi ilmiy – ommabop materiallarni tayyorlash malakalari; 9. Tarixiy matn mazmunini yoki o'qituvchi hikoyasini rejasini, tarixiy voqea yoki hodisani tahlil qilish rejasini, taqqoslash rejasini tuzish, reja, ishlanma, tezislar tuzish, o'qituvchi tushuntirib bergan asosiy qoidalarni qisqacha yozib borish, kitoblardan ayrim joylarini yozib olish, ma'lumotlar beruvchi tarixiy adabiyotlardan foydalana bilish malakalari².

¹ Шаякубов Ш.Ш. Ўзбекистон тарихини ўрганиш ва ўқитишнинг долзарб масалалари // <https://el.tti.uz/>. 2017.

² Ўзбекистонда тарих фани: муаммолар ва ривожланиш истиқболлари. Тарихшунослик ўқишлари-2017: конференция материаллари. – Тошкент: Akademnashr, 2018. – В. 74.

O'quvchilar tafakkuri va nutqining o'sa borishi, malaka va ko'nikmalarning hosil bo'la borishi, bilimlarni egallash va ularni tadbiiq etish, ular bilan ish olib borish jarayonida yuz beradi. Bilimlar bilan malakalar o'rtasida o'zaro bog'lanish va bir – biriga bog'liqlik bor. Kishi aqliy faoliyatning onglik xarakteri unda hosil bo'lgan bilimlar tizimi bilan belgilanadi. Bilim hamma vaqt tegishli malaka va ko'nikmalar tizimiga tayanadi. O'z navbatida yangi malaka va ko'nikmalar vujudga kelishi uchun zamin hisoblanadi³.

O'qitish jarayonining har qaysi bosqichida bilimlar, malaka va ko'nikmalar o'rtasidagi o'zaro nisbat o'quvchining aqliy jihatdan yetuklik darajasini ham belgilaydi. O'quvchilarning malaka va ko'nikmalarini hosil qila borishga qaratilgan ishning muvaffaqiyatli chiqishi ko'pgina shart – sharoitlarga bog'liq. Tarix o'qituvchisi birinchi navbatda u yoki bu sinfda bundan ilgari hosil qilingan bilim va malakalarning qanday doiraga tayana olish mumkinligini, ayrim o'quvchilarda qanday malaka yaxshi hosil bo'lmaganligi yoki yo'qligini aniqlab olishi zarur. Ana shu asosda o'quvchilarni turli guruhlarga hamda ayrim o'quvchilarga nisbatan bundan keyin differensial yo'sinda yondashishga o'tiladi. O'qituvchi ish jarayonida o'quvchilarning bilim va malakalar hosil qilishda qanday darajada ekanliklarini doim tekshirib va hisobga olib boradi. Hosil qilingan malaka o'qituvchilarning o'zlariga tanish turdagi yangi sharoitlar, yangi o'quv materiallari asosida mustaqil suratda bajara olish, ya'ni o'quv vazifasini bajarishda tashabbus ko'rsatib yangi sharoitlarda tadbiiq eta olish vazifalarini hal etishning yangi usullarini topa bilish qobiliyati demakdir⁴.

Aqliy faoliyatning muayyan usullarini egallab olish malakalar hosil qilishning asosini tashkil etadi. Malaka egallab tadbiiq etishda qanchalik mustaqil ish tutishi hamda usulda tadbiiq etiladigan hodisalar doirasining qanchalik kengligi bilan belgilanadi. Aqliy faoliyatning muayyan usullarini egallab olish malakalar hosil qilishning asosini tashkil etadi. O'quvchilar bironta malakani, masalan, tarixiy hodisalarni taqqoslash, isbotlab berish malakasini hosil qilmoq uchun o'qituvchiga o'sha mantiqiy vazifaning maqsad va mohiyatini, hamda uni bajarish usullarini tushuntirib, ularni aniq tarixiy materialga tadbiiq etgan holda ko'rsatib beradi. Ko'rsatib berish paytida mazmuni uncha murakkab bo'lmagan material: taqqoslash uchun – moddiy madaniyatga doir ikki narsa, xulosa chiqarish uchun – darslikning bir necha rejasidan iborat matn va shu singari tanlangani ma'qul⁵.

Shundan keyin o'qituvchilar qanday ishlash usullarini ko'rsatib berilgan materialga o'xshash tarixiy materiallar va mantiqiy materiallar bilan ish olib borishni o'qituvchi rahbarligida endi o'zlari bajaradilar. O'qituvchilar bu usullarni qadam – ba qadam o'zlari bajaradigan bo'ladilar. Dastlab bu ishni yaxshi o'quvchiga topshirish yoki shu ishni izchil suratda pog'onama – pog'ona bajarishga butun sinfni jalb etib, uni evristik usulda o'tkazish mumkin. Keyinchalik o'qituvchi o'quvchilarni bunday usullarni shunga o'xshash materialga tadbiiq etgan holda, ularni yagona sharoitlarda qo'llay olishga ham o'rgatadi.

Usullarni yangi sharoitlarda qo'llash o'qituvchilar tomonidan avvalgi o'qituvchi rahbarligida jamoa bo'lib ishlash jarayonida, masalan evristik usuldagi suhbat davomida amalga oshiriladi. O'quvchilar usulni egallay borgan sari, ular mantiqiy vazifani tobora mustaqil va aniq bajara oladilar. Ular o'qituvchining harakatini endi shunchaki takrorlamaydilar, balki mantiqiy vazifaning maqsadi va ularning oldiga o'quv vazifasining shartlariga qarab, o'zlashtirilgan usullarga tayangan holda ish olib boradilar. Foydalanadigan usullar soni asta – sekin ko'paya boradi, shu bilan birga tobora ko'proq to'planib borgan bilimlardan foydalaniladi⁶.

³ Шаякубов Ш.Ш. Ўзбекистон тарихини ўрганиш ва ўқитишнинг долзарб масалалари // <https://el.tti.uz/>. 2017.

⁴ Маҳкамов С.Т. Тарих таълимида курслараро узвийликни таъминлашнинг дидактик асослари (7-синф тарих курслари мисолида). Педагогика фан ном. диссер. – Тошкент, 2005. – В. 57.

⁵ Tarix o'qitish metodikasi. – Samarqand. SamDU, nashri. 2019. – В. 37.

⁶ Ўзбекистонда тарих фани: муаммолар ва ривожланиш истиқболлари. Тарихшунослик ўқишлари-2017: конференция материаллари. – Тошкент: Akademnashr, 2018. – В. 75.

O'zbekiston tarixini o'qitishda o'quvchilarning fikrlashga asoslangan malaka va ko'nikmalarni hosil qila borish vazifalari bu tarixiy bilimlarni mustaqil sur'atda topib bir tizimga solib ularni amalda tadbiq eta bilishga o'rgatish, pirovardida esa o'quvchilarni o'tmishdagi hamda hozirgi zamondagi ijtimoiy hodisalarga nisbatan ilmiy – materialistik nuqtai nazardan qarash demakdir. Nutqni o'rganish, o'stira borish hamda o'quvchilarning tafakkurini o'stira borish va ularda aqliy mehnat malakalari, hamda ko'nikmalarini hosil qila borish bilan bog'langandir. Nutq – odamlarning bir – birlarini tushunish vositasigina bo'lib qolmay balki, fikrni yuzaga chiqarish hamda o'stirishdir. Tarix kursini o'qitishda nutq bilimlar orttirishning eng asosiy vositalaridan bir sifatida maydonga chiqadi. O'quvchilar tarixiy dalillarni, ular o'rtasidagi bog'lanish va munosabatlarni, ularning umumiy va bir – biridan farq qiluvchi xususiyatlarini, tarixiy hodisalarni, tarixiy hodisalar va tarixiy shaxslarning xususiyatlarini ko'rsatmali o'quv qurollari bilan birgalikda so'z orqali bilib oladilar. O'quvchining nutqi, darslik matni, tarixiy hujjatlar, ilmiy ommabop va badiiy adabiyot asarlari o'quvchilarga bilim beradigan, so'z bilan ifodalangan eng muhim manbaalar bo'lish bilan birga ularning nutqini o'stirish vositalari ham hisoblanadi⁷.

O'quvchilar tafakkuri va nutqini o'sa borishi, malaka va ko'nikmalarning hosil bo'la borishi, bilimlarni egallash va ularni tadbiq etish, ular bilan ish olib borish jarayonida yuz beradi. Bu – bitta o'qitish jarayonining ikki tomonidir. Bilimlar bilan malakalar o'rtasida o'zaro bog'lanish va bir – biriga bog'liqlik bor. Kishi aqliy faoliyatning onglik xarakteri, unda hosil bo'lgan bilimlar tizimi bilan belgilanadi. Bilim hamma vaqt tegishli malaka va ko'nikmalar tizimiga tayanadi va o'z navbatida yangi malaka va ko'nikmalar vujudga kelishi uchun zamin hisoblanadi. O'qitish jarayonining har qaysi bosqichidagi bilimlar, malaka va ko'nikmalar o'rtasidagi o'zaro nisbat o'quvchining aqliy jihatdan yetuklik darajasini belgilaydi. O'quvchilarning malaka va ko'nikmalarini hosil qila borishga qaratilgan ishning muvaffaqiyatli chiqishi ko'pgina sharoitlarga bog'liq⁸.

Hosil bo'lgan malaka o'quvchilarning o'zlariga tanish turdagi vazifani yangi sharoitlarida, yangi o'quv materiali asosida mustaqil sur'atda bajara olish, ya'ni o'quv vazifasini bajarishda tashabbus ko'rsatib, yangi sharoitlarda malakani tadbiq eta olish vazifalarini hal etishning yangi usullarini topa bilish qobiliyati demakdir. Tarix o'qitish metodikasi tarix fani bilan qisman bog'langandir. Tarixiy materiallar tarix fani va o'quv predmeti bo'lgan tarix kursining metodologik asosini tashkil etadi. Tarix o'qish o'quvchilarga tarixiy voqelikni bilish yo'llari, tarixiy tadqiqotga o'xshab ketadi. O'quvchilar tarixni o'rganishda olimlar tomonidan ilmiy jihatdan tekshirib ko'rilgan va tahlil qilingan dalillar hamda ilmiy xulosalardan yangi dalillarni o'rganish uchun foydalanishlari mumkin. Biroq, o'quvchilarning tarixni o'rganishi ilmiy tekshirishdan farq qiladi⁹.

O'zbekiston tarixini o'qitish ta'lim muassasasida fanning muhim tarmog'i bo'lib, u o'zining mustaqil tekshirishlar predmetiga ega. Metodikaning nazariy qismini egallash tarix o'qitish jarayonini umumiy qonuniyatlarini bilib olishga va qonuniyatlardan yosh avlodga ta'lim berib borish ishini yanada takomillashtirish maqsadida foydalanishga yordam beradi. Tarix ta'limining mazmuni va sinf o'quvchilarining umumiy saviyasiga qarab bilishning umumiy qonuniyatlari turlicha namoyon bo'ladi. Tarixning har bir kursi, uning bo'limi va har bir mavzusi o'quvchilarning bilim olish, ko'nikma va malakalariga ega bo'lishi bu kamol topishida muhim bir bosqich bo'lib xizmat qiladi. Quyi va yuqori sinflarda tarix o'qitishda tarixiy voqeylikni bilishning umumiy qonuniyatlariga amal qiladi, bu qonuniyatlar ta'lim mazmuni metodlari, usullari va o'quv qo'llanmalari metodik tuzilishining rivojlanish qonuniyatidir¹⁰.

⁷ Ўзбекистонда тарих фани: муаммолар ва ривожланиш истиқболлари. Тарихшунослик ўқишлари-2017: конференция материаллари. – Тошкент: Akademnashr, 2018. – В. 76.

⁸ Сафаева Э. Ўзбекистон халқлари тарихини ўқитишда маҳаллий материаллардан фойдаланиш. – Т. 1993. – В. 43.

⁹ Шаякубов Ш.Ш. Ўзбекистон тарихини ўрганиш ва ўқитишнинг долзарб масалалари // <https://el.tti.uz/>. 2017.

¹⁰ Сафаева Э. Ўзбекистон халқлари тарихини ўқитишда маҳаллий материаллардан фойдаланиш. – Т. 1993. – В. 47.

O'zbekiston xalqlari tarixini o'rganish asosida o'quvchilar bu o'lka hududida qadimda bir necha o'nlab millat va elatlar yonma – yon yashab kelganligini, ular mahalliy va ajnabiy bosqinchilar zulimiga qarshi birgalikda kurash olib borganligini, o'zbeklar hamisha boshqa millat va xalqlarga alohida hurmat bildirganligi, xalqlar qardoshligi va do'stligini muqaddas deb ardoqlashganligini, o'zbek xalqining bu tabarruk an'anasi umuminsoniy qadriyatlariga bebaho hissa bo'lib qo'shilganligi, millatlararo munosabatlar keskinlashib turgan hozirgi paytda bu an'ananing hayotiyiligi va yana bir bor sinovdan o'tayotganligini anglab oladilar. Shuningdek, mustabid hukmdorlar va bosqinchilar hokimiyati yillarida xalqimizning moddiy – ma'naviy boyliklari va go'zal an'analari oyoq osti bo'lib toptalgani, shaxsga sig'inish va turg'unlik yillaridagi tanglik, paxta yakkaxokimligi, kimyoviy moddalarning haddan ko'p qo'llanilishi O'zbekistonning ijtimoiy – iqtisodiy, ma'naviy, siyosiy rivojlanishiga to'sqinlik qilganini, ekologik muhitdagi nomutanosibliklarga, Orol bo'yi fojeasiga, atrof – muhit, yer – suv va havoni ifloslanishiga olib kelganligini odamlarning sog'ligini emas, balki irsiyatiga ham ta'sir ko'rsatganligini o'quvchilar tushunib olishi, ularning hozirgi ekologik muammolarni hal qilishda respublikamizning ijtimoiy – iqtisodiy va siyosiy mustaqilligini mustahkamlaydi hamda faol ishtirok etishini ta'minlashda muhim ahamiyatga egadir.

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The Sociolinguistic Status of English in Modern Uzbekistan

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Abstract

This study examines the contemporary sociolinguistic status of the English language in modern Uzbekistan, focusing on its rapid evolution from a traditional foreign language to a vital tool for socioeconomic development, higher education, and global integration. Prompted by extensive state-led educational reforms and shifting youth demographics, English has carved out an unprecedented niche alongside Uzbek, the state language, and Russian, the historically dominant regional lingua franca. Through a comprehensive analysis of recent language policies, educational initiatives, and societal attitudes up to 2026, this article demonstrates how English serves as an instrument of prestige and globalization, reflecting Uzbekistan's broader modernization trajectory.

Keywords: Sociolinguistics, Language Policy, English in Uzbekistan, Linguistic Globalization, Multilingualism.

The sociolinguistic canvas of modern Uzbekistan is experiencing a profound reconfiguration, characterized by the rapid and systemic integration of the English language into the nation's communicative ecology. For decades following its independence in 1991, Uzbekistan navigated a complex bilingual landscape dominated by Uzbek, the constitutionally mandated state language, and Russian, which functioned as the de facto language of interethnic communication, bureaucracy, and urban life. However, as the country advanced into the mid-2020s, a dramatic paradigm shift became visible, driven by aggressive globalization, economic liberalization, and deliberate state intervention. English has moved swiftly from the peripheral status of a traditional foreign language taught abstractly in schoolrooms to a highly coveted linguistic commodity. This transition reflects Uzbekistan's broader strategic reorientation away from historical post-Soviet insularity toward active participation in the global marketplace. In 2026, the status of English can be understood not merely as an academic subject, but as a robust instrument of socioeconomic mobility and symbolic capital. It operates as a powerful catalyst for modernization, redefining societal notions of prestige, altering educational priorities, and reshaping the linguistic identities of the younger generation who see fluency as an essential attribute of global citizenship.

This sociolinguistic transformation is structurally anchored in a series of ambitious legislative frameworks and educational reforms designed to cultivate a multilingual populace capable of driving the nation's newly diversified economy. The government of Uzbekistan has implemented far-reaching policies that effectively mandate the integration of English into public administration, corporate sectors, and all tiers of the educational hierarchy. A pivotal mechanism in this process has been the institutionalization of standardized language proficiency tests, whereby advancements in higher education, admissions to prestigious domestic and international programs, and even promotions within certain civil service domains are explicitly tied to international benchmarks such as IELTS or the national CEFR-aligned equivalents. By 2025 and 2026, these policy mandates have triggered an unprecedented societal response, manifesting in an explosive proliferation of private language academies, popularly known as learning centers, across the country. These centers operate as crucial sociolinguistic micro-environments where non-formal language acquisition takes place, bridging the gap between formal state curricula and the immediate linguistic demands of the job market. This commercialized language industry underscores a widespread public

consensus: English proficiency is the single most valuable linguistic currency for bypassing traditional economic limitations and unlocking elite professional pathways.

The educational sector serves as the primary incubator for this linguistic shift, where English has increasingly assumed the role of a Medium of Instruction (EMI) rather than just a foreign language subject. This phenomenon is particularly pronounced within the higher education landscape, which has seen a massive influx of foreign branch universities alongside the establishment of progressive domestic institutions prioritizing English-taught programs. Institutions such as Westminster International University in Tashkent, Webster University, and New Uzbekistan University have established a new academic elite whose primary intellectual discourse occurs entirely in English. This systemic adoption of EMI has necessitated a fundamental overhaul of pedagogical methodologies, shifting the national paradigm from old grammar-translation models to communicative and task-based language teaching approaches. To systematically evaluate how English has penetrated different spheres of public and private life, it is useful to examine its distribution across various sociolinguistic domains. Table 1 provides a comprehensive overview of the functional status, level of penetration, and primary roles of English across key domains in modern Uzbekistan during the 2025–2026 period.

Table 1. Sociolinguistic Domains and the Functional Status of English in Uzbekistan (2025-2026)

Domain	Penetration Level	Primary Functional Role	Competing/Co-existing Languages
Higher Education	Very High	Medium of Instruction, research, international academic exchange	Uzbek, Russian
Secondary Education	Moderate-High	Mandatory curriculum subject, specialized language schools	Uzbek, Russian
Corporate & IT Sectors	High	Cross-border commerce, software development, corporate communication	Russian, Uzbek
Government & Diplomacy	Moderate	International relations, foreign investment attraction, state diplomacy	Uzbek (Official)
Media & Youth Culture	High	Social media interaction, entertainment consumption, code-switching	Uzbek, Russian

As systematically delineated in Table 1, the penetration of English is highly uneven yet strategically concentrated in domains that dictate the country's global connectivity and future human capital. In the domain of higher education, the "Very High" penetration status reflects a structural reality where academic survival and prestige are increasingly contingent upon English literacy. This domain demonstrates how English is actively displacing Russian as the preferred language of scientific inquiry and global academic networking, creating a generation of scholars whose research outputs are targeted at international indexed journals rather than regional publications. Conversely, in the domain of government and diplomacy, the status of English remains "Moderate" because the state language, Uzbek, rightfully maintains its constitutional hegemony in internal administration and legislative procedures. However, even within this traditionalist domain, English acts as an indispensable tool for economic diplomacy and foreign investment attraction, with young, foreign-trained specialists increasingly occupying analytical and advisory roles. The data in the table further reveals that while Uzbek holds political legitimacy and Russian retains everyday practical utility, English functions as the premier language of aspiration, innovation, and internationalized commerce, establishing a complex, trilingual matrix that defines contemporary urban life.

Beyond the formal confines of classroom walls and corporate boardrooms, the sociolinguistic status of English is deeply visible within the digital landscape and contemporary youth culture, where it serves as a primary marker of identity and cosmopolitan alignment. The widespread adoption of smartphones and high-speed internet across Uzbekistan has democratized access to global digital content, positioning platforms like Telegram, Instagram, and LinkedIn as critical spaces for informal language contact. Among urban youth, this digital immersion has given rise to sophisticated forms of linguistic hybridization, most notably code-switching and code-mixing between Uzbek, Russian, and English. English lexical items—particularly those related to technology, lifestyle, business, and popular culture—are seamlessly embedded into everyday conversational Uzbek, functioning as a linguistic shorthand that signals technological savvy, modern identity, and elite social status. This vernacularization of English indicates that the language is no longer perceived by the younger demographic as an alien, external code belonging exclusively to Anglo-American cultures; rather, it has been actively localized, appropriated, and refashioned into an expressive resource that reflects their dual realities as proud citizens of Uzbekistan and active participants in a hyper-connected global youth culture. Despite the overwhelmingly positive narratives surrounding globalization and linguistic empowerment, the rapid ascendancy of English has concurrently introduced significant socioeconomic fractures and sociolinguistic anxieties within modern Uzbek society. The most prominent of these challenges is the widening linguistic divide between major urban agglomerations, particularly the capital city of Tashkent, and the rural provincial regions. While urban centers boast a dense concentration of well-funded private international schools, native English-speaking expatriates, and high-tech corporate environments, rural educational institutions frequently struggle with acute systemic deficits, including a severe shortage of proficient English instructors and outdated instructional materials. Consequently, English proficiency is increasingly acting as an unintended mechanism of social stratification, potentially transforming into an exclusionary barrier that limits prestigious university access and lucrative career opportunities to the affluent urban elite who can afford auxiliary private tutoring. Furthermore, this intense linguistic shift has reignited critical debates among intellectuals and policymakers regarding cultural preservation and linguistic purism, with some factions expressing concern that the excessive valorization of English may lead to the neglect or marginalization of the Uzbek language in domains of high science, advanced technology, and philosophy, thereby complicating the state's efforts to foster a balanced and harmonious model of societal multilingualism.

Looking forward into the horizon beyond 2026, the sociolinguistic trajectory of English in Uzbekistan appears structurally secure, set to deepen its roots rather than recede. The language has successfully transitioned from a superficial policy preference into an essential structural component of the nation's long-term developmental blueprint, aligning with its goals of privatization, digital innovation, and regional leadership. While the Russian language will undoubtedly continue to maintain its pragmatic hold on day-to-day interethnic commerce and regional migration patterns for the foreseeable future, its symbolic monopoly over intellectual and professional prestige is steadily eroding in the face of the English expansion. The case of Uzbekistan offers a compelling, contemporary illustration of a post-Soviet state actively rewriting its sociolinguistic destiny through pragmatic, forward-looking language planning. By strategically elevating English, Uzbekistan is successfully navigating the delicate geopolitical and cultural currents of the twenty-first century, masterfully balancing the absolute necessity of global integration with the enduring mandate of national heritage preservation, thereby cementing a unique identity on both the regional and international stage.

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Green Economy in Uzbekistan Challenges and Opportunities for Sustainable Development

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Abstract

The transition to a green economy has become one of the strategic priorities of Uzbekistan's national development agenda. Growing environmental challenges, climate change, resource depletion, and increasing energy demand require the adoption of sustainable economic models. Uzbekistan has initiated comprehensive reforms aimed at improving energy efficiency, increasing the share of renewable energy sources, reducing greenhouse gas emissions, and promoting environmentally responsible economic growth. The country's Green Economy Transition Strategy for 2019–2030 serves as the principal framework for achieving these objectives. This study examines the current state of green economy development in Uzbekistan, analyzes major reforms and achievements, and identifies existing challenges and future opportunities. The findings indicate that renewable energy expansion, green investment, technological innovation, and international cooperation are essential factors for ensuring sustainable economic growth. The transition to a green economy is expected to enhance environmental sustainability, create new employment opportunities, improve energy security, and contribute to achieving the Sustainable Development Goals (SDGs).

Keywords: green economy, sustainable development, renewable energy, climate change, green growth, environmental sustainability, energy efficiency, green investment, Uzbekistan.

Introduction

The concept of a green economy has emerged as a global response to environmental degradation, climate change, and unsustainable patterns of economic development. According to international organizations, a green economy promotes economic growth while reducing environmental risks and improving social welfare. It emphasizes efficient resource utilization, renewable energy development, environmental protection, and sustainable production and consumption patterns.

For Uzbekistan, the transition to a green economy is particularly important due to challenges such as water scarcity, land degradation, climate vulnerability, and dependence on fossil fuels. Recognizing these challenges, the government has incorporated green growth principles into national development strategies and has undertaken significant reforms aimed at achieving sustainable economic development. The Strategy on the Transition of the Republic of Uzbekistan to a Green Economy for 2019–2030 serves as the foundation for these reforms. The strategy seeks to ensure stable economic growth, reduce greenhouse gas emissions, improve energy efficiency, and strengthen environmental sustainability.

Green Economy Policy Framework in Uzbekistan

Uzbekistan's green transformation is guided by several strategic documents, including the Green Economy Transition Strategy 2019–2030 and the Uzbekistan–2030 Development Strategy. These policy frameworks emphasize renewable energy expansion, sustainable industrial modernization, climate adaptation, green finance, and environmental protection. The government has established institutional mechanisms to coordinate green reforms and monitor their implementation.

Recent policy reforms demonstrate Uzbekistan's commitment to achieving long-term sustainability. The government has strengthened national targets related to renewable energy development, energy efficiency, and greenhouse gas reduction. International organizations such as the OECD, the World Bank, AIIB, and UN agencies actively support Uzbekistan's green transition through technical assistance, financing, and policy recommendations.

Renewable Energy Development

Renewable energy represents one of the most important pillars of Uzbekistan's green economy agenda. The country possesses considerable solar and wind energy potential due to its favorable geographical and climatic conditions. Large-scale solar and wind power projects have been launched across different regions of the country, attracting substantial foreign investment. According to recent government targets, Uzbekistan aims to increase the share of renewable energy significantly by 2030. The renewable energy target was increased from 25% to 40% of installed electricity-generation capacity, reflecting the government's growing commitment to sustainable energy development. The expansion of renewable energy infrastructure is expected to reduce dependence on natural gas, lower carbon emissions, improve energy security, and create new employment opportunities. Renewable energy projects also contribute to technological modernization and support the country's transition toward a low-carbon economy.

Economic and Environmental Benefits

The transition to a green economy offers numerous economic, social, and environmental benefits. First, green growth promotes efficient resource utilization, reducing production costs and increasing competitiveness. Second, renewable energy investments stimulate economic diversification and create jobs in emerging sectors. Third, sustainable practices contribute to environmental protection and climate resilience.

Green investment has become increasingly important for Uzbekistan's economic development. International financial institutions have emphasized the importance of sustainable finance, climate-friendly investments, and environmentally responsible business practices. Green investments can support infrastructure modernization, energy efficiency improvements, sustainable agriculture, and climate adaptation measures. Furthermore, the green economy contributes to achieving the United Nations Sustainable Development Goals by promoting inclusive growth, environmental sustainability, and social welfare. It supports poverty reduction, improves public health, and strengthens resilience to climate-related risks.

Challenges of Green Transition

Despite notable progress, Uzbekistan faces several challenges in implementing green economy reforms. One major challenge is the need for substantial financial resources to support large-scale renewable energy and environmental projects. Infrastructure modernization requires significant investment and advanced technologies.

Another challenge involves improving institutional capacity and strengthening environmental governance. Effective implementation of green policies requires coordination among government agencies, businesses, and civil society organizations. Public awareness and environmental education also play an important role in ensuring successful green transformation. Climate change further intensifies existing environmental problems, including water shortages and land degradation. Therefore, climate adaptation measures must accompany mitigation efforts to ensure long-term sustainability.

Future Prospects

The prospects of green economy development in Uzbekistan remain highly promising. The country's strategic location, abundant renewable energy resources, and commitment to sustainable reforms provide a strong foundation for green growth. The implementation of the Uzbekistan–2030 Strategy is expected to accelerate environmental modernization and improve the country's competitiveness in the global economy. Continued cooperation with international organizations and development partners will facilitate knowledge transfer,

investment mobilization, and technological innovation. Expanding green finance mechanisms, supporting research and innovation, and strengthening environmental education can further accelerate the transition toward a sustainable economy.

Conclusion

The transition to a green economy is becoming a key driver of sustainable development in Uzbekistan. Through strategic reforms, renewable energy expansion, and green investment initiatives, the country is making significant progress toward environmental sustainability and economic modernization. Although challenges related to financing, infrastructure, and institutional capacity remain, the opportunities associated with green growth substantially outweigh these obstacles. The successful implementation of green economy policies will contribute to economic diversification, environmental protection, energy security, and improved quality of life for future generations. Uzbekistan's experience demonstrates that sustainable development and economic growth can be pursued simultaneously through comprehensive green transformation strategies.

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- Ministry of Economy and Finance of Uzbekistan: <https://www.mf.uz>
- Development Strategy Center of Uzbekistan: <https://strategy.uz>

Borrowing and Language Change in Contemporary Uzbek

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Abstract

This study explores the multi-layered phenomena of lexical borrowing and subsequent language change within contemporary Uzbek sociolinguistic contexts. Driven by rapid globalization, digital acceleration, and socio-economic shifts between 2025 and 2026, the Uzbek language is undergoing substantial structural and lexical transformations. By analyzing a compiled mini-corpus of media text, online communication, and academic discourse, this paper examines how foreign elements—predominantly English IT, financial, and subcultural terms—are integrated into the native agglutinative framework. The findings indicate a significant shift from historical Russian-mediated borrowing toward direct anglicization. These loanwords undergo systematic phonological, morphological, and semantic adaptations, reshaping everyday communication norms among the younger generation.

Keywords: Lexical borrowing, Uzbek sociolinguistics, language change, adaptation models, morphological integration.

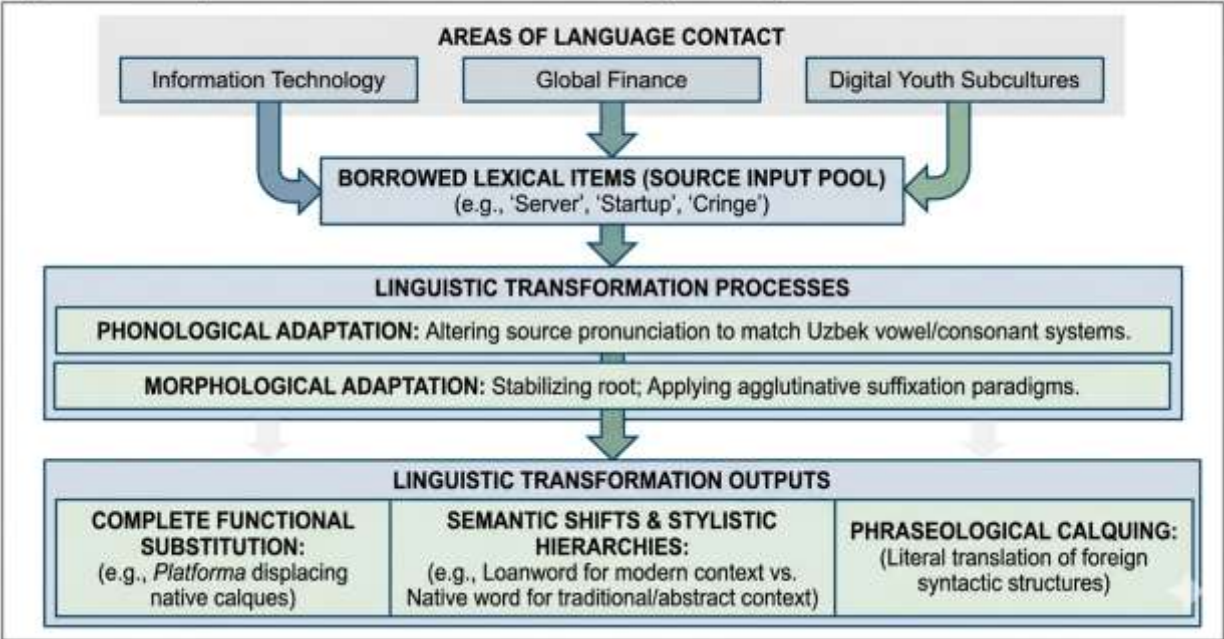
The contemporary sociolinguistic landscape of Uzbekistan offers a compelling paradigm for studying rapid language change driven by intensive cross-cultural contact, digital ubiquitousness, and socioeconomic modernization. As a prominent Turkic language characterized by an agglutinative morphological system, Uzbek has historically exhibited a high degree of structural flexibility and receptivity to external lexical influences. While historical strata of borrowing prominently feature Arabic and Persian layers due to deep-seated religious and literary traditions, followed by an extensive layer of Russian loanwords from the tsarist and Soviet administrative eras, the current epoch is marked by an unprecedented influx of direct internationalisms, primarily extracted from global English. This linguistic transition is not merely an isolated lexical expansion but rather an indicator of a profound structural shift in communicative practices, registers, and stylistic preferences within the speech community. As the nation deepens its integration into global economic frameworks, academic networks, and digital infrastructures between 2025 and 2026, the language reacts dynamically, accelerating structural adaptations that challenge traditional normative boundaries and generate hybrid linguistic varieties among native speakers.

Linguistic contact in the modern era is heavily accelerated by digital communication platforms, social media, and the globalization of specialized professional domains like information technology, finance, and youth subcultures. In examining these contemporary vectors, researchers observe that borrowing is no longer confined to luxury items or abstract concepts but serves as an immediate functional mechanism to bridge lexical gaps created by rapid technological advancements. Unlike the historical Russian-mediated borrowings, which were thoroughly filtered through the phonological and orthographic systems of the source administrative language before arriving in Uzbek, contemporary English borrowings penetrate the language directly via digital media, online education, and direct commercial channels. This direct contact bypasses conventional lexicographic gatekeeping, resulting in an immediate vernacularization of international terms. Consequently, the native speech community, particularly the urban youth and technical professionals, displays a high level of code-mixing and rapid morphological assimilation of these new tokens into daily discourse, thereby restructuring the internal lexical frequency distribution of the modern Uzbek lexicon.

The structural integration of these contemporary loanwords follows predictable yet highly dynamic phonological and morphological pathways determined by the typological nature of the

Uzbek language. Being an agglutinative language, Uzbek processes incoming loanwords by treating the borrowed root as a fixed semantic base to which native inflectional and derivational suffixes are sequentially appended. For instance, incoming English nouns are immediately subjected to Uzbek pluralization, case marking, and possessive paradigms without altering the internal structure of the borrowed root itself. This morphosyntactic resilience allows the language to absorb a vast volume of foreign terminology while strictly maintaining its core grammatical architecture. However, the sheer volume of these direct borrowings introduces subtle shifts in phonotactic constraints and orthographic representations, prompting ongoing debates among lexicographers and language planners regarding the standardization of spelling rules, pronunciation variants, and the preservation of native semantic equivalents in official and educational discourses.

Figure 1: Conceptual Framework of Lexical Borrowing and Linguistic Transformation Mechanisms



To systematically categorize and assess the distribution of these emerging lexical items across dominant socio-communicative domains, a semantic and structural classification is presented below. This classification reflects empirical data gathered from contemporary Uzbek digital media, financial documentation, and youth communication networks between 2025 and 2026, illustrating how various thematic domains exhibit differing rates and mechanisms of adaptation.

Table 1: Distribution and Structural Adaptation of Contemporary Loanwords in Uzbek (2025–2026)

Domain	Core Source Lexemes	Primary Adaptation Model	Grammatical Integration Type	Lexical/Semantic Outcome
Information Technology	<i>Browser, Cloud, Server, Platform, Online, Login</i>	Direct Phonological Importation	Noun Root + Native Case/Plural Suffixes (<i>serverda, platformalar</i>)	Complete functional substitution of native calques
Finance & Economics	<i>Traders, Startup, Investment, Blockchain, Crypto</i>	Hybrid Morphological Synthesis	Compound Verbs via Native Auxiliaries (<i>investitsiya qilmoq</i>)	Semantic narrowing to specialized commercial discourse

Youth Subcultures	<i>Krinj</i> (Cringe), <i>Haip</i> (Hype), <i>Chill</i> , <i>Trand</i> (Trend)	Phonetic Adaptation & Vernacularization	Adjectival/Verbal Conversion (<i>krinj</i> <i>bo'lmoq</i> , <i>chill</i> <i>qilmoq</i>)	Reshaping informal communication norms and registers	of

The data compiled in Table 1 illustrates that information technology terms show the most rapid and uninhibited integration, frequently displacing institutionalized native calques like "kompyuterlashgan tarmoq" or "tizim" in favor of direct, universally understood expressions such as *platforma* or *server*. Morphologically, these nouns remain stable bases that accept local suffixes seamlessly, demonstrating that the syntactic requirements of Uzbek easily accommodate foreign additions. In the economic sector, the integration frequently relies on hybrid structures, notably the combination of a borrowed noun with a native light auxiliary verb like *qilmoq* (to do) or *bo'lmoq* (to be), which transforms abstract international concepts into operational Uzbek verbal phrases. Meanwhile, the youth subculture domain showcases a creative vernacularization where terms like *krinj* or *haip* undergo phonological modifications to align with local speech habits, ultimately operating as powerful markers of identity and modern social alignment among younger generations.

The semantic shifts associated with these modern borrowings reveal that loanwords do not merely coexist with the native lexicon but actively reshape existing semantic fields through processes of narrowing, broadening, and direct calquing. When an international term is adopted, it frequently causes a restriction in the meaning of the existing native equivalent, reintroducing the native word into a narrower, traditional context while the loanword assumes a broader, modern, or prestigious connotation. This dual-track lexical development creates localized semantic hierarchies where the choice between a native word, a historical Russian loan, and a modern English borrowing signals specific sociolinguistic variables, including the speaker's educational background, professional orientation, and generational affiliation. Furthermore, the extensive reliance on digital translation tools and automated translation models has accelerated the emergence of phraseological calques, wherein English syntactic structures are translated literally into Uzbek words, subtly altering the normative collocations and stylistic flow of contemporary journalistic and academic prose.

The institutional reaction to this rapid linguistic evolution remains complex, characterized by a persistent tension between purist language planning policies and the practical communicative needs of a globalizing society. Official state language committees and national academies consistently strive to develop native alternatives or utilize existing Turkic, Arabic, or Persian roots to stem the tide of unrestricted anglicization. However, the rapid deployment of new technologies and global socio-economic concepts often outpaces the bureaucratic speed of official linguistic standardization, causing artificial or archaic calques to fail to achieve widespread public adoption. The preference among younger speakers and professionals for direct borrowings over artificial neologisms underlines a pragmatic approach to language, where communicative efficiency and global alignment take precedence over purist ideals. This division between prescriptive state norms and descriptive vernacular usage highlights a critical phase of language change, where everyday social practice serves as the primary driver of lexical evolution.

Ultimately, the structural and lexical changes observed in contemporary Uzbek between 2025 and 2026 reinforce the view that borrowing is not a form of linguistic erosion, but an active adaptive strategy that keeps a language relevant within a globalized environment. The structural framework of Uzbek proves robust enough to swallow large volumes of foreign terminology without losing its distinctive agglutinative identity or grammatical core. As these loanwords move from informal youth slang and technical jargon into mainstream media, literature, and official public discourse, they alter the overall stylistic and semantic tapestry of the language. This ongoing transition marks a vital chapter in the history of Central Asian

sociolinguistics, indicating that contemporary Uzbek is successfully evolving from a post-Soviet language model into a highly dynamic, digitally integrated global tongue capable of expressing the complex realities of modern life.

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A Comparative Analysis of Pragmatic Potential in Source and Translated Texts

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Abstract

This thesis presents a comparative analysis of pragmatic potential in source and translated texts. The study examines communicative intentions, the author's purpose, and the extent to which pragmatic features are preserved in translation. Particular attention is paid to translators' strategies in conveying pragmatic meaning, speech acts, and cultural elements. The findings emphasize the importance of achieving pragmatic equivalence to maintain the communicative effect and functional value of the original text in translation. Kalit so'zlar: pragmatik salohiyat, asliyat matni, tarjima matni, qiyosiy tahlil, pragmatik ekvivalentlik, kommunikativ maqsad, tarjima strategiyalari, pragmatika.

Keywords: pragmatic potential, source text, translated text, comparative analysis, pragmatic equivalence, communicative intention, translation strategies, pragmatics, speech acts, cultural adaptation.

Introduction. In the context of globalization and the rapid development of intercultural communication, translation has become an essential means of facilitating the exchange of information, knowledge, and cultural values among different nations. Modern translation studies emphasize that translation is not merely the transfer of linguistic forms from one language into another; rather, it is a complex process of reproducing the communicative intention, functional value, and pragmatic effect of the original text.

Pragmatics, as a branch of linguistics, studies how language is used in context and how meaning is interpreted by speakers and listeners in particular communicative situations. The pragmatic potential of a text refers to its ability to influence the recipient, convey the author's intention, and achieve a specific communicative purpose. Therefore, preserving pragmatic potential in translation is one of the major challenges faced by translators.

Differences in linguistic structures, cultural norms, social conventions, and communicative strategies often make it difficult to achieve complete pragmatic equivalence between the source text and the translated text. As a result, translators are required not only to possess linguistic competence but also to demonstrate intercultural awareness and strategic decision-making skills. The successful transmission of pragmatic meaning ensures that the target audience receives the translated message in a manner similar to that of the original audience. The present study aims to conduct a comparative analysis of pragmatic potential in source and translated texts by examining how communicative intentions, speech acts, implicatures, and culturally specific elements are rendered in translation. The study also highlights the importance of pragmatic equivalence as a key indicator of translation quality and effectiveness. By investigating the pragmatic aspects of translation, this research contributes to a deeper understanding of the relationship between language, culture, and communication within the field of translation studies.

Main Body. Pragmatics plays a significant role in contemporary translation studies because it focuses on the relationship between language, context, and communicative intention. Unlike semantic analysis, which deals primarily with the literal meaning of linguistic units, pragmatic analysis examines how meaning is constructed and interpreted in specific communicative situations. Therefore, the translator's task extends beyond lexical and grammatical equivalence to the reproduction of the pragmatic effect of the source text.

One of the key aspects of pragmatic analysis in translation is the identification and transfer of communicative intentions. The source text is created with a particular purpose, such as informing, persuading, requesting, criticizing, or entertaining the audience. Failure to preserve these intentions may result in a translated text that conveys the informational content accurately but loses its intended impact on the target audience. According to Nida (1964), successful translation should produce a response in the target audience that is substantially equivalent to that experienced by the original audience.

Speech Act Theory also provides an important framework for understanding pragmatic potential in translation. Austin (1962) argued that utterances do not merely describe reality but perform actions. Similarly, Searle (1969) classified speech acts into categories such as directives, representatives, commissives, expressives, and declarations. Translators must recognize the illocutionary force of an utterance in order to reproduce its communicative function appropriately.

For example, the English sentence "Could you close the door, please?" is grammatically an interrogative structure; however, pragmatically it functions as a polite request. A literal translation that ignores its pragmatic function may alter the degree of politeness intended by the speaker. Consequently, translators should consider the social relationship between interlocutors and the conventions of the target culture when selecting equivalent expressions (Searle, 1969).

Another important element of pragmatic potential is implicature. Grice (1975) introduced the concept of conversational implicature to explain how speakers often communicate meanings indirectly. In many cases, the intended message cannot be understood solely through the literal interpretation of words but requires contextual knowledge and shared assumptions. Translating implicatures presents a considerable challenge because target readers may not possess the same cultural and contextual background as the original audience.

For instance, the statement "It's getting late" may simply indicate the passage of time, but in a particular context it can imply that guests should leave or that an activity should come to an end. The translator's ability to identify and convey such implied meanings determines whether the pragmatic effect of the original text is maintained (Grice, 1975).

Cultural factors also contribute significantly to the pragmatic dimension of translation. Every language reflects the values, traditions, beliefs, and social norms of its speech community. Expressions of politeness, forms of address, idiomatic expressions, and culturally bound references often require adaptation rather than literal translation. Newmark (1988) emphasizes that cultural translation strategies are essential for preserving the communicative effectiveness of the original text.

Moreover, Baker (2018) notes that translators frequently employ pragmatic strategies such as explicitation, omission, paraphrase, and cultural substitution to bridge gaps between source and target cultures. These strategies help target readers interpret the text appropriately while maintaining the intended function of the original message.

The concept of pragmatic equivalence has therefore become a central issue in translation studies. Pragmatic equivalence refers to the successful transfer of intended meaning, communicative purpose, and audience effect from the source text into the target text. Achieving this type of equivalence requires translators to possess linguistic competence, cultural awareness, and analytical skills. The translator acts as an intercultural mediator who negotiates meaning between different linguistic and cultural systems (Baker, 2018).

A comparative analysis of source and translated texts demonstrates that pragmatic shifts are often inevitable due to structural and cultural differences between languages. However, these shifts should not distort the author's communicative intention. Instead, they should facilitate effective communication and ensure that the target audience experiences a response similar to that of the source audience. Consequently, preserving pragmatic potential should be regarded as one of the principal criteria for assessing translation quality.

In conclusion, the comparative analysis of pragmatic potential in source and translated texts demonstrates that successful translation involves much more than the transfer of lexical meanings and grammatical structures. The translator is expected to preserve the communicative intention, pragmatic effect, and functional value of the original text while adapting it to the linguistic and cultural norms of the target audience.

The findings of this study indicate that pragmatic elements such as speech acts, implicatures, politeness strategies, presuppositions, and culture-specific expressions play a crucial role in determining translation quality. The omission or inaccurate rendering of these elements may lead to misunderstandings and reduce the effectiveness of communication. Therefore, achieving pragmatic equivalence should be regarded as one of the fundamental objectives of the translation process.

Furthermore, the study highlights the translator's role as an intercultural mediator who bridges the gap between different languages and cultures. To accomplish this task effectively, translators must combine linguistic competence with pragmatic awareness and cultural sensitivity. The application of appropriate translation strategies, including adaptation, explicitation, paraphrasing, and cultural substitution, contributes significantly to preserving the intended impact of the source text on the target readership (Baker, 2018).

It can also be concluded that pragmatic shifts are often unavoidable because of differences in social conventions, communicative practices, and cultural backgrounds. However, such shifts should aim to maintain the author's original intention and ensure that the target audience receives a message that is functionally equivalent to that of the source audience. This approach corresponds to Nida's concept of dynamic equivalence, which emphasizes the importance of producing a similar response in both audiences (Nida, 1964).

Finally, the present study contributes to a deeper understanding of the relationship between language, culture, and communication in translation studies. Future research may focus on examining pragmatic potential in specific genres such as literary works, media discourse, audiovisual translation, and digital communication. Such investigations would further enrich the theoretical foundations of pragmatics and provide practical guidance for improving translation quality in various fields.

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Effective Mechanisms for Developing the Social Entrepreneurship Ecosystem in Higher Education Institutions

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Abstract

This paper explores the comprehensive and systemic mechanisms required to develop an effective social entrepreneurship ecosystem within higher education institutions (HEIs). As universities transition from purely knowledge-disseminating entities to catalysts for societal transformation, the integration of social entrepreneurship becomes paramount. The study identifies structural, pedagogical, and collaborative frameworks that successfully nurture student-led socially conscious ventures. By examining institutional support systems, interdisciplinary curriculum design, funding infrastructure, and multi-stakeholder partnerships, the article outlines an optimized framework for academic environments. Ultimately, the paper provides actionable insights for policymakers and university administrators aiming to align modern higher education with sustainable development goals through systematic social innovation.

Keywords: Social Entrepreneurship, Higher Education Institutions, Ecosystem Development, Academic Innovation, Institutional Frameworks, Sustainable Development Goals.

The contemporary paradigm of higher education is undergoing a profound transformation, moving beyond the traditional dual mission of teaching and research toward a "third mission" centered on societal engagement and socioeconomic impact. In this evolving landscape, developing an effective social entrepreneurship ecosystem within higher education institutions (HEIs) has emerged as a crucial mechanism for addressing complex societal challenges while equipping students with future-ready competencies. Social entrepreneurship in academia does not merely entail teaching business skills with a philanthropic twist; rather, it demands a holistic ecosystem that integrates mindsets, institutional structures, pedagogical innovations, and external networks into a cohesive, self-sustaining framework. To understand the operationalization of this ecosystem, one must first examine the foundational layer of institutional commitment and policy alignment. For an ecosystem to thrive, the university's strategic vision must explicitly recognize social entrepreneurship as a core pillar of academic identity. This strategic intent must manifest in concrete structural adjustments, such as the establishment of dedicated social innovation centers, incubators, and accelerators that operate cross-departmentally. Traditionally, entrepreneurship education has been siloed within business schools, an organizational structure that severely limits its potential because the root drivers of social innovation—such as empathy, deep sociological understanding, and environmental science—reside in the humanities, social sciences, and technical faculties. Therefore, an effective ecosystem bypasses these traditional departmental boundaries, creating an open, interdisciplinary playground where an engineering student, a sociology major, and an MBA candidate can co-create solutions. This horizontal integration requires flexible administrative processes that reward cross-faculty collaboration and allow for modular, interdisciplinary credit accumulation. Furthermore, the structural framework must include robust incentive mechanisms for faculty members. Professors and researchers are often bound by traditional performance metrics focused heavily on high-impact journal publications; to foster a social entrepreneurship ecosystem, institutions must expand tenure and promotion criteria to value applied research, community-engaged scholarship, and the mentorship of student-led social ventures.

Beyond structural re-engineering, the pedagogical approach within HEIs must shift from passive, rote learning toward action-oriented, experiential learning models that mirror real-world complexities. Traditional lecture-based models are fundamentally inadequate for cultivating the entrepreneurial mindset, which requires resilience, ambiguity tolerance, and critical problem-solving skills. Effective ecosystems deploy challenge-based learning paradigms where students are confronted with actual community problems, requiring them to apply human-centered design principles, conduct field research, and iterate prototypes. This pedagogical shift transforms the classroom from a site of knowledge consumption into a laboratory for social experimentation. Coursework should be intentionally designed to guide students through the entire lifecycle of a social venture, from empathetic problem identification and stakeholder mapping to business model formulation using tools like the Social Lean Canvas. Additionally, integrating service-learning components into standard curricula ensures that academic theories are continuously tested against grounded social realities. This experiential approach is significantly enhanced when universities leverage digital learning platforms and simulation tools, allowing students to model the systemic impact and scalability of their interventions before deploying physical resources. Faculty development plays a pivotal role in this pedagogical transition; institutions must invest in continuous training programs that equip educators with facilitation skills, design-thinking methodologies, and an understanding of contemporary social financing mechanisms. By redefining the role of the educator from an omniscient lecturer to a collaborative coach, universities can create a more vibrant, student-centric innovation culture.

However, pedagogical excellence and structural alignment remain incomplete without the architecture of robust financial and infrastructural support systems internal to the university. The transition from an innovative conceptual idea to a viable, scalable social venture is often hindered by the "valley of death"—the precarious early stage where initial enthusiasm faces a lack of capital and physical resources. Higher education institutions must bridge this gap by establishing internal seed-funding mechanisms, proof-of-concept grants, and social impact investment funds specifically earmarked for student and faculty innovators. These financial tools should be structured not merely as handouts, but as educational instruments that teach students how to navigate milestone-based funding, financial accountability, and social return on investment (SROI) metrics. Alongside capital, the physical infrastructure—such as co-working spaces, maker spaces, and prototyping labs—must be easily accessible, fostering a dense environment of serendipitous interactions among diverse student cohorts. These spaces should serve as physical anchors for the ecosystem, hosting hackathons, ideation bootcamps, and networking mixers that keep the community engaged and motivated. Crucially, the internal ecosystem must also provide comprehensive legal and intellectual property (IP) advisory services; social entrepreneurs often navigate complex regulatory environments, particularly when blending non-profit missions with for-profit operational structures, and expert guidance at the early stages is vital to ensuring long-term institutional viability and compliance.

While internal dynamics are vital, a university social entrepreneurship ecosystem cannot operate in isolation from the broader external socio-economic environment. The true measure of an ecosystem's maturity lies in its ability to construct and maintain fluid, multi-stakeholder partnerships with industry, government agencies, non-governmental organizations (NGOs), and local communities. This external network functions as both a source of authentic problem statements and a destination for scalable solutions. By forming strategic alliances with local municipalities and regional development agencies, HEIs can position themselves as research and development hubs for regional social challenges, thereby unlocking public funding and policy support. Partnerships with established corporate entities and social enterprises provide students with invaluable mentorship, internship opportunities, and access to corporate social responsibility (CSR) funding pipelines. Furthermore, engaging alumni networks creates a powerful intergenerational mentorship loop, where seasoned entrepreneurs and professionals

return to the university to guide nascent student ventures, provide market validation, and offer pathways to venture venture capital. These external linkages must be formalized through advisory boards and collaborative platforms, ensuring that the university's social entrepreneurship activities remain dynamically aligned with market demands and real-world socioeconomic priority areas.

Ultimately, the sustainability and continuous improvement of a social entrepreneurship ecosystem within higher education depend heavily on the implementation of rigorous monitoring, evaluation, and impact measurement frameworks. Institutions must move away from superficial metrics, such as the sheer number of students enrolled in entrepreneurship courses or the volume of ideas generated during a weekend hackathon. Instead, evaluation matrices must capture deep, long-term indicators, including the survival rate of incubated social ventures, the amount of external capital attracted, the volume of jobs created, and, most importantly, the quantifiable social or environmental changes brought about by these ventures in target communities. Measuring social impact requires sophisticated methodologies like Social Return on Investment (SROI) and alignment with the United Nations Sustainable Development Goals (SDGs), which should be embedded into the ecosystem's tracking systems. These data points not only justify internal institutional resource allocation and attract external philanthropic or public funding, but they also feed back into the curriculum and structural design, allowing the university to iterate and optimize its ecosystem mechanisms over time. Through this continuous loop of action, measurement, and adaptation, higher education institutions can effectively institutionalize social innovation, transforming themselves into true engines of equitable and sustainable societal progress.

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Innovative Approaches to Supporting Social Entrepreneurship Activities in Higher Education Institutions

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Abstract

This paper comprehensively analyzes the innovative approaches to supporting social entrepreneurship activities within higher education institutions (HEIs). As global socioeconomic challenges multiply, universities are moving away from traditional, profit-centric business support models to foster systems that prioritize sustainable societal impact. This study explores the structural, financial, and pedagogical mechanisms necessary to cultivate a vibrant social innovation culture among students and faculty members. By examining cross-disciplinary educational models, blended internal funding mechanisms, co-creative community spaces, and long-term socio-economic impact metrics aligned with sustainable development goals, the article provides a holistic framework for academic governance. Ultimately, this research offers academic administrators and policymakers conceptual and practical strategies to transform universities into active engines of local and global social transformation through modernized institutional backing.

Keywords: Social Entrepreneurship, Higher Education Support, Innovative Pedagogy, Structural Transformation, Institutional Ecosystems, Academic Social Responsibility.

The contemporary role of higher education institutions (HEIs) is undergoing a structural transformation, shifting from the traditional transmission of knowledge toward a proactive model of societal engagement known as the university's "third mission." In this modern landscape, fostering social entrepreneurship within academic walls has transitioned from an elective extracurricular interest into an essential institutional imperative. To effectively support these socially driven ventures, modern universities must move past conventional, profit-oriented incubator frameworks and embrace truly innovative, systemic approaches that prioritize systemic societal value over short-term financial returns. The foundation of this support structure lies in the strategic and structural re-engineering of the institution itself, ensuring that social innovation is deeply integrated into the university's identity rather than marginalized within specific academic silos. Historically, business incubation and entrepreneurial training have been the exclusive domain of economic and business faculties, which structurally detaches these programs from the humanities, social work, and technical fields where real-world social problems are deeply understood and experienced. An innovative approach to resolving this silo effect involves the creation of university-wide, centralized social innovation hubs that act as horizontal platforms connecting students and researchers across every discipline. By creating a collaborative space where a software engineering student can partner with a sociology major and an environmental scientist, the institution effectively democratizes social entrepreneurship, allowing diverse perspectives to co-create comprehensive, robust business models that address deep-seated community issues like educational inequality, environmental degradation, and public health disparities. This horizontal institutional architecture requires flexible academic policies that reward faculty members for cross-departmental collaboration, modify traditional tenure and promotion metrics to value community-engaged scholarship, and allow students to earn modular academic credits for launching practical social ventures.

Simultaneously, the pedagogical paradigms employed within these ecosystems must undergo a radical shift from passive classroom learning toward immersive, action-oriented experiential

models that mirror the unpredictable dynamics of the real-world social sector. Traditional lecture-based delivery proves fundamentally inadequate for cultivating the specific psychological competencies required of social entrepreneurs, such as adaptive empathy, systemic thinking, and resilience in the face of structural market failures. Innovative support mechanisms address this gap by institutionalizing challenge-based learning frameworks and service-learning pedagogies directly into core curricula across all fields of study. In these models, students do not simply study theoretical case studies; they are embedded within local municipalities, non-governmental organizations (NGOs), or marginalized neighborhoods to conduct field research and map complex stakeholder networks. Utilizing modern frameworks like the Social Lean Canvas and human-centered design principles, student teams spend entire semesters iteratively developing, prototyping, and refining business models that directly address the specific structural friction points identified in the community. This pedagogical innovation transforms the traditional classroom from a site of static information consumption into an active lab for social experimentation and systemic change. Furthermore, to sustain this shift, universities must invest heavily in continuous professional development for their educators, training them to move away from the traditional role of omniscient lecturers and instead become active project facilitators, ecosystem coaches, and design-thinking mentors capable of guiding students through complex socio-economic realities.

Crucially, even the most philosophically sound pedagogical model will fail if the institution lacks an innovative financial and physical infrastructure designed to navigate the unique challenges of the social sector. Unlike traditional commercial startups, which can pitch to conventional venture capitalists based on rapid scalability and projected financial returns, social enterprises often operate on thin margins and generate a hybrid return on investment that blends modest financial sustainability with high societal impact. To bridge the initial funding gap, known colloquially as the "valley of death" where early-stage projects collapse due to a lack of resources, innovative HEIs are developing internal, specialized financial mechanisms such as blended finance pools, university-backed proof-of-concept grants, and micro-equity social impact funds. These internal resources should not be distributed as passive philanthropic donations; instead, they must function as active educational instruments where students learn to hit specific, milestone-based performance targets and manage financial accountability. Alongside this flexible capital, the physical environment provided by the university must change, evolving from isolated study areas into shared co-working spaces, rapid prototyping labs, and maker spaces that remain accessible to all student cohorts. By concentrating diverse talents within these creative hubs, universities deliberately foster a dense environment of serendipitous interactions, allowing ideas to cross-pollinate naturally through hackathons, ideation bootcamps, and public pitch competitions that keep the internal campus community highly motivated and socially engaged.

Moreover, a university's internal ecosystem cannot achieve true scalability if it remains decoupled from the broader external multi-stakeholder landscape that surrounds the institution. An innovative support model recognizes that the academic institution must serve as an active bridge connecting student innovators with external industries, governmental bodies, civil society organizations, and local alumni networks. By forming formalized, long-term strategic alliances with regional municipalities and public development agencies, HEIs can position their student innovation labs as the primary research and development centers for regional civic challenges, thereby unlocking public funding streams and directly influencing municipal social policies. Partnerships with established corporations and large-scale social enterprises offer students invaluable access to high-level executive mentorship, real-world market validation pipelines, and direct integration into corporate social responsibility (CSR) budgets. Furthermore, leveraging the institution's global alumni network establishes an invaluable intergenerational mentorship flywheel, wherein experienced business leaders, legal experts, and social advocates return to the university ecosystem to provide practical legal counseling,

navigate complex hybrid regulatory models, and offer direct access to global venture philanthropy networks. These multi-stakeholder networks must be actively structured through collaborative platforms and formal advisory boards, ensuring that the student-led social ventures remain permanently aligned with evolving market demands and authentic community priorities.

Finally, the long-term viability and internal justification of these innovative support systems depend heavily on the institutionalization of sophisticated monitoring, evaluation, and impact measurement frameworks that transcend superficial administrative metrics. Historically, universities have measured the success of their entrepreneurship initiatives using basic, quantitative metrics such as the total number of students enrolled in entrepreneurship electives, the volume of ideas pitched at a weekend competition, or the number of business plans written. To accurately capture the unique nature of social innovation, HEIs must pivot toward rigorous, long-term evaluation systems that measure actual socio-economic and environmental outcomes over several years. This involves adopting advanced methodologies such as the Social Return on Investment (SROI) framework and systematically mapping every incubated project's outcomes directly against the United Nations Sustainable Development Goals (SDGs). By tracking complex longitudinal indicators—such as the long-term survival rate of incubated social ventures, the volume of external impact capital attracted, the number of localized jobs created for vulnerable populations, and the measurable reduction of carbon emissions or educational gaps in target communities—the university generates a robust dataset. This analytical feedback loop does not merely justify internal resource allocation to university boards and state donors; it serves as a dynamic diagnostic tool that allows university administrators to constantly iterate, refine, and optimize their structural, pedagogical, and financial support mechanisms over time, transforming higher education into a powerful engine for a more equitable and sustainable world.

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