

**NAMANGAN DAVLAT UNIVERSITETI HUZURIDAGI ILMIY
DARAJALAR BERUVCHI PhD.03/04.06.2020.Ped.76.02 RAQAMLI ILMIY
KENGASH ASOSIDAGI BIR MARTALIK ILMIY KENGASH**

NAMANGAN DAVLAT UNIVERSITETI

AHMADJONOVA ODINA ANVARJON QIZI

**INGLIZ TILI DARSLARIDA O‘QUVCHILARNING O‘QISH
KOMPETENSIYASINI RIVOJLANTIRISH METODIKASI
(STEAM ta’lim texnologiyasi misolida)**

13.00.02 – Ta’lim va tarbiya nazariyasi va metodikasi (ingliz tili)

**PEDAGOGIKA FANLARI bo‘yicha falsafa doktori (PhD) dissertatsiyasi
AVTOREFERATI**

Namangan – 2025

**Pedagogika fanlari bo‘yicha falsafa doktori (PhD) dissertatsiyasi
avtoreferati mundarijasi**

**Contents of dissertation abstract of philosophy doctor (PhD) on
pedagogical sciences**

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педагогическим наукам**

Ahmadjonova Odina Anvarjon qizi

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Namangan – 2025

Falsafa doktori (PhD) dissertatsiyasi mavzusi O‘zbekiston Respublikasi Oliy ta’lim, fan va innovatsiyalar vazirligi huzuridagi Oliy attestatsiya komissiyasida B2023.3.PHD/Ped4964 raqam bilan ro‘yxatga olingan.

Dissertatsiya Namangan davlat universitetida bajarilgan.

Dissertatsiya avtoreferati uch tilda (o‘zbek, ingliz, rus (rezyume) Ilmiy kengash veb-sahifasi (www.namdu.uz) va “Ziyonet” Axborot ta’lim portali (www.ziyonet.uz) manzillarida joylashtirilgan.

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Andijon davlat chet tillar instituti

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Dissertatsiya bilan Namangan davlat universiteti Axborot-resurs markazida tanishish mumkin. (_____-raqami bilan ro‘yxatga olingan). (Manzil: 160107, Boburshoh ko‘chasi, 161-uy. Tel.: (+99869) 228-85-01).

Dissertatsiya avtoreferati 2025-yil “_____” _____ kuni tarqatildi.
(2025-yil “_____” _____ dagi _____ raqamli reyestr bayonnomasi).

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KIRISH (falsafa doktori (PhD) dissertatsiyasi annotatsiyasi)

Dissertatsiya mavzusining dolzarbligi va zaruriyati. Jahonda ta'lim sohasini rivojlantirish masalasi dolzarb vazifalardan biri sifatida e'tirof etilmoqda. Ta'lim har bir davlatning ma'naviy-ma'rifiy, madaniy hayoti va ijtimoiy-iqtisodiy taraqqiyotini belgilab beruvchi asos hisoblanadi. Mamlakatlar o'rtasidagi ijtimoiy-iqtisodiy va madaniy hamkorlikning kuchayishi chet tillar, ayniqsa, ingliz tilini nutqiy muloqot vositasi sifatida o'rganishga bo'lgan qiziqish, ehtiyoj hamda intilishlarini kuchaytirib yubordi. Har bir o'quvchining shaxsiy rivojlanish imkoniyatlarini hisobga olgan holda, zamonaviy o'qitish tizimida yangi ta'lim texnologiyalari, jumladan, STEAM - ta'lim texnologiyasi asosida o'quvchilarda fanlarga oid kompetensiyalarni rivojlantirish, ularda mustaqil fikrlash, ijodkorlik, yaratuvchanlik, tashabbuskorlik, nutqiy muloqotga tezda kirisha olish, tanqidiy fikrlash kabi xususiyatlarni shakllantirishga alohida e'tibor qaratilmoqda. Bu esa o'z navbatida, ta'lim sohasining ajralmas bo'g'ini bo'lgan o'rta umumta'lim maktablarida fanlarni o'qitishida STEAM ta'lim texnologiyasidan foydalanish zaruriyatini taqozo etadi. Xususan, ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishning metodik asoslarini takomillashtirish zaruratini ham yuzaga keltirmoqda.

Dunyo miqyosida chet til o'qitish metodikasida ta'lim oluvchilarni kasbiy faoliyatga tayyorlashda turli metod, yondashuv va ta'lim texnologiyalarni takomillashtirish ustida ilmiy-tadqiqot ishlari olib borilmoqda. Xususan, ingliz tilini chet til sifatida o'qitish – TEFL (Teaching English as a Foreign Language), ingliz tilini ikkinchi til sifatida o'qitish – TESL (Teaching English as Secondary Language), o'zga tilli so'zlovchilarga ingliz tilini o'qitish – TESOL (Teaching English to Speakers of Other Languages), katta yoshdagi o'rganuvchilarga ingliz tilini o'qitish – CELTA (Certificate in English Language Teaching to Adults) kabi kasbiy malaka va darajalarni taqdim etuvchi xalqaro tashkilotlarning amaliy loyihalari negizida nutqiy muloqot kompetensiyasini rivojlantirish tizimini takomillashtirish ilmiy-amaliy ahamiyat kasb etmoqda. Ayni paytda, o'quvchilarning bilim darajasini jahon standartlari talablariga moslashtirish maqsadida zamonaviy o'qitish ta'lim dasturlarining samaradorlik ko'rsatkichini belgilashga ham katta e'tibor qaratilmoqda. Shunday talablarga javob bera oladigan zamonaviy ta'lim yondashuvlarining biri sifatida dunyo maktab ta'limida – STEAM ta'lim texnologiyasiga alohida e'tibor qaratilmoqda. Mazkur ta'lim texnologiyasi o'quvchilarda ilmiy-texnologik, konstruktiv, badiiy-estetik va matematik kompetensiyalarni rivojlantirishga xizmat qiladi. Bu esa, yuqori sinflarda ingliz tili o'qitish jarayoniga STEAM – ta'lim texnologiyasini joriy etish orqali o'quvchilarda o'qish kompetensiyasini rivojlantirishni taqozo etadi.

Respublikamizda ta'lim bosqichlarini modernizatsiyalash jarayonini innovatsion yondashuvlar asosida tashkil etish va chet til darslarini zamonaviy talablarga asoslangan holda tashkil etish va fanlararo integratsiyasini ta'minlash, chet til o'qitishda amaliy izlanuvchan faoliyatga yo'naltirilgan STEAM – ta'lim texnologiyasini joriy etishga katta e'tibor qaratilmoqda.

O‘zbekiston Respublikasi Prezidentining 2019-yil 29-apreldagi “O‘zbekiston Respublikasi Xalq ta’limi tizimini 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida”gi PF-5712-son farmonida “STEAM fanlarni va tanqidiy fikrlash, axborotni mustaqil ishlash va tahlil qilish kompetensiyalari hamda malakalarini rivojlantirishga alohida urg‘u berishini hisobga olgan holda, zamonaviy innovatsion iqtisodiyot talablariga javob beradigan umumta’lim dasturlari va yangi davlat ta’lim standartlari joriy etish” kabi vazifalar aniq belgilab berilgan¹. Shuningdek, mazkur konsepsiyada xalqaro malaka talablariga mos raqobatbardosh, xorijiy tillarda erkin muloqot qiluvchi malakali kadrlar tayyorlash ustuvor vazifalardan etib belgilangan. Shu bilan birga O‘zbekiston Respublikasi Prezidentining 2020-yil 27-fevraldagi “Pedagogik ta’lim sohasini yanada rivojlantirish chora-tadbirlari to‘g‘risida”gi PQ-4623-son Qarorida umumiy o‘rta ta’limni milliy pedagogik tajriba va xalqaro ta’lim dasturlariga asoslangan holda rivojlantirish vazifasi qo‘yilgan edi. Xalqaro baholash dasturlari - PIRLS, PISA, TIMSS, EGMA, EGRA talablariga mos keladigan topshiriqlar bilan ishlashga mo‘ljallangan STEAM – ta’lim texnologiyasini maktab ta’limi tizimiga, xususan, yuqori sinflarda ingliz tili o‘qitishga integrativ tarzda joriy etish shart-sharoitlarini takomillashtirishni taqozo etadi.

Mazkur dissertatsiya tadqiqoti O‘zbekiston Respublikasi Prezidentining 2019-yil 29-apreldagi PF-5712-son “O‘zbekiston Respublikasi Xalq ta’limi tizimini 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida”, 2020-yil 6-noyabrdagi PF-6108-son “O‘zbekistonning yangi taraqqiyot davrida ta’lim-tarbiya va ilm-fan sohalarini rivojlantirish chora-tadbirlari to‘g‘risida”, 2022-yil 28-yanvardagi PF-60-son “2022-2026-yillarga mo‘ljallangan yangi O‘zbekistonning taraqqiyot strategiyasi to‘g‘risida”, 2022-yil 11-maydagi PF-134-son “2022-2026-yillarda Xalq ta’limini rivojlantirish bo‘yicha Milliy dasturni tasdiqlash to‘g‘risida”gi farmonlari, 2019-yil 16-yanvardagi PQ-4119-son “Ta’lim sifatini nazorat qilish tizimini takomillashtirish bo‘yicha qo‘shimcha chora-tadbirlari to‘g‘risida”, 2021-yil 19-maydagi PQ-5117-son “O‘zbekiston Respublikasida xorijiy tillarni o‘rganishni ommalashtirish faoliyatini sifat jihatidan yangi bosqichga olib chiqish chora-tadbirlari to‘g‘risida”gi qarorlari hamda mazkur sohaga taalluqli boshqa me‘yoriy-huquqiy hujjatlardagi belgilangan vazifalarni amalga oshirishda muayyan darajada xizmat qiladi.

Tadqiqotning respublika fan va texnologiyalarni rivojlantirishning ustuvor yo‘nalishlariga mosligi. Mazkur tadqiqot respublika fan va texnologiyalar rivojlanishining “I. Axborotlashgan jamiyat va demokratik davlatni ijtimoiy, huquqiy, iqtisodiy, madaniy, ma’naviy-ma’rifiy rivojlantirish, innovatsion g‘oyalar tizimini shakllantirish hamda ularni amalga oshirish yo‘llari” ustuvor yo‘nalishiga muvofiq bajarilgan.

Muammoning o‘rganilganlik darajasi. Mamlakatimizda ingliz tili o‘qitishning ilmiy-nazariy muammolari, chet tilda til va nutqiy malakalarni rivojlantirishning lingvistik va lingvodidaktik asoslari, ingliz tilida o‘qish

¹ O‘zbekiston Respublikasi Prezidentining 2019 yil 29 apreldagi “O‘zbekiston Respublikasi Xalq ta’limi tizimini 2030 yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida”gi PF-5712-son farmoni. - Elektron resurs <https://lex.uz/docs/4312785>.

kompetensiyasini rivojlantirishda matnlarning oʻrni va ahamiyati, sohaviy autetik matnlarni oʻqishni oʻrgatishning lingvistik va lingvodidaktik tavsifi, maqsadi, vazifalari hamda mazmuni, ingliz tilida matnlarni oʻqishni oʻrgatish bosqichlari, shakli, usullari, tamoyillari va vositalariga oid masalalari J.J.Jalolov, T.Q.Sattorov, S.S.Saydaliyev, S.A.Misirov, D.M.Isroilova, D.A.Saimnazarova, A.V.Ermirzayev va U.Y.Soliyevlar tomonidan tadqiq etilgan².

Umumtaʼlim maktablarida fanlarni turli yondashuvlar asosida oʻqitish, STEAM – taʼlim texnologiyasi asosida maktab oʻquvchilarining tayanch va fanga oid kompetensiyalarini rivojlantirish, tabiiy va aniq fanlarni STEAM – taʼlim texnologiyasi asosida oʻqitishning pedagogik, metodik va psixologik muammolari F.J.Masharipova, M.X.Tashibekova, Sh.B.Xasanova, J.Tolipova, Z.B.Sangirova, N.B.Zoyirova, K.A.Boymatova, M.G.Burxonova, M.S.Orifjonova, M.Y.Miralimova, Sh.R.Turdiyev va M.P.Elboyevalar tomonidan oʻrganilgan³.

Mustaqil davlatlar hamdoʻstligi (MDH) olimlari I.A.Popova, Y.N.Pankratova, S.A.Krilova, N.V.Vaskina, L.I.Repkina, Y.S.Kuznesova va N.M.Lojkinalarning ilmiy-tadqiqotlarida chet tilda oʻqish kompetensiyasini rivojlantirishning psixologik va psixolingvistik jihatlari, shuningdek, chet tilda kasbga oid sohaviy matnlarni oʻqishni oʻrgatish orqali talabalarning lingvistik kompetensiyasini rivojlantirishning oʻziga xos metodik jihatlari tadqiq qilingan⁴.

² Jalolov J.J. Chet til oʻqitish metodikasi. Chet tillar oliy oʻquv yurtlari (fakultetlari) talabalari uchun darslik qayta ishlangan va toʻldirilgan 2-nashri. –Toshkent: Oʻqituvchi, 2012. –B. 432.; Sattorov T.Q. Boʻlajak chet tili oʻqituvchisining uslubiy omilkorligini shakllantirish texnologiyasi. –T. –TDYUI, 2003.–B.191.; Saydaliyev S. Tillar oʻqitish metodikasi va taʼlim texnologiyalari (olmon tili misolida) – Namangan., 2019; Misirov S.A. Ingliz tili mashgʻulotlarida pedagogika va psixologiya yoʻnalishi talabalarining kasbiy kompetensiyasini takomillashtirish nazariyasi va amaliyoti. Ped. fan boʻyicha dok. (DSc) dis. Namangan, 2024. –B. 201.; Isroilova D.M. Nofilologik oliy oʻquv yurtlarida talabalarni fanlararo bogʻliqlikda kasbga yoʻnaltirilgan ingliz tiliga oʻqitish (texnologiya fakulteti misolida). Avtoref. dis. ... ped. fan. boʻyicha falsafa dok. –Toshkent, 2020. –B. 58.; Saimnazarova D.A. Talabalarga ingliz tilida matn oʻqishni oʻrgatishning innovatsion texnologiyalari. Ped. fan. boʻyicha falsafa dok. dis. –Toshkent., 2021. –B. 134.; Ermirzayev A.V. Yuqori sinf oʻquvchilarining sosiolingvistik kompetensiyasini mamlakatshunoslikka oid matnlarni oʻqish orqali rivojlantirish texnologiyasi. Ped. fan. boʻyicha falsafa dok. dis. – Namangan., 2022. –B. 144; Soliyev U.Y. Talabalarning ingliz tilida oʻqish kompetensiyasini rivojlantirish metodikasi (amaliy matematika yoʻnalishi misolida): Ped. fan. boʻyicha falsafa dok. dis. – Namangan., 2024. –B. 155.;

³ Masharipova F.J. CBI va STEAM texnologiyalari asosida boʻlajak biolog oʻqituvchilarning oʻqish kompetensiyasini takomillashtirish: Ped. fan. nomz. ... dis. –Urganch: UrDU, 2023. –B. 159.; Tashibekova M. Boshlangʻich sinflarda STEAM–taʼlim texnologiyasidan foydalanish metodikasi (tabiiy fanlar misolida).Diss (PhD).-Namangan -2022.B-170.; Xasanova Sh.B. Integrativ yondashuv asosida oʻquvchilarning tayanch va fanga oid kompetensiyalarini shakllantirish metodikasi (9-sinf biologiya fanini oʻqitish misolida). Diss. (PhD). –T.: 2019. –B.154.; Tolipova J. Tabiatshunoslik fanini oʻqitishda STEAM yondashuv. Oʻquv qoʻllanma. Samarqand. 2019. 16-b; Sangirova.Z. Tabiiy fanlarni oʻqitishda STEM taʼlimidan foydalanish. Science and innovation. International Scientific journal. UIF-2022 №4. <https://cyberleninka.ru/article/n/tabiiy-fanlar-ni-itishda-stem-talimi/viewer>. 345-b); Zoyirova, N. B., Boymatova, K. A., & Burkhanova M.G. (2022). Steam education methodology for preschool children's school preparation using digital technologies. Innovative Development in Educational Activities, 1(5), 238–242.; Orifjonova M.S. The role of clil in steam education in uzbekistan: bridging language and innovation for sustainable development. (2025). Образование наука и инновационные идеи в мире, 70(1), 3-6. <https://scientific-jl.com/obr/article/view/15052>; Miralimova M.Y., 2022. Integrating Steam in English Language Classrooms (K1-K2). International Journal on Integrated Education. 5, 2 (Feb. 2022), 140–144. DOI:<https://doi.org/10.31149/ijie.v5i2.2735>; Turdiyev Sh.R., STEAM fanlari taʼlimi va integratsiyasini yuzaga kelishi modeli. Academic Research in Educational Sciences. V. 3. Issue 4. 2022. <https://cyberleninka.ru/article/n/steam-fanlar-talimi-va-integratsiyasini-yuzaga-kelishi-modeli/viewer>; Elboyeva M.P. "STEAM" approach to studying Uzbek children's literature.(2023). European Journal of Humanities and Educational Advancements (Ejhea), 4 (4), 227-230.;

⁴ Попова И.А. Обучение иноязычному профессионально ориентированному чтению студентов-медиков. Дисс. канд. пед. наук. -Волгоград, 2005.–С.198.; Панкратова Е.Н. Обучение профессионально

Tadqiqotchilardan S.Krilova, V.Markova, Y.R.Shipulina va Y.A.Kuzminalarning tadqiqotlarida STEAM ta'lim texnologiyasi asosida ta'lim-tarbiya jarayonini tashkil etish, yuqori sinf o'quvchilarining umumta'limiy fanlarga bo'lgan qiziqishlarini STEAM ta'lim texnologiyasi asosida shakllantirish, o'quvchilarning ilmiy-tadqiqotchilik faoliyatini rivojlantirish masalalari keng yoritilgan⁵.

Xorijlik olimlardan J.C.Alderson, S.C.Thomas, W.Grabe va F.L.Stoller, Sh.Seymour, R.Beaugrand, W.Dressier va J.Grzesiklar tomonidan chet tilni o'qitishda o'qish kompetensiyasini rivojlantirishda ko'zda tutilgan maqsad va vazifalar, ingliz tilida o'qish malakalarini rivojlantirish mazmuni, shakli va vositalariga doir muammolar o'rganilgan⁶.

Tadqiqotchilardan G.Yakman, M.Sanders, J.Brainer, S.Harkness, K.Jonson, K.Kohler, S.A.Averin, W.H.Tan va R.Subramaniamlar tomonidan maktab o'quvchilarining umumta'limiy fanlarni uzviy (integratsion) o'rganishda STEAM ta'lim texnologiyasining o'rni va ahamiyati, mazkur ta'lim texnologiyasidan foydalangan holda umumta'limiy va tilga oid o'quv fanlarining o'qitish mazmuni, maqsadi, shakli, bosqichlari va vositalariga doir muammolar tadqiq qilingan⁷.

ориентированному чтению как когнитивно-информационной деятельности на 3-5 курсах неязыкового вуза (на материале английского языка).-Дисс. ...канд. пед. наук.-Н. Новгород: НГЛУ, 2006. –С.208.; Крылова С.А. Методика обучения профессионально ориентированному рефлексивному чтению студентов 1-2 курсов исторических специальностей педагогического вуза (на материале нем. яз.). -Дис. ...канд. пед. наук. -Н. Новгород: НГЛУ, 2008. -250 с.; Васкина Н.В. Обучение профессионально ориентированному чтению студентов неязыковых вузов на основе извлечения концепта текста (английский язык). Дис. ...канд. пед. наук. -Н. Новгород: НГЛУ, 2010. -187с.; Репкина Л.И. Профессионально ориентированному чтению текстов психолого-педагогической направленности на основе функционального подхода. Дис. ...канд. пед. наук. - Москва: 2011. –169 с.; Кузнецова Е.С. Развитие умения читать в системе профессиональной подготовки экономистов-аграрников (на материале английского языка). Дис. ...канд. пед. наук. - Елец: 2005. –168 с.; Ложкина Н.М. Формирование иноязычной читательской компетенции студентов экономических специальностей. Дис. ...канд. пед. наук. - Н. Новгород: 2011. –126 с.

⁵ Крылова С.А. Методика обучения профессионально ориентированному рефлексивному чтению студентов 1-2 курсов исторических специальностей педагогического вуза (на материале нем. яз.). -Дис. ...канд. пед. наук. -Н. Новгород: НГЛУ, 2008. -250 с.; Маркова А.К. Формирование мотивации учения в школьном возрасте: Пособие для учителя. –М.: Просвещение, 1983. – 96 с.; Шипулина.Е.Р.Формирование профессиональных компетенций будущих учителей на основе курса «STEM технологии в образовании» Магистерская диссертация. Екатеринбург 2020.С:107.; Кузьмина Ю.А.Формирование исследовательских умений у младших школьников в условиях STEM-образования.Россия. Тольятти 2018. -С.193.

⁶ Alderson, J. C. Assessing reading. –New York: Cambridge University Press, 2000. –398 p.; Thomas.S.C. Teaching Reading to English Language Learners: A reflective Guide. CA: Corwin Press. 2009.- 107 p.; Grabe W., Stoller F. L. Teaching and researching reading (2nd ed.). Great Britain: Pearson Education Limited. 2011. -324 p.; Seymour Sh. Essentials of Teaching Academic Reading: English for Academic Success. –Houghton Mufflin Company, 2006. –68 p.; Beaugrand R., Dressier W. Introduction to Text Linguistics. -London: Longman, 1994. -188 p.; Grzesik J. Textverstehen lernen und lehren. -Stuttgart: Klett, Verlag für Wissen und Bildung, 1990. -405 с.

⁷ Yakman G. STEAM–An Educational Framework to Relate Things To Each Other And Reality. K12 Digest February 02.2020. [https://steamedu.com/k12digest/Teaching STEM in the Secondary School, Helping teachers meet the challenge.](https://steamedu.com/k12digest/Teaching%20STEM%20in%20the%20Secondary%20School,%20Helping%20teachers%20meet%20the%20challenge.); Sanders M. (2009). Integrative STEM education: primer. The Technology Teacher, 68(4), 20-26.; Breiner J., Harkness S., Johnson C., Koehler C. What Is STEM? A Discussion About Conceptions of STEM in Education and Partnerships // School Science and Mathematics. 2012. doi: 10.1111/j.1949-8594.2011.00109.x.; Аверин С.А., Маркова В.А. Стем-технологии в образовании: мода или реальность // Ребенок в современном образовательном пространстве мегаполиса. М.: 2017. С. 193-202.; Rum Tan, Stem Education in Singapore: A complete guide for parents-2019.; Subramaniam. R. STEM sohasidagi hamkorlikning eng yaxshi tajribalari: Singapur tajribasi.

Biroq mamlakatimizda ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish malakalarini rivojlantirishning lingvistik, lingvometodik va lingvodidaktik muammolari chet til ta'limi sharoitidan kelib chiqqan holda tadqiq etilmagan. Bu o'z navbatida, mazkur yo'nalishda ingliz tilini STEAM ta'lim texnologiyasi asosida o'qish malakalarini rivojlantirishning ilmiy-nazariy va amaliy muammolarini tadqiq etishni taqozo etadi.

Tadqiqotning dissertatsiya bajarilgan oliy ta'lim muassasasining ilmiy-tadqiqot ishlari rejalari bilan bog'liqligi. Dissertatsiya Namangan davlat universiteti ilmiy-tadqiqot ishlari rejasining "O'zbek adabiyotining xorijda o'rganilishi va ingliz tili o'qitish muammolari" bandi doirasida bajarildi.

Tadqiqotning maqsadi ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish metodikasini takomillashtirishga doir taklif va tavsiyalar ishlab chiqishdan iborat.

Tadqiqotning vazifalari:

ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirishning lingvistik va lingvodidaktik tamoyillarini aniqlash;

ingliz tilida STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining o'qish malakalarini rivojlantirishga qaratilgan tayyorlov va nutqiy mashqlar tizimini ishlab chiqish;

ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'quvchilarning o'qish kompetensiyasini rivojlantirishni belgilovchi past, quyi, o'rta va yuqori darajalariga doir mezonlarni aniqlash;

ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirish metodikasini takomillashtirish.

Tadqiqotning obyekti sifatida ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini rivojlantirishda STEAM – ta'lim texnologiyasidan foydalanish jarayoni tanlab olingan.

Tadqiqotning predmetini ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini rivojlantirishda STEAM – ta'lim texnologiyasidan foydalanish mazmuni, shakl, metod va vositalari tashkil qiladi.

Tadqiqotning usullari. Tadqiqotda nazariy (qiyosiy, tahliliy), diagnostik (kuzatish, suhbat, so'rovnoma), pedagogik tajriba-sinov, matematik-statistik tahlil, umumlashtirish usullaridan foydalanildi.

Tadqiqotning ilmiy yangiligi quyidagilardan iborat:

ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirishning lingvistik (nutqiy yo'nalganlik, til tajribasini hisobga olish, nutq namunasi asosida til o'rgatish, til mashqlari va nutq amaliyoti birligi) va lingvodidaktik (faollik, ko'rgazmalilik va puxta o'zlashtirish) tamoyillari o'qish kompetensiyasini rivojlantirishga doir "So'rovga asoslangan ta'lim (Inquiry-based learning)", "Loyihaga asoslangan ta'lim (Project-based learning)" va "Muammoga asoslangan ta'lim (Problem-based learning)" kabi zamonaviy yondashuvlarni ingliz tili o'qitish jarayoniga integratsiyalash asosida nazariy va metodik jihatdan asoslab berilgan;

ingliz tilida STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining o'qish malakalarini rivojlantirishga qaratilgan til va nutqiy mashqlar tizimi vizual ijodkorlik (visual creativity), modellashtirish, tasniflash (classification), jamoa bo'lib ishlash (group-work), tanqidiy fikrlash (critical thinking) mashqlarini matnni o'qishning uch bosqichli tayyorlov (matn-oldi), mashq qilish (matn bilan ishlash) va qo'llash (matndan keyingi) bosqichlarida integratsiyalash asosida metodik ta'minoti ishlab chiqilgan;

ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'quvchilarning o'qish kompetensiyasini rivojlantirishni belgilovchi past, quyi, o'rta va yuqori darajalari chet tillarni bilishning umumiyevropa talablari B1 darajasida rivojlanganligini belgilovchi mezonlar tizimi bilan birga matnni oldindan fahmlash (antisipatsiya), mantiqiy tushunish va ichki nutqiy eshituv kabi psixo-fiziologik mexanizmalarni matn bilan ishlash bosqichlari, shuningdek, o'qishning tanishuv (fluently-reading), o'rganuv/mutolaa (close-reading) va kuzatuv (skimming-reading) turlari hamda o'qish texnikasi kabi mashqlarni o'zaro integratsiyalash asosida aniqlangan;

ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirish mazmuni o'qishga doir nutq mavzulari (Science, Technology, Engineering, Arts, Mathematics), til materialini hisoblangan leksika, grammatika va talaffuz birliklarini o'qishni o'rgatishning zamonaviy tamoyillari (Reading Strategies) aqliy hujm (brainstorming), insert, harakatli, didaktik va rolli o'yin texnologiyalari bilan o'zaro (internal) metodik ta'minoti ishlab chiqilgan.

Tadqiqotning amaliy natijalari quyidagilardan iborat:

ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlanganligini belgilovchi indikatorlarni "Chet tillarni bilishning umumiyevropa standartlari (CEFR)" asosida ishlab chiqilgan hamda chet til o'qitish amaliyotiga joriy etilgan;

ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini STEAM ta'lim texnologiyasi orqali rivojlantirishning lingvodidaktik tamoyillari bo'yicha yaratilgan lingvometodik materiallar mazmuni va ulardan foydalanish metodikasiga doir ilmiy-nazariy va amaliy xulosalar nashr etilgan ilmiy-metodik maqolalarda va "We learn STEAM through English (Ingliz tilini STEAM asosida o'rganamiz)" nomli o'quv-metodik qo'llanmasida bayon etilgan;

ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish uchun yaratilgan lingvometodik materiallardan foydalanishning samarali lingvotexnologiyasi takomillashtirilgan.

Tadqiqot natijalarining ishonchliligi muammoni metodologik, metodik, psixologik, pedagogik yondashuvlar va ingliz tilida o'qish kompetensiyasini kommunikativ, integrativ, kasbga yo'naltirilgan va kompetensiyaviy yondashuvlar asosida rivojlantirishga doir milliy tajriba, respublikamiz va chet ellik olimlar, shuningdek, yuqori sinf o'quvchilarining ingliz tilida o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishga doir o'quv faoliyatini tashkil etishga oid tavsiyalar ishlab chiqilganligi, tahlillarning miqdor hamda sifat

jihtadan ta'minlanganligi, tajriba-sinov ishlarining haqqoniyligi, olingan natijalarning matematik-statistik tahlil metodlari yordamida qayta ishlanganligi, qo'llanilgan yondashuvlarning ilmiy-metodik jihatdan asoslanganligi, xulosa, taklif va tavsiyalarning amaliyotga joriy etilganligi bilan belgilanadi.

Tadqiqotning ilmiy va amaliy ahamiyati. Tadqiqot natijalarining ilmiy ahamiyati yuqori sinf o'quvchilarining ingliz tilida o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishning mazmun-mohiyati yoritilganligi, ingliz tilida o'qishni o'rgatishning lingvistik va nutqiy kompetensiyalarni rivojlantirishdagi o'rni va ahamiyatining o'ziga xos pedagogik hamda metodik xususiyatlarini belgilab berilganligi, muammoning o'rganishga doir lingvodidaktik yondashuvlarning tahlil etilganligi bilan izohlanadi.

Tadqiqot natijalarining amaliy ahamiyati yuqori sinf o'quvchilarining o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishga mo'ljallangan mashq va topshiriqlarga asoslangan "We learn STEAM through English (Ingliz tilini STEAM asosida o'rganamiz)" o'quv-metodik qo'llanmani amaliyotga joriy etilganligi, ingliz tilida matnlarni STEAM ta'lim texnologiyasi asosida o'qishni o'rgatish texnologiyasi o'qitish metodikasi sohasida ushbu fanning yanada takomillashuviga xizmat qilganligi bilan belgilanadi.

Tadqiqot natijalarining joriy qilinishi. Ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishga doir ishlab chiqilgan takliflar asosida:

ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirishning lingvistik (nutqiy yo'nalganlik, til tajribasini hisobga olish, nutq namunasi asosida til o'rgatish, til mashqlari va nutq amaliyoti birligi) va lingvodidaktik (faollik, ko'rgazmalilik va puxta o'zlashtirish) tamoyillari o'qish kompetensiyasini rivojlantirishga doir "So'rovga asoslangan ta'lim (Inquiry-based learning)", "Loyihaga asoslangan ta'lim (Project-based learning)" va "Muammoga asoslangan ta'lim (Problem-based learning)" kabi zamonaviy yondashuvlarni ingliz tili o'qitish jarayoniga integratsiyalash asosida nazariy va metodik jihatdan asoslab berishga doir ilmiy nazariy asoslangan takliflaridan 2023-2024-yillarda Namangan davlat chet tillari institutida bajarilgan "Erasmus+Capacity Building Project 101129076 Empower: Women Entrepreneurship, Empowerment, employability and self-confidence" loyihasining ta'limiy va madaniy sohadagi tadbirlar va amaliy ishlarida foydalanilgan (Namangan davlat chet tillari institutining 2025-yil 5-iyundagi 1282-03-sonli ma'lumotnomasi). Natijada, o'quvchilarning ingliz tilida o'qish kompetensiyasini rivojlantirishga qaratilgan mashqlar majmui va metodik tavsiyalari ta'lim sifatini oshirishga xizmat qilgan;

ingliz tilida STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining o'qish malakalarini rivojlantirishga qaratilgan til va nutqiy mashqlar tizimi vizual ijodkorlik (visual creativity), modellashtirish, tasniflash (classification), jamoa bo'lib ishlash (group-work), tanqidiy fikrlash (critical thinking) mashqlarini matnni o'qishning uch bosqichli tayyorlov (matn-oldi), mashq qilish (matn bilan ishlash) va qo'llash (matndan keyingi) bosqichlarida

integratsiyalash asosida metodik ta'minotini ishlab chiqishga doir xulosa va takliflardan O'zbekiston Milliy teleradiokompaniyasi "O'zbekiston" teleradiokanali DMning madaniy-ma'rifiy va badiiy eshittirishlar muharririyatining efirga uzatilgan "Ta'lim va taraqqiyot", "Bolalar va biz" nomli dasturlarining 2024-yilning mart va may oylarida efirga uzatilgan ssenariylarini tayyorlashda foydalanildi. (O'zbekiston Milliy teleradiokompaniyasi "O'zbekiston" teleradiokanali DMning 2024-yil 27-maydagi 04-36-677-sonli ma'lumotnomasi). Natijada, STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining ingliz tilida o'qish kompetensiyasini rivojlantirish texnologiyasi ommalashtirilgan;

ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'quvchilarning o'qish kompetensiyasini rivojlantirishni belgilovchi past, quyi, o'rta va yuqori darajalari chet tillarni bilishning umumevropa talablari B1 darajasida rivojlanganligini belgilovchi mezonlar tizimi bilan birga matnni oldindan fahmlash (antisipatsiya), mantiqiy tushunish va ichki nutqiy eshituv kabi psixo-fiziologik mexanizmalarni matn bilan ishlash bosqichlari, shuningdek, o'qishning tanishuv (fluently-reading), o'rganuv/mutolaa (close-reading) va kuzatuv (skimming-reading) turlari hamda o'qish texnikasi kabi mashqlarni o'zaro integratsiyalash asosida aniqlashga doir amaliy takliflardan "We learn STEAM through English (Ingliz tilini STEAM asosida o'rganamiz)" nomli o'quv-metodik qo'llanmasini tayyorlashda foydalanilgan (O'zbekiston Respublikasi Maktabgacha va maktab ta'limi vazirligi huzuridagi Respublika ta'lim markazining 2025-yil 4-iyundagi 01/11-6-366-son ma'lumotnomasi). Natijada, STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining ingliz tilida o'qish kompetensiyasini rivojlantirishning metodik ta'minoti yaratilgan;

ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirish mazmuni o'qishga doir nutq mavzulari (Science, Technology, Engineering, Arts, Mathematics), til materialini hisoblangan leksika, grammatika va talaffuz birliklarini o'qishni o'rgatishning zamonaviy tamoyillari (Reading Strategies) aqliy hujm (brainstorming), insert, harakatli, didaktik va rolli o'yin texnologiyalari bilan o'zaro (internal) metodik ta'minotini modernizatsiya qilishga mo'ljallangan mashqlardan yuqori sinf ingliz tili darslarida foydalanilgan (O'zbekiston Respublikasi Maktabgacha va maktab ta'limi vazirligi huzuridagi Respublika ta'lim markazining 2025-yil 4-iyundagi 01/11-6-366-son ma'lumotnomasi). Natijada, STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining ingliz tilida o'qish kompetensiyasini rivojlantirishning amaliy ahamiyati darajasini oshirishga erishildi.

Tadqiqot natijalarining aprobatsiyasi. Mazkur tadqiqot natijalari 5 ta xalqaro va 2 ta respublika miqyosida ilmiy-amaliy anjumanlarda muhokamadan o'tkazilgan.

Tadqiqot natijalarining e'lon qilinganligi. Dissertatsiya mavzusi bo'yicha jami 15 ta ilmiy-metodik ishlar, O'zbekiston Respublikasi Oliy attestatsiya komissiyasining doktorlik dissertatsiyalari asosiy ilmiy natijalarini chop etish uchun tavsiya etilgan ilmiy nashrlarda 8 ta maqola, shundan 6 tasi respublika va 2 tasi xorijiy jurnallarda chop etilgan.

Dissertatsiyaning tuzilishi va hajmi. Dissertatsiya kirish, uch bob, xulosa va tavsiyalar, foydalanilgan adabiyotlar ro'yxati va ilovalardan iborat bo'lib, umumiy hajmi 141 betni tashkil etadi.

DISSERTATSIYANING ASOSIY MAZMUNI

Kirish qismida tadqiqot mavzusining dolzarbligi asoslangan, tadqiqotning maqsadi va vazifalari, obykti va predmeti tavsiflangan, respublika fan va texnologiyalarni rivojlantirishning ustuvor yo'nalishlariga mosligi ko'rsatilgan, tadqiqotning ilmiy yangiligi, amaliy natijalari bayon qilingan, olingan natijalarning ishonchliligi, ilmiy va amaliy ahamiyati ochib berilgan, tadqiqot natijalarining amaliyotga joriy qilinishi, nashr qilingan ishlar va dissertatsiyaning tuzilishi bo'yicha ma'lumotlar keltirilgan.

Dissertatsiyaning **“Yuqori sinf o'quvchilarning ingliz tilida o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishning ilmiy-nazariy asoslari”** nomli birinchi bobida yuqori sinf ingliz tili darslarda STEAM ta'lim texnologiyasidan foydalanish dolzarb pedagogik muammo sifatida hamda STEAM ta'lim texnologiyasi asosida o'quvchilarning o'qish kompetensiyasini rivojlantirishning metodik sharhi, mazmuni va mohiyati yoritib berilgan.

Mazkur bobda “STEAM”, “kompetensiya” va “o'qish kompetensiyasi” atamalarining mazmuni hamda ular o'rtasidagi bog'lanish talqin etilgan. STEAM ta'lim texnologiyasi – XXI asr qobiliyatlarini shakllantirish uchun xizmat qiladigan, an'anaviy ta'lim tizimidan tubdan farq qiladigan, hayotiy bilimlarni egallashga qaratilgan tabiiy, texnologiya, muhandislik, san'at va matematika fanlar tuzilmasidan tarkib topgan zamonaviy integratsion yondashuvdir.

Mazkur ta'lim texnologiyasi tanqidiy fikrlash, jamoa bo'lib ishlash, muloqotchanlik, mantiqiy fikrlash va yaratuvchanlik qobiliyatlarini rivojlantirish vositasi sifatida bir necha fan tarmoqlarini rivojlantirgan zamonaviy ta'lim texnologiyasidir. STEAM ta'lim texnologiyasi integratsion yondashuv asosida o'quvchilarning ilmiy-tadqiqot, texnik ijodkorlik va loyiha faoliyatiga yo'naltiruvchi maxsus ta'lim muhitini talqin qilishda o'z aksini topadi.

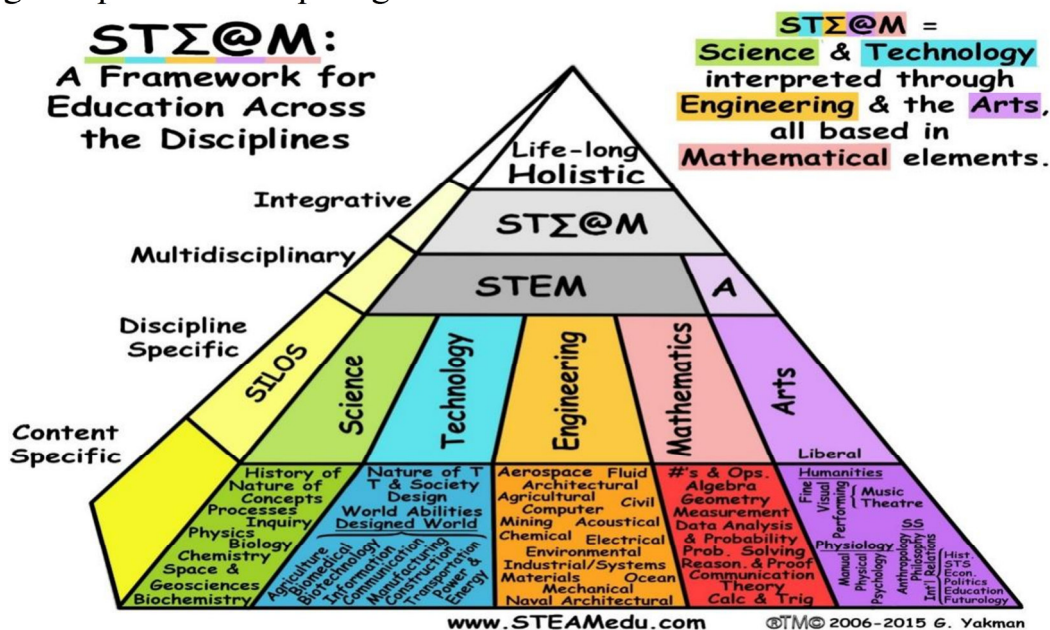
Tadqiqotchilardan G.Yakman mazkur texnologiyaga “STEAM ta'limi - muhandislik va san'at sohalari orqali talqin etiluvchi texnologiya hamda ilm-fan majmuidir. Shuningdek, bu sohalarning barchasi matematik elementlarga asoslangan holda o'rganiladi” deya ta'rif beradi.

Tadqiqotchi Y.A.Kuzmina ta'rifiga ko'ra “STEM ta'lim texnologiyasi – bu ta'lim beruvchining uslubiy yo'nalishi bo'lib, u talabaning muhandislik tafakkurini shakllantirish uchun olingan bilimlarni amalda qo'llash orqali bir qator fizika, matematika va tabiatshunoslik elementlarini bolaning o'quv faoliyatiga birlashtirishni ta'minlaydi”.

STEAM – ta'lim texnologiyasining tahlili asosida uning turli sohalarga yo'naltirilganligini ifodalovchi, STEAM nazariyotchisi G.Yakman tomonidan yaratilgan “STEAM logotipi” aniqlandi va tahlilga tortildi (*1-rasmga qarang*).

Ushbu logotipda har bir fanning asosiy mazmuni aks ettiriladi. Tadqiqotchi G.Yakman “Bugungi kunda san'at va matematika sohalarni tushunmay turib muhandislik sohasida muvaffaqiyatga erishib bo'lmaydigan hamda texnologiyasiz

ilm-fanni tushunib bo‘lmaydigan bir olamda yashayapmiz” deya STEAM fanlari orasidagi aloqadorlikni talqin etgan.



1-rasm. Tadqiqotchi G.Yakman tomonidan yaratilgan STEAM logotipi

STEAM ta’lim texnologiyasi paydo bo‘lishi uzoq muddatli jarayon hisoblanib, barcha sabablari xronologik ketma-ketlikda keltirib o‘tilgan hamda bugungi kungacha dunyo mamlakatlari tomonidan STEAM ta’lim texnologiyasining turli ko‘rinishlari o‘rganib chiqilgan va jadval ko‘rinishida ifoda etilgan (1-jadvalga qarang).

1-jadval

STEAM ta’lim texnologiyasiining turlicha ko‘rinishlari

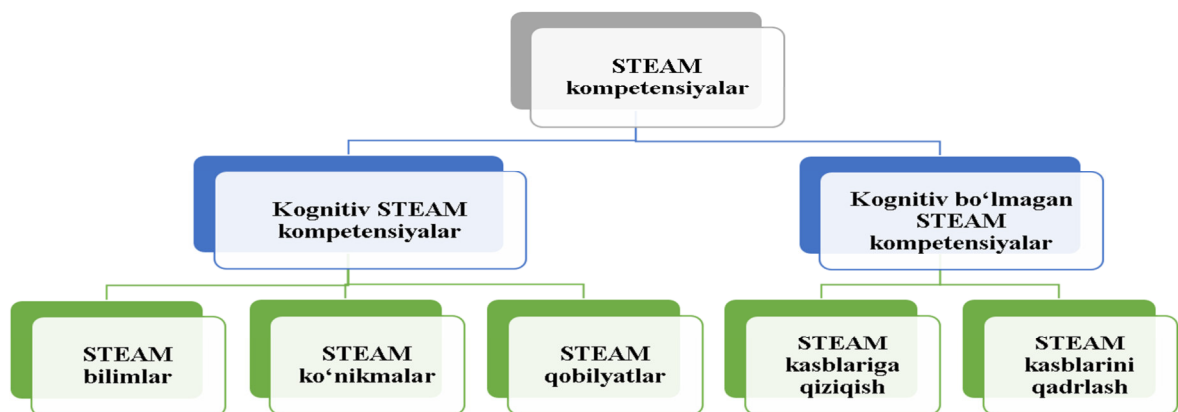
№	Qisqartma nomi	Ingliz tilida kengaytirma nomi	O‘zbekcha tasnifi
1.	STEM	Science, Technology, Engineering, Mathematics	Tabiiy fanlar, texnologiya, muhandislik va matematika fanlarini birlashtirib o‘qishga yo‘naltirilgan yondashuv.
2.	MINT	Mathematics, Informatics, Natural sciences, Technology	Germaniya ta’lim dasturida matematika, informatika, tabiiy fanlar va texnologiyani birgalikda o‘qitish maqsadida yaratilgan yondashuv.
3.	STEAM	Science, Technology, Engineering, Arts, Mathematics	Hozirgi kunda keng qo‘llanilayotgan fan, texnologiya, muhandislik, san’at fanlarini birlashtirib o‘qitishga mo‘ljallangan ta’lim texnologiyasi.
4.	STEMM	Science, Technology, Engineering, Mathematics, Medicine	Ta’lim oluvchilarga fan, texnologiya, muhandislik, matematika va tibbiyot fanlarini mujassamlashtirgan holda o‘qitish.

5.	STREAM	Science, Technology, Reading+Writing Engineering, Arts, Mathematics	O‘qish va yozish orqali fan, texnologiya, muhandislik, san’at va matematika fanlarini hamkorlikda o‘rgatishga asoslangan ta’lim texnologiyasi.
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Ingliz tili STEAM fanlariga katta ta’sir ko‘rsatadi, chunki ingliz tili atrofimizdagi borliqni tushunish va anglashga asoslangan. STEAM ta’limida ingliz tilini o‘qitish naqadar muhim ekanligini quyidagi omillarda ko‘ramiz: 1. Barcha STEAM sohasiga oid fiklar, konseptlar, yangiliklar til orqali ifoda etiladi. Misol uchun, matematik tenglamani olaylik. Matematik tenglama doimo real-hayot bilan bog‘liq bo‘ladi hamda albatta uni so‘z orqali ifoda etish kerak; 2. Ta’limga oid matnlar, tadqiqot jurnallari hamda boshqa manbalarni o‘qib tushunish uchun Advanced (yuqori) ingliz tili darajasida bo‘lish talab qilinadi; 3. STEAM ta’lim oluvchilari ingliz tili ko‘nikmalarini yaxshi egallamasdan turib mavjud dalillarni talqin etisholmaydi va fan haqidagi fikrlarini so‘z orqali ifodalab berisholmaydi. Kelajakda STEAM sohasi muvaffaqiyatlari haqida tinglamoqchi bo‘lsak, avvalambor biz ularni ifodalash uchun zarur bo‘ladigan so‘zlarni (ya’ni ingliz tilini) rivojlantirishimiz kerak

Mazkur bobda “kompetensiya” atamasi atroflicha tahlilga tortilgan. O‘zbek tilining izohli lug‘atida kompetensiya terminiga quyidagicha izoh beriladi: “Kompetensiya – lotincha **competere** layoqatli, munosib bo‘lmoq ma’nosini beradi; muayyan organ yoki mansabdor shaxsning rasmiy hujjatlarda belgilangan vakolatlar doirasi; shaxsning biror bir sohadan xabardorlik yoki shu sohani bilish darajasi”. “Kompetensiya – so‘zi lotinchadan olingan bo‘lib erishyapman, munosibman, loyiqman degan ma’nolarni anglatadi. Kompetensiya atamasi shuningdek u yoki bu sohadagi bilimlar yoki tajribalar, shuningdek shaxsning biror bir sohadan xabardorligi, shu sohani bilish darajasini bildiradi”.

Tadqiqot davomida “STEAM kompetensiyalar” tushunchasi ham atroflicha tahlilga tortilgan. UNESCO tomonidan berilgan ma’lumotlarga ko‘ra, STEAM kompetensiya – bu insonlarning STEAM fanlari bo‘yicha egallagan ko‘nikmalarini kundalik hayot tarzi, ish joyi yoki ta’lim jarayonlarida to‘g‘ri qo‘llay olish qobiliyatidir. Tegishli adabiyotlar tahlili natijasi o‘laroq, STEAM kompetensiyalar komponentlari jadval holiga keltirildi (*2-rasmga qarang*).



2-rasm. STEAM kompetensiyalarining tarkibiy qismlari

Tadqiqotimiz asosiy tushunchasi hisoblangan “o‘qish” kompetensiyasi, nutqiy kompetensiyaning to‘rt: o‘qish (reading), tinglab tushunish (listening), yozish (writing) hamda gapirish (speaking) komponentidan biri sifatida tahlilga tortilgan.

O‘zbek tilining izohli lug‘atida o‘qish atamasiga quyidagicha ta’rif keltiriladi: “o‘qish – so‘z, jumla, gap, matn va shu kabilarning yozma shaklini ichida yoki og‘zaki ifodalamoq”. O‘qish tushunchasini kengroq ma’noda talqin etgan ta’limshunoslar unga: “grafik koddagi axborotni butunlay farq qiladigan kodga (ya’ni tovush kodiga) o‘tkazish jarayonidir” deya ta’rif berishadi.

O‘quvchilarga o‘qish asosan ikki xil maqsadda birinchisi, mazmun (matn nima haqida ekanligi) va ikkinchisi jarayon (ichida yoki tovush chiqarib o‘qish) o‘rgatiladi. Axborotni (mazmunni) yozma matndan olishga qaratilgan nutq faoliyatining turiga o‘qish deyiladi. Matndagi axborotni ikki xil usulda ya’ni ichida (ovoz chiqarmay) o‘qish orqali hamda ma’lumotni o‘zgalarga yetkazish maqsadida ovoz chiqarib o‘qish orqali amalga oshiriladi. Tadqiqot davomida o‘qish turlari: tanishuv (reading for gist), o‘rganuv (reading to extract detailed information), kuzatuv (reading to extract specific information) hamda o‘qish bosqichlari man o‘qishdan oldingi (pre-reading), matnni o‘qish (post-reading), matn o‘qilgandan keyingi (post-reading) singari bosqichlarda o‘rgatiladi.

Ushbu bobda shuningdek, ingliz tili o‘qitish maqsadlari (aims/goals): amaliy (practical), ta’limiy (educational), tarbiyaviy (cultural) va rivojlantiruvchi (developmental) turlari mavzu doirasida tahlil etilgan. Mazkur maqsadlarni chet til o‘qitish tizimida muvaffaqiyatli amalga oshirishda yuqori sinf o‘quvchilariga ingliz tilidagi to‘rt muhim nutqiy faoliyat turlari: o‘qish (Reading), tinglab tushunish (Listening), yozish (Writing), gapirishni (Speaking) B1 darajada o‘zlashtirishda bilim, ko‘nikma va malakalarga ega bo‘lish vazifasini qo‘yadi.

Dissertatsiyaning **“Yuqori sinflarda STEAM ta’lim texnologiyasi asosida o‘quvchilarning ingliz tilida o‘qish kompetensiyasini rivojlantirish metodikasi”** nomli ikkinchi bobida ingliz tili darslarida o‘quvchilarning o‘qish kompetensiyasini STEAM ta’lim texnologiyasi orqali rivojlantirish metodikasi ishlab chiqilganligi, ingliz tili darslarida o‘qishni o‘rgatishning uch bosqichi hamda bu bosqichlarda STEAM integratsiya qilingan mashqlardan foydalanish samaradorligi ilmiy-metodik jihatdan asoslangan.

Ingliz tili darslarida matn bilan ishlashning uch bosqichi: matn o‘qishdan oldingi bosqich (pre-reading), matnni o‘qish bosqichi (while-reading) va matn o‘qilgandan keying bosqichlaridan foydalanish matnni o‘qib tushunish, matndan olib qolingani yangi axborotni eslab qolish, matndagi yangi leksik va grammatik birliklarni muloqotda qo‘llash imkoniyatini oshiradi. Matn bilan ishlashning ushbu bosqichlarini yuqori sinf ingliz tili darslariga STEAM integratsiya qilingan mashqlar bilan hamkorlikda qo‘llash ta’lim oluvchilarda nutqiy faoliyat turlari rivojlanishi bilan bir qatorda ularda tanqidiy fikrlash, yaratuvchanlik, muloqotchanlik, mantiqiy fikrlash, jamoa bo‘lib ishlash singari qobiliyatlarni rivojlantirish hamda olingan bilimlarni amaliyotda qo‘llash imkonini beradi. Shuningdek, STEAM fanlar tarmog‘iga oid matnlar bilan ishlash o‘quvchilarda

sohaviy leksika bilan tanishish, natijada kelajak kasblariga qiziqish ortishiga sabab bo'ladi. Tadqiqot ishida mazkur jarayon ilmiy-nazariy jihatdan tadqiq etildi.

Nutq ko'nikmalarini shakllantirish, odatda, bilimni o'zlashtirishdan boshlanib, amaliy ko'nikma va malakagacha bo'lgan bosqichlarni qamrab oladi. Bu jarayon psixolingvistikada ta'riflangan nutq faoliyatining uch asosiy bosqichi – nutqiy birliklarni vizual (ko'z bilan) idrok etish, ularni nutqiy harakatga aylantirish va ma'noga ishlov berish orqali amalga oshadi. STEAM ta'lim texnologiyasi asosida olib boriladigan darslar ushbu bosqichlarni mazmun bilan boyitib, o'quvchilarda yuqori darajadagi bilish va muloqot ehtiyojini yuzaga keltiradi.

Nutq faoliyatini boshlovchi asosiy omil motivatsiya hisoblanadi. STEAM yo'nalishidagi darslar o'quvchilarda ichki motivatsiya – qiziqish, bilish istagi, ilmga intilish tuyg'usini yuzaga keltiradi. Shuningdek, o'qituvchining tashqi turtkilari – savollar, bahslar, loyihalar orqali o'quvchilarning ishtirokini kuchaytiradi, ularni faol muloqotga jalb etadi.

Didaktika nuqtayi nazaridan, STEAM mazmunidagi matnlar o'quvchini axborot izlash, tahlil qilish, tushunganini ifoda qilish kabi bilim faoliyatiga yetaklaydi. Masalan, ekologik muammolar haqida o'qish, yangi texnologiyalar to'g'risida gapirish yoki ilmiy tajriba natijalari asosida maqola yozish kabi vazifalar nutq faoliyatini rivojlantirishda muhim ahamiyatga ega bo'ladi.

Yuqori sinflarda chet til o'qitishda o'qish faoliyati nafaqat amaliy, balki ta'limiy, tarbiyaviy va rivojlantiruvchi maqsadlarga xizmat qilishi bilan ajralib turadi. O'quv matnlarining semantik, grammatik va stilistik murakkabligi o'sib borishi o'quvchilardan tahliliy va sintetik fikrlashni talab etadi. Bu jarayon STEAM ta'lim yondashuvi bilan uyg'unlashganda, o'quvchilarning nafaqat til o'rganish, balki ilmiy asosda muammoni hal etish, yaratish, izohlash va muloqotda qatnashish kompetensiyalari rivojlanadi.

STEAM ta'lim texnologiyasi asosida ishlab chiqilgan o'qish topshiriqlari matnlarni o'qish orqali axborotni qabul qilish, uni tahlil qilish va tegishli kontekstda qayta ifodalashni ko'zda tutadi. Ayniqsa, ilmiy-ommabop, texnik, san'at va ijtimoiy hayotga oid matnlarni o'rganish orqali o'quvchi real hayotdagi bilimlarni ingliz tilida anglay boshlaydi. Bu esa ularni og'zaki nutqqa tayyorlashda muhim poydevor yaratadi. Tadqiqot davomida nutqiy faoliyat turlari hamda STEAM texnologiyasini integratsiya qilish asosida ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'quvchilarning o'qish kompetensiyasini rivojlantirish orqali ularning kommunikativ nutqiy muloqot kompetensiyasini rivojlanganlik darajasini xalqaro Umumyevropa standartining (CEFR) B1 darajasida rivojlantirish masalasi ko'rib chiqilgan.

STEAM ta'lim texnologiyasini ta'lim jarayonlariga tatbiq etishda bir qator tamoyillarga asoslaniladi. Mazkur tamoyillar tadqiqot davomida aynan ingliz tili darslarida STEAM texnologiyasidan foydalanish jarayonlari bilan birgalikda tahlil etilgan (2-jadvalga qarang).

STEAM tamoyillari

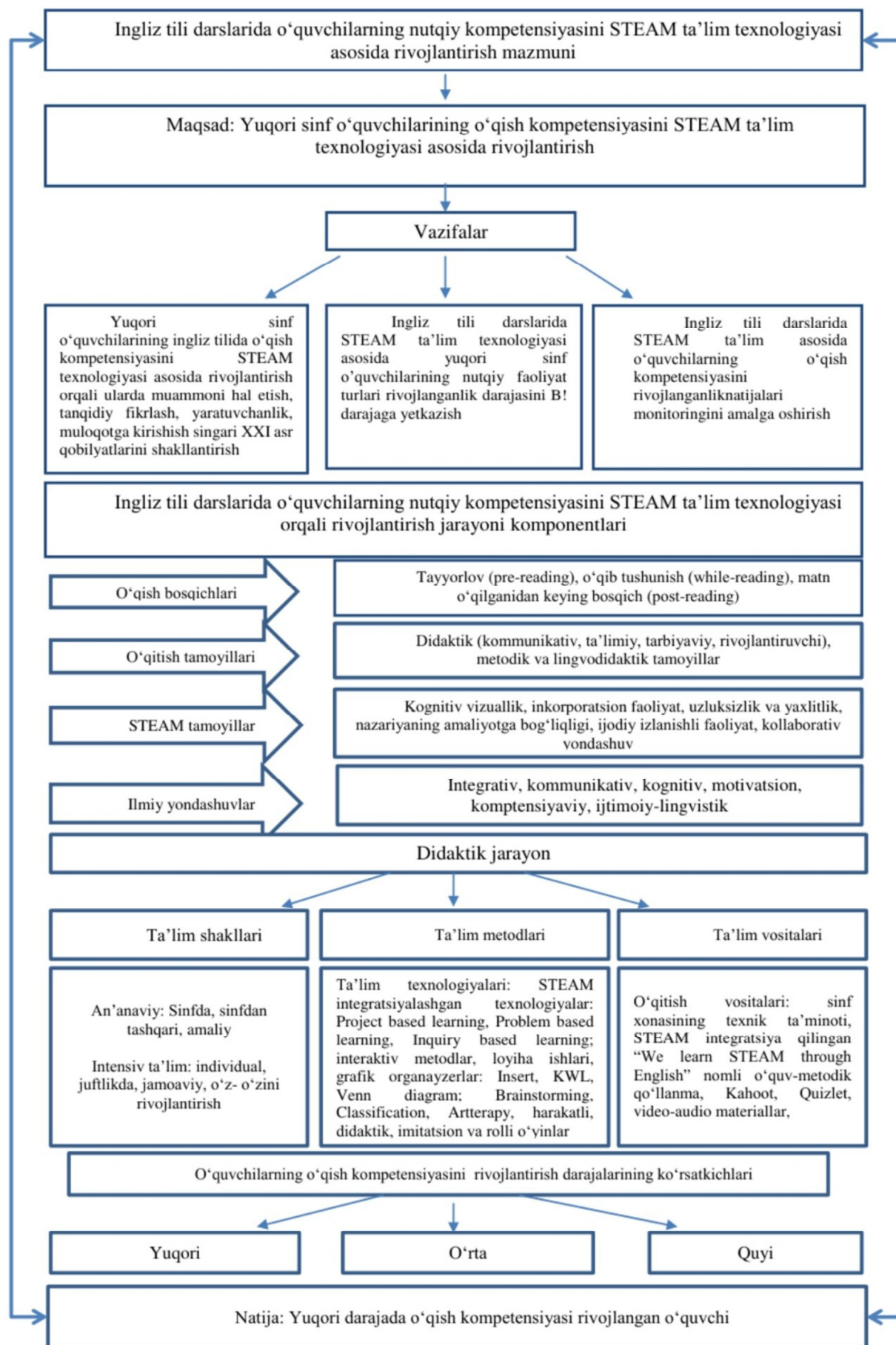
STEAM tamoyillari	Uzluksizlik va yaxlitlilik tamoyili
	Ilmiy asoslanganlik tamoyili
	Integratsion yondashuv tamoyili
	Ta'lim mazmunining insonparvarligi tamoyili
	Nazariyaning amaliyotga bog'liqligi tamoyili
	Kognitiv-vizuallik tamoyili
	Erkin faoliyatli yondashuv tamoyili
	Sinergetik faoliyat tamoyili
	Inkorporatsion faoliyat tamoyili
	Ijodiy izlanishli faoliyat tamoyili
	Kollobaratsion yondashuv tamoyili

Mazkur tamoyillar asosida yaratilgan metodik materiallardan yuqori sinf ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini rivojlantirish maqsadida samarali foydalanildi. Ushbu jarayonda o'quvchilarning ta'lim olishi uchun yaratilgan sharoit, darsning o'quv maqsadlari hamda ingliz tili o'qitish tamoyillariga muvofiq amaliyotda innovatsion yondashuvlar qo'llanildi.

Ingliz tili darslarida yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirishning lingvistik tamoyillari – nutqiy yo'nalganlik, til materialini chegaralab o'rgatish, til tajribasini hisobga olish, nutq namunasi asosida til o'rgatish, til mashqlari va nutq amaliyoti birligi, nutq faoliyati turlarini uzviy o'rgatish, og'zaki nutqni ilgariyasi – kabi tamoyillari, shuningdek, lingvodidaktik tamoyillar hisoblangan – faollik, ko'rgazmalilik, puxta o'zlashtirish, tabaqalashtirilgan yondashuv, oson va qiyinlik tamoyillarini o'qish kompetensiyasini rivojlantirishga doir “So'rovga asoslangan ta'lim (Inquiry-based learning)”, “Loyihaga asoslangan ta'lim (Project-based learning)” va “Muammoga asoslangan ta'lim (Problem-based learning)” kabi zamonaviy yondashuvlarni ingliz tili o'qitish jarayoniga integratsiyalash asosida aniqlangan. Mazkur ta'limiy yondashuvlarning mazmuni, ingliz tili darslarida, xususan, STEAM ta'lim texnologiyasi orqali o'quvchilarning o'qish kompetensiyasini rivojlantirishda qo'llanishi bo'yicha ko'rsatmalar berib o'tilgan.

Ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM talim texnologiyasi asosida rivojlantirishga mo'ljallangan dars ishlanmalaridan namunalar keltirildi. Shuningdek, tadqiqot ishida ingliz tili darslarida yuqori sinf o'quvchilarning STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirish mazmuni (English teaching content) ingliz tilini o'qitish tamoyillarini (Reading Strategies) zamonaviy talablar asosida ilmiy-metodik jihatdan tahlil qilish kabi bosqichlarni aqliy hujum (brainstorming), insert, klaster (cluster), aql xaritasi (mind mapping), art texnologiya, harakatli, didaktik va o'yin texnologiyalari bilan o'zaro (internal) integratsiyasini ta'minlash yuzasidan tavsiyalar berib o'tildi.

Tadqiqot doirasida ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish modeli ishlab chiqildi (*3-rasmga qarang*).



3-rasm. Ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishning lingvometodik modeli

Ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish modelning maqsadi etib belgilangan. Mazkur maqsadga erishish uchun quyidagi vazifalar aniqlashtirildi: 1. Yuqori sinf o'quvchilarining ingliz tilida o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish orqali ularda muamoni hal etish, tanqidiy fikrlash, yaratuvchanlik, muloqotchanlik singari XXI asr qobiliyatlarini shakllantirish; 2. Ingliz tili darslarida STEAM ta'lim texnologiyasi asosida yuqori sinf o'quvchilarining nutqiy faoliyat turlari rivojlanganlik darajasini B1 darajaga yetkazish; 3. Ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'quvchilarning o'qish kompetensiyasi rivojlanganlik natijalari monitoringini o'tkazish.

Ingliz tili darslarida o'quvchilarning o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish komponentlari sifatida o'qish bosqichlari, o'qitish tamoyillari, STEAM tamoyillar hamda ilmiy yondashuvlar tanlandi. Mazkur komponentlar ham o'z o'rnida bir necha komponentlarni o'z ichiga oladi. O'qish bosqichlari uch turga: matn bilan ishlashdan oldin (pre-reading), matn bilan ishlash (while-reading) hamda matn o'qilgandan keyingi bosqich (post-reading) kabi bosqichlarga bo'linadi. O'qitish tamoyillari didaktik (kommunikativ, ta'limiy, tarbiyaviy, rivojlantiruvchi), metodik va lingvodidaktik tamoyillarni o'z ichiga oladi. STEAM tamoyillari esa uzluksizlik va yaxlitlik, ilmiy asoslanganlik, integratsion yondashuv, ta'lim mazmunining insonparvarligi, nazariyaning amaliyotga bog'liqligi, kognitiv-vizuallik, erkin faoliyatli yondashuv, sinergetik faoliyat, inkorporatsion faoliyat, ijodiy izlanishli faoliyat, kolloboratsion yondashuv singari tamoyillarni o'z ichiga oladi. Shuningdek, modelda didaktik jarayonni tashkil etuvchi ta'lim shakllari, ta'lim metodlari va ta'lim vositalari ko'rsatib o'tildi.

Tadqiqotning **“Yuqori sinflarda STEAM ta'lim texnologiyasi asosida o'quvchilarning ingliz tilida o'qish kompetensiyasini rivojlantirish bo'yicha tajriba-sinov ishlari”** deb nomlangan uchinchi bobida tajriba-sinov ishlarining maqsad va vazifalari, tajriba-sinov natijalarining miqdor va sifat ko'rsatkichlari hamda statistik tahlili masalalariga bag'ishlangan.

Tajriba-sinov ishlari uchun Andijon viloyati, Baliqchi tumani, 34-50-sonli umumta'lim maktablari, Farg'ona viloyati, Yozyovon tumani 6-7-sonli umumta'lim maktablari hamda Namangan viloyati, Namangan tumani 20-22-sonli maktablarida o'tkazildi. Tajriba davomida jami 842 nafar o'quvchilar respondentlar sifatida ishtirok etdilar. Tajriba-sinov ishlari 2022-2025-yillarda amalga oshirildi. Tajriba-sinov ishlari uch bosqichda amalga oshirildi:

1. Aniqlovchi tajriba bosqichi (2022-2023-yillar). Bu davrda chet til o'qitish metodikasi, xususan, ingliz tili o'qitish metodikasiga mo'ljallangan metodik qo'llanmalar, ta'lim jarayonlariga STEAM ta'lim texnologiyasini joriy etishga asoslangan tadqiqot ishlari, asosiy tushunchalar mazmuni hamda sohaga oid internet materiallari o'rganildi. Shu bilan birga mavzu doirasida o'quv-me'yoriy hujjatlar mazmuni tahlil qilindi. Mazkur muammoning amaliyotdagi holatini

aniqlash maqsadida respublikamizda hamda xorijiy davlatlarda yuqori sinflarda ingliz tili o‘qitish jarayonlari tahlil qilindi.

2. Shakllantiruvchi tajriba bosqichi (2023-2024-yillar). Ingliz tili darslarida yuqori sinf o‘quvchilarining o‘qish kompetensiyasini STEAM ta’lim texnologiyasi orqali rivojlantirishning metodik tizimi modeliga asosan faoliyat bosqichlari, ijodiy faoliyat ko‘nikmasi hamda STEAM ta’lim texnologiyasi asosida o‘qish savodxonligini rivojlantirishga xizmat qiluvchi metodlar aniqlashtirildi. Bunda o‘qituvchi va o‘quvchilar faoliyati pedagogik kuzatish, suhbat, munozara, pedagogik ta’sir etish, trening, test kabi an’anaviy metodlar, interfaol metodlar, o‘yin, muammoli, art va axborot texnologiyalari yordamida ularda ijodiy faoliyat ko‘nikmasini shakllantirish va rivojlantirishga e’tibor qaratildi. Tajriba guruhida darslar STEAM ta’lim texnologiyasi asosida olib borilib, mazkur darslarda ko‘plab innovatsion texnologiyalar uyg‘unlashgan holda qo‘llanildi. Tajriba guruhlarida “We learn STEAM through English” maxsus o‘quv-metodik ta’minot asosida ta’lim jarayonlari tashkil etilgan bo‘lsa, nazorat guruhlarida an’anaviy tarzda dars mashg‘ulotlari va o‘quv-tarbiya ishlari olib borildi. STEAM ta’lim texnologiyasi asosida olib borilgan darslarda nafaqat ingliz tili balki boshqa STEAM fanlariga bo‘lgan qiziqish, mustaqil fikr yuritish samaradorligi, muammoni hal etish, tanqidiy fikrlash, ijodkorlik, jamoa bo‘lib ishlash qobiliyatlari tez sur’atlarda o‘sib borishi kuzatildi.

3. Ta’kidlovchi tajriba sinov bosqichi (2024-2025-yillar). Yuqori sinflarda ingliz tili darslarida STEAM ta’lim texnologiyasi asosida o‘quvchilarning o‘qish kompetensiyasini rivojlantirish pedagogik modeliga asoslanib tanlab olingan shakl, metod va vositalarni qo‘llagan holda ta’lim oluvchilarda o‘qish savodxonligi samaradorligi sezilarli darajada oshgani aniqlandi. Tajriba-sinov ishlarining so‘nggi yakunlovchi bosqichida olingan natijalar statistik tahlil qilindi (3-jadvalga qarang).

3-jadval

Tajriba va nazorat guruhlarini natijalarining solishtirma jadvali

Baholash mezonlari	Tajriba guruhi (avval)	Tajriba guruhi (keyin)	Farq (%)	Nazorat guruhi (avval)	Nazorat guruhi (keyin)	Farq (%)
Matnni tushunish va tahlil qilish	65.2	80.5	+15.3	64.8	70.2	+5.4
Til ko‘nikmalari va ilmiy terminlardan foydalanish	62.7	78.9	+16.2	62.3	68.1	+5.8
Ijodkorlik va vizual ifoda	66.1	82.3	+16.2	65.5	72.4	+6.9
Fanlararo bilimlarni qo‘llash	60.4	76.8	+16.4	60.1	67.5	+7.4
Matndan anglangan muammoni tahlil qilish va yechim taklif qilish	63.5	79.4	+15.9	63.1	70.8	+7.7
Hamkorlikda ishlash va taqdimot qilish ko‘nikmalari	61.9	77.2	+15.3	61.5	69.2	+7.7
O‘rtacha samaradorlik (μ) (%)	63,3	79,2	+15,9	62,9	69,7	+6,8

Jadvalda keltirilgan tajriba va nazorat guruhlari uchun umumiy samaradorlikni quyidagicha aniqlandi:

Tajriba guruhi uchun:

$$\Delta_x = \frac{79,2 - 63,3}{63,3} \times 100\% = \frac{15,9}{63,3} \times 100\% = 25,1\%$$

Nazorat guruhi uchun:

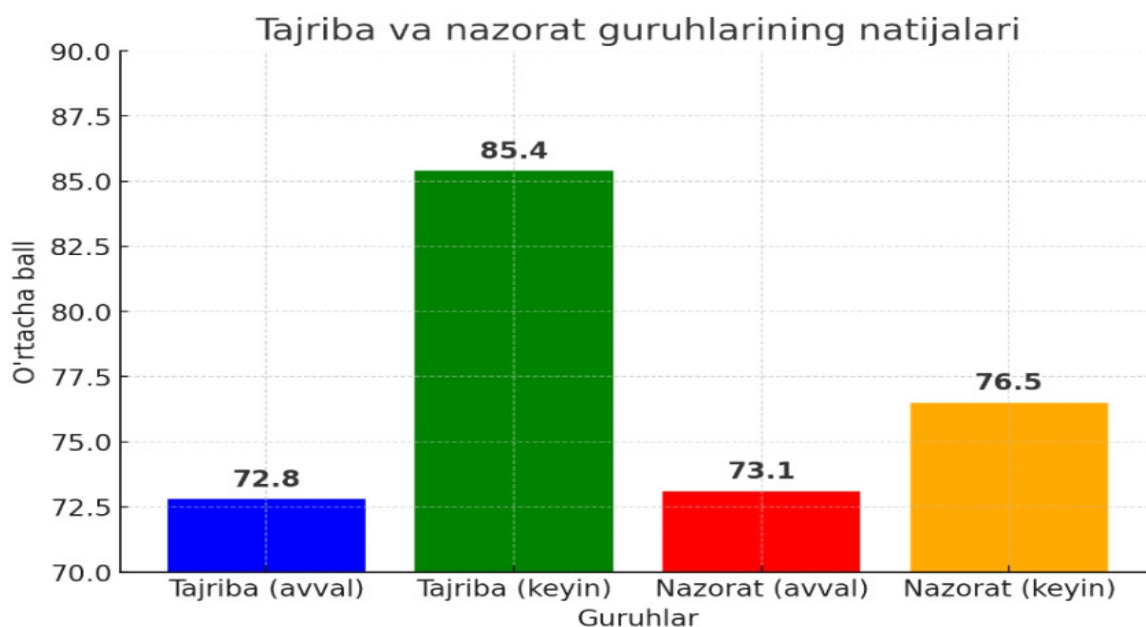
$$\Delta_y = \frac{69,7 - 62,9}{62,9} \times 100\% = \frac{6,8}{62,9} \times 100\% = 10,8\%$$

Tajriba va nazorat guruhlari o'rtasidagi farq:

$$\Delta_{farq} = \Delta_x - \Delta_y = 25,1\% - 10,8\% = 14,3\%$$

Demak, samaradorlik 14,3 % ni tashkil qiladi.

3-jadvalda keltirilgan natijalarning gistogramma orqali ifodasi 3-rasmda keltirilgan (4-rasmga qarang).



4-rasm. Tajriba-sinov natijalarining gistogrammasi

5-jadval

Statistik tahlil kattaliklarining qiymatlari

μ_x	μ_y	σ_x	σ_y	D_x	D_y	S_x	S_y	V_x	V_y	C_x	C_y	t	k	Δ_x	Δ_y
79,2	69,7	2,05	1,8	4,24	3,28	0,1	0,09	2,59	2,58	0,13	0,12	73,08	842,1	0,0096	0,0086

Yuqoridagi natijalarga asoslanib, tajriba-sinov ishlarining sifat ko'rsatkichlarini hisoblaymiz:

$$K_{o'sb} = \frac{(\mu_x - \Delta_x)}{(\mu_y - \Delta_y)} = \frac{79,2 - 0,0096}{69,7 - 0,0086} = \frac{79,19}{69,69} \approx 1,14 > 1;$$

$$K_{bdb} = (\mu_x - \Delta_x) - (\mu_y - \Delta_y) = (79,2 - 0,0096) - (69,7 - 0,0086) = 79,19 - 69,69 = 9,5 > 0$$

Olingan natijalardan o'qitish samaradorligini baholash mezonining birdan kattaligi va bilish darajasiga mos keluvchi baholash mezonining noldan kattaligini ko'rish mumkin. Demak, ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini rivojlantirish metodikasini sinovdan o'tkazish bo'yicha o'tkazilgan tajriba-sinov ishlari samarador ekan va bu samaradorlik o'rtacha 14,3 % ni tashkil etadi.

XULOSALAR

Ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish muammolariga bag'ishlangan tadqiqotimiz asosida quyidagicha xulosalarga kelindi:

1. Ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishga doir o'quv dasturiy hujjatlar, respublikamizdagi kommunikativ va integrativ yondashuvlarga oid huquqiy-me'yoriy hujjatlar, chet til o'qitish metodikasiga oid ilmiy-nazariy g'oyalar mazkur tadqiqot ishi uchun metodologik asos vazifasini bajarganligini ko'rish mumkin.

2. Tadqiqot jarayonida olib borilgan izlanishlar yuqori sinflar uchun malaka talablari, ingliz tili fani o'quv dasturi, darslik va qo'llanmalaridagi mashqlar tizimi o'quvchilarning ingliz tilida STEAM ta'lim texnologiyasi asosida to'laqonli nutqiy kompetensiyani rivojlantirishga muvofiq ravishda ishlab chiqilmaganligi, ingliz tili o'qitish jarayonini zamonaviy talablarga javob bermasligi muammoga tegishli metodik, o'quv-metodik qo'llanmalarining yetarli emasligini ko'rsatdi.

3. Tadqiqotda ingliz tili darslarida o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirish yuqori sinf o'quvchilarining kommunikativ nutqiy kompetensiyasini rivojlantirishga yo'naltirilgan jarayon sifatida maxsus ko'rib chiqildi. Ingliz tilida STEAM ta'lim texnologiyasi asosida o'qitishning mohiyati va mazmuni ilmiy-nazariy jihatdan asoslandi. Ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'qitishda ta'lim mazmunini tanlash, fanlararo hamkorlikka asoslangan jarayonlarni yo'lga qo'yish maqsadga muvofiqligi isbotlandi.

4. Tadqiqotda yuqori sinf o'quvchilarining STEAM ta'lim texnologiyasi asosida kommunikativ nutqiy kompetensiyasini rivojlanganlik darajasini ko'rsatuvchi baholash mezonlari ishlab chiqildi. Yuqori sinf o'quvchilarining ingliz tilida nutqiy kompetensiyasining rivojlanganlik darajalari CEFR talablari doirasida B1 darajasiga to'g'ri kelishi tajriba-sinovdan o'tkazildi.

5. Yuqori sinflarda STEAM ta'lim texnologiyasi asosida ingliz tili o'qitishda nutqiy yo'nalganlik, til tajribasini hisobga olish, nutq namunasi asosida chet til o'rgatish, til mashqi va nutq amaliyotining o'zaro bog'liqligi, nutq faoliyati turlarining o'zaro uzviyligi (integratsiyasi), og'zaki nutqning ilgarilashi, chet tilda tabiiy nutqqa yaqinlashish kabi tamoyillardan foydalanish o'quvchilarning chet tilda lingvistik va nutqiy malakalarini rivojlanishiga turtki bo'ldi.

6. Ingliz tili darslarida STEAM ta'lim texnologiyasidan foydalanish yuqori sinf o'quvchilarining tillarga oid o'quv fanlari (o'zbek, rus va ingliz tillari) va boshqa umumta'limiy fanlar o'rtasidagi integrativ bilimlarni amaliyotda qo'llash,

tanqidiy fikrlash, muammoni hal etish, jamoa yoki guruh bo'lib ishlash va yaratuvchanlik qobiliyatlarini rivojlantirishga xizmat qiladi.

7. Ingliz tili darslarida yuqori sinf o'quvchilarining o'qish kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishda ijodiy va loyihaviy, integratsiyalashgan topshiriq hamda mashqlar tizimi bilan boyitish ta'lim oluvchilarning intellektual, motivatsion hamda emotsional psixik rivojlantirishga qulay bo'lgan didaktik ta'minot yaratish imkonini beradi. Ingliz tili darslarida muammoli va interfaol metodlar, jumladan, "Topshiriqli ta'lim (Task-based learning)", "Loyihali ta'lim (Project-based learning)", "Muammoli ta'lim (Problem-based learning)" metodlari nutqiy kompetensiyalarni rivojlantirishga erishishga turtki bo'ladi.

8. Yuqori sinf o'quvchilarining ingliz tilida STEAM ta'lim texnologiyasi asosida o'qish kompetensiyasini rivojlantirish bo'yicha ishlab chiqilgan didaktik ta'minotlari tajriba-sinovdan o'tkazildi, taklif etilgan metodika o'quvchilarni kasbhunarga bo'lgan qiziqishlarini ortishiga turtki bo'lganligi, o'tkazilgan tajriba-sinov natijalari samaradorligi tajriba guruhlaridagi o'quvchilarning o'qish nutqiy muloqot malakalarini rivojlanganligi 14,3 % ga oshganligi aniqlandi.

TAVSIYALAR

1. O'rta umumta'lim maktablari uchun zamonaviy ingliz tili darslik va qo'llanmalarini yaratish bugungi kun talabidir. Ingliz tili darslik va qo'llanmalarini yaratishda o'quvchilarning nutqiy kompetensiyasini rivojlantirishda STEAM ta'lim texnologiyasidan foydalanishni metodik jihatdan takomillashtirishga alohida e'tibor berish zarur. Ayniqsa, o'quvchilarning nutqiy kompetensiyasini STEAM ta'lim texnologiyasi asosida rivojlantirishda ingliz tili o'qitish maqsadlarini zamonaviy, tabiiy va aniq fanlarni o'qitish talablariga bo'ysundirish ijobiy samara beradi.

2. Yuqori sinf o'quvchilarining nutqiy kompetensiyasini rivojlantirishda kasbga yo'naltirilgan ingliz tilini STEAM ta'lim texnologiyasi asosida o'qitishda tilga oid (o'zbek tili, rus tili va ingliz tili) va boshqa umumta'limiy o'quv fanlarining xususiyat hamda imkoniyatlarini hisobga olgan holda fanlar va ta'lim mazmuni integratsiyasini ta'minlash ingliz tili o'qitishni samarali tashkil qilishda davr talabi ekanligi dissertatsiyada ilmiy-nazariy jihatdan asoslandi, chet til o'qitish amaliyotiga joriy etish kerakligi tavsiya etildi.

3. Yuqori sinf ingliz tili darslik va qo'llanmalarini yaratishda kasbga yo'naltirilgan ingliz tilini STEAM ta'lim texnologiyasi asosida ilg'or pedagogik va axborot texnologiyalari, o'yin-topshiriq, strategiyalar, interaktiv metodlar, kompyuter texnikasi kabi usullardan foydalanishni hisobga olish zamonaviy ingliz tili ta'limini ta'minlash garovi ekanligi tavsiya etiladi.

4. Ingliz tili o'qituvchilarini tayyorlash, qayta tayyorlash va malakasini oshirish jarayoni o'quv rejalariga kasbga yo'naltirilgan ingliz tilini STEAM ta'lim texnologiyasi asosida o'rgatishga doir lingvometodik modelini takomillashtirishga qaratilgan o'quv modullarini kiritish, masofaviy malaka oshirish kurslarini tashkil etish va ularning ilmiy-metodik bazasini yaratish zarurligi tavsiya etiladi.

**ONE TIME SCIENTIFIC COUNCIL AT THE SCIENTIFIC COUNCIL
PhD.03/04.06.2020.Ped.76.02 AWARDED SCIENTIFIC DEGREES AT
NAMANGAN STATE UNIVERSITY**

NAMANGAN STATE UNIVERSITY

AHMADJONOVA ODINA ANVARJON KIZI

**METHODOLOGY OF DEVELOPING PUPILS'
READING COMPETENCE IN ENGLISH CLASSES
(in the example of STEAM educational technology)**

13.00.02 – The theory and methodology of education and upbringing (English language)

**ABSTRACT
of dissertation of the doctor of philosophy (PhD) on PEDAGOGICAL SCIENCES**

The topic of dissertation for the degree of Doctor of Philosophy (PhD is registered with the Higher Attestation Commission under the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan under the number B2023.3.PhD/Ped4964.

The dissertation was completed at the Namangan State University.

The abstract of the dissertation is available in three languages (Uzbek, English, Russian (resume) on the website of the Scientific Council (www.namdu.uz) and on the Information and Education portal "Ziyonet" (www.ziyonet.uz).

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The abstract of the dissertation was distributed on " _____ " _____ 2025.
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INTRODUCTION (abstract of PhD dissertation)

The relevance and necessity of the dissertation topic. The issue of developing the field of education is recognized as one of the urgent tasks in the world. Education serves as the foundation that determines the spiritual, cultural, and socio-economic development of every country. The strengthening of socio-economic and cultural cooperation among countries has increased interest, need, and aspiration for learning foreign languages, especially English, as a means of communicative interaction. In the field of education, special attention is paid to the development of students' subject-related competencies based on modern teaching technologies, including STEAM education technology, taking into account the personal development opportunities of each learner, as well as to the formation of qualities such as independent thinking, creativity, innovation, initiative, rapid communicative interaction, and critical thinking. This, in turn, necessitates the use of STEAM education technology in teaching subjects at general secondary schools, which are an integral part of the education system. In particular, it creates the need to improve the methodological foundations for developing students' reading competence in English classes based on STEAM education technology.

At the global level, extensive research is being conducted to enhance various methods, approaches, and educational technologies in foreign language teaching methodology, particularly in preparing learners for professional activities. Specifically, international organizations offering professional qualifications and certifications - such as TEFL (Teaching English as a Foreign Language), TESL (Teaching English as a Second Language), TESOL (Teaching English to Speakers of Other Languages), and CELTA (Certificate in English Language Teaching to Adults) - are implementing practical projects aimed at improving systems for the effective development of reading competence. These initiatives hold significant scientific and practical value. Currently, considerable attention is also being paid to determining the effectiveness of modern educational programs in aligning learners' knowledge levels with international standards. Among such contemporary educational models, the STEAM approach (Science, Technology, Engineering, Arts, and Mathematics) is receiving particular attention. This educational technology supports the development of students' scientific, technological, constructive, artistic-aesthetic, and mathematical competencies. Consequently, the integration of STEAM education into upper secondary English language teaching is essential for fostering students' reading competence.

In Uzbekistan, significant attention is being paid to modernizing all stages of the education system through innovative approaches. This includes aligning foreign language instruction - particularly English - with contemporary educational standards and ensuring interdisciplinary integration through the implementation of practice-oriented STEAM educational technology. The Presidential Decree of the Republic of Uzbekistan No. PD-5712 dated April 29, 2019, "On the Approval of the Concept for the Development of the Public Education System of the Republic of Uzbekistan until 2030," explicitly emphasizes the introduction of general education programs and new state educational standards that meet the requirements

of a modern, innovation-driven economy¹. This includes a focus on STEAM disciplines and the development of critical thinking skills, as well as the ability to independently process and analyze information. The same concept outlines the training of competitive, highly qualified professionals who can communicate fluently in foreign languages as a national priority. In addition, the Presidential Resolution No. PR-4623 dated February 27, 2020, "On Measures for the Further Development of Pedagogical Education," calls for the development of general secondary education based on both national pedagogical experience and international educational programs. In this regard, integrating STEAM-based education - designed to meet the requirements of international assessment programs such as PIRLS, PISA, TIMSS, EGMA, and EGRA - into the school system, particularly in upper secondary English language instruction, necessitates the refinement of relevant implementation models and methodological conditions.

This dissertation research contributes, to a certain extent, to the implementation of the objectives set forth in a number of key normative and legal documents adopted by the Government of the Republic of Uzbekistan. In particular, it aligns with the tasks outlined in the Presidential Decree No. PD-5712 dated April 29, 2019, "On the Approval of the Concept for the Development of the Public Education System of the Republic of Uzbekistan until 2030," the Presidential Decree No. PD-6108 dated November 6, 2020, "On Measures for the Development of Education, Upbringing, and Science in the New Era of Uzbekistan's Development," the Presidential Decree No. DF-60 dated January 28, 2022, "On the Development Strategy of New Uzbekistan for 2022–2026," and the Presidential Decree No. PD-134 dated May 11, 2022, "On the Approval of the National Program for the Development of Public Education for 2022–2026." It also reflects the goals specified in the Cabinet Resolution No. PR-4119 dated January 16, 2019, "On Additional Measures to Improve the System of Quality Control in Education," and Resolution No. PR-5117 dated May 19, 2021, "On Measures to Bring the Promotion of Foreign Language Learning in the Republic of Uzbekistan to a New Level of Quality," as well as other related regulatory documents in the field

Compliance of the research with the priorities of the development of science and technology of the republic. This research has been carried out in accordance with the priority direction I of the national development of science and technology: "Development of an information-based society and a democratic state in social, legal, economic, cultural, and spiritual-educational spheres, the formation of a system of innovative ideas and the ways of their implementation".

The degree of study of the problem. In our country, the scientific and theoretical issues of teaching English, the linguistic and linguodidactic foundations of developing language and communication skills in a foreign language, the role and significance of texts in developing reading competence in English, the linguistic and linguodidactic description, purpose, objectives, and content of

¹ It was taken from Decree of the President of the Republic of Uzbekistan No. PD-5712 dated April 29, 2019, "On the Approval of the Concept for the Development of the Public Education System of the Republic of Uzbekistan until 2030." [Electronic resource]. Available at: <https://lex.uz/docs/4312785>

teaching the reading of field-specific authentic texts, as well as the stages, forms, methods, principles, and means of teaching reading in English have been studied by J.J.Jalolov, T.Q.Sattorov, S.S.Saydaliev, S.A.Misirov, D.M.Israilova, D.A.Saimnazarova, A.V.Ermirzayev, and U.Y. Soliyev².

The teaching of school subjects based on various approaches, the development of students' key and subject-specific competencies through STEAM educational technology, as well as the pedagogical, methodological, and psychological issues of teaching natural and exact sciences based on STEAM educational technology have been studied by F.J.Masharipova, M.Kh.Tashibekova, Sh.B.Khasanova, J.Tolipova, Z.B.Sangirova, N.B.Zoyirova, K.A.Boymatova, M.G.Burkhanova, M.S.Orifjonova, M.Y.Miralimova, Sh.R.Turdiyev, and M.P.Elboyeva³.

In the research works of scholars from the Commonwealth of Independent States (CIS) such as I.A.Popova, Y.N.Pankratova, S.A.Krilova, N.V.Vaskina, L.I.Repkina, Y.S.Kuznetsova, and N.M.Lozhkina⁴, the psychological and

² Jalolov J.J. Chet til o'qitish metodikasi. Chet tillar oliy o'quv yurtlari (fakultetlari) talabalari uchun darslik qayta ishlangan va to'ldirilgan 2-nashri. –Toshkent: O'qituvchi, 2012. –B. 432.; Sattorov T.Q. Bo'lajak chet tili o'qituvchisining uslubiy omilkorligini shakllantirish texnologiyasi. –T. –TDYUI, 2003.–191 b.; Saydaliev S. Tillar o'qitish metodikasi va ta'lim texnologiyalari (olmon tili misolida) – Namangan.: 2019; Misirov S.A. Ingliz tili mashg'ulotlarida pedagogika va psixologiya yo'nalishi talabalarining kasbiy kompetensiyasini takomillashtirish nazariyasi va amaliyoti//ped.f.f.d. (DSc) disser. Namangan, 2024. – 201 b.; Israilova D.M. Nofilologik oliy o'quv yurtlarida talabalarni fanlararo bog'liqlikda kasbga yo'naltirilgan ingliz tiliga o'qitish (texnologiya fakulteti misolida): Avtoref. dis. ... ped. fan. bo'yicha falsafa dok.–Toshkent, 2020.–B.58.; Saimnazarova D.A. Talabalarga ingliz tilida matn o'qishni o'rgatishning innovatsion texnologiyalari. Ped. fan. bo'yicha falsafa dok. dis. –Toshkent., 2021. –B.134.; Ermirzayev A.V. Yuqori sinf o'quvchilarining sosiolingvistik kompetensiyasini mamlakatshunoslikka oid matnlarni o'qish orqali rivojlantirish texnologiyasi. Ped. fan. bo'yicha falsafa dok. dis. – Namangan., 2022. –B.144; Soliyev U.Y. Talabalarining ingliz tilida o'qish kompetensiyasini rivojlantirish metodikasi (amaliy matematika yo'nalishi misolida): Dis. ... ped. fan. bo'yicha falsafa dok. – Namangan, 2024. – 155 b.;

³Masharipova F.J. CBI va STEAM texnologiyalari asosida bo'lajak biolog o'qituvchilarning o'qish kompetensiyasini takomillashtirish:Ped. fan. nomz. ... dis.- Urganch: UrDU, 2023. –B.159.; Tashibekova M. Boshlang'ich sinflarda STEAM –ta'lim texnologiyasidan foydalanish metodikasi (Tabiiy fanlar misolida).Diss (PhD).-Namangan -2022.B-170.; Xasanova Sh.B. Integrativ yondashuv asosida o'quvchilarning tayanch va fanga oid kompetensiyalarini shakllantirish metodikasi (9-sinf biologiya fanini o'qitish misolida). Diss. (PhD). –T.: 2019. –B.154.; J.Tolipova Tabiatshunoslik fanini o'qitishda STEAM yondashuv. O'quv qo'llanma. Samarqand. 2019. 16-b; Sangirova.Z. Tabiiy fanlarni o'qitishda STEM ta'limidan foydalanish. Science and innovation. International Scientific journal. UIF-2022 №4. <https://cyberleninka.ru/article/n/tabiiy-fanlar-ni-itishda-stem-talimi/viewer>. 345-b); Zoyirova , N. B., Boymatova, K. A., & Burkhanova M.G. (2022). Steam education methodology for preschool children's school preparation using digital technologies. Innovative Development in Educational Activities, 1(5), 238–242.; Orifjonova M.S. The role of clil in steam education in uzbekistan: bridging language and innovation for sustainable development. (2025). Образование наука и инновационные идеи в мире, 70(1), 3-6. <https://scientific-jl.com/obr/article/view/15052>; M.Y.Miralimova 2022. Integrating Steam in English Language Classrooms (K1-K2). International Journal on Integrated Education. 5, 2 (Feb. 2022), 140–144. DOI:<https://doi.org/10.31149/ijie.v5i2.2735>.; Sh.R.Turdiyev STEAM fanlari ta'limi va integratsiyasini yuzaga kelishi modeli. Academic Research in Educational Sciencyes. V. 3. Issue 4. 2022. <https://cyberleninka.ru/article/n/steam-fanlar-talimi-va-integratsiyasini-yuzaga-kelishi-modeli/viewer>; Elboyevaz M.P. "STEAM" approach to studying Uzbek children's literature.(2023). European Journal of Humanities and Educational Advancements (Ejhea), 4 (4), 227-230.;

⁴ Попова И.А. Обучение иноязычному профессионально ориентированному чтению студентов-медиков. Дисс. канд. пед. наук. -Волгоград, 2005.–С.198.; Панкратова Е.Н. Обучение профессионально ориентированному чтению как когнитивно-информационной деятельности на 3-5 курсах неязыкового вуза (на материале английского языка).-Дисс. ...канд. пед. наук.-Н. Новгород: НГЛУ, 2006. –С.208.; Крылова С.А. Методика обучения профессионально ориентированному рефлексивному чтению студентов 1-2 курсов исторических специальностей педагогического вуза (на материале нем. яз.). -Дис. ...канд. пед. наук. -Н. Новгород: НГЛУ, 2008. -250 с.; Васкина Н.В. Обучение профессионально ориентированному чтению

psycholinguistic aspects of developing reading competence in a foreign language, as well as the specific methodological features of developing students' linguistic competence through teaching the reading of professional field-specific texts in a foreign language, have been explored.

In the research conducted by S.Krilova, V.Markova, Y.R.Shipulina, and Y.A.Kuzmina⁵, the organization of the educational process based on STEAM educational technology, the formation of high school students' interest in general education subjects through STEAM educational technology, and the development of students' scientific and research activities are comprehensively covered.

Foreign scholars such as J.C.Alderson, S.C.Thomas, W.Grabe, F.L.Stoller, Sh.Seymour, R.Beaugrand, W.Dressier, and J.Grzesik⁶ have examined the goals and objectives of developing reading competence in foreign language teaching, along with the content, forms, and tools for enhancing reading skills in English.

Researchers such as G.Yakman, M.Sanders, J.Brainer, S.Harkness, K.Johnson, K.Kohler, S.A.Averin, W.H.Tan, R.Subramaniam⁷, and others have explored the phenomenon of STEAM education from various perspectives in their studies.

However, the lack of a scientifically grounded methodology for the application of STEAM education technology in upper secondary English classes, the absence of a clearly defined modern methodological system and its components for developing upper-grade students' reading competence, as well as the insufficient exploration of this issue as an independent research problem within

студентов неязыковых вузов на основе извлечения концепта текста (английский язык). Дис. ...канд. пед. наук. -Н. Новгород: НГЛУ, 2010. -187с.; Репкина Л.И. Профессионально ориентированному чтению текстов психолого-педагогической направленности на основе функционального подхода. Дис. ...канд. пед. наук. - Москва: 2011. -169 с.; Кузнецова Е.С. Развитие умения читать в системе профессиональной подготовки экономистов-аграрников (на материале английского языка). Дис. ...канд. пед. наук. - Елец: 2005. -168 с.; Ложкина Н.М. Формирование иноязычной читательской компетенции студентов экономических специальностей. Дис. ...канд. пед. наук. - Н. Новгород: 2011. -126 с.

⁵ Крылова С.А. Методика обучения профессионально ориентированному рефлексивному чтению студентов 1-2 курсов исторических специальностей педагогического вуза (на материале нем. яз.). -Дис. ...канд. пед. наук. -Н. Новгород: НГЛУ, 2008. -250 с.; Маркова А.К. Формирование мотивации учения в школьном возрасте: Пособие для учителя. -М.: Просвещение, 1983. - 96 с.; Шипулина Е.Р.Формирование профессиональных компетенций будущих учителей на основе курса «STEM технологии в образовании» Магистерская диссертация. Екатеринбург 2020.С:107.; Кузьмина Ю.А.Формирование исследовательских умений у младших школьников в условиях STEM-образования.Россия. Тольятти 2018. -С.193.

⁶ Alderson, J. C. Assessing reading. -New York: Cambridge University Press, 2000. -398 p.; Thomas.S.C. Teaching Reading to English Language Learners: A reflective Guide. CA: Corwin Press. 2009.- 107 p.; Grabe W., Stoller F. L. Teaching and researching reading (2nd ed.). Great Britain: Pearson Education Limited. 2011. -324 p.; Seymour Sh. Essentials of Teaching Academic Reading: English for Academic Success. -Houghton Mufflin Company, 2006. -68 p.; Beaugrand R., Dressier W. Introduction to Text Linguistics. -London: Longman, 1994. -188 p.; Grzesik J. Textverstehen lernen und lehren. -Stuttgart: Klett, Verlag für Wissen und Bildung, 1990. -405 c.

⁷ Yakman G. STEAM—An Educational Framework to Relate Things To Each Other And Reality. K12 Digest February 02.2020. [https://steamedu.com/k12digest/Teaching STEM in the Secondary School, Helping teachers meet the challenge.](https://steamedu.com/k12digest/Teaching%20STEM%20in%20the%20Secondary%20School,%20Helping%20teachers%20meet%20the%20challenge.); Sanders M. (2009). Integrative STEM education: primer. *The Technology Teacher*, 68(4), 20-26.; Breiner J., Harkness S., Johnson C., Koehler C. What Is STEM? A Discussion About Conceptions of STEM in Education and Partnerships // *School Science and Mathematics*. 2012. doi: 10.1111/j.1949-8594.2011.00109.x.; Аверин С.А., Маркова В.А. Стем-технологии в образовании: мода или реальность // *Ребенок в современном образовательном пространстве мегаполиса*. М.: 2017. С. 193-202.; Rum Tan, Stem Education in Singapore: A complete guide for parents-2019.; Subramaniam. R. STEM sohasidagi hamkorlikning eng yaxshi tajribalari: Singapur tajribasi.

the methodology of foreign language teaching, necessitate further scientific investigation in this direction.

The relevance of the research to the scientific-research plans of the higher education institution where the dissertation was carried out. This dissertation was carried out within the framework of the research plan of Namangan State University, under the topic “The study of Uzbek literature abroad and the issues of teaching the English language.”

The aim of the research is to develop proposals and recommendations for improving the methodology of developing students’ reading competence in English classes based on STEAM education technology.

Tasks of the research work:

to identify the linguistic and linguodidactic principles of developing reading competence among upper-grade students through the integration of STEAM education technology in English language classes;

to develop a system of preparatory and speech exercises aimed at developing upper-grade students’ reading skills in English based on STEAM educational technology;

to determine the criteria for the low, lower-intermediate, intermediate, and high levels that define the development of students’ reading competence in English classes based on STEAM educational technology;

to improve the methodology of developing upper-grade students’ reading competence in English classes based on STEAM educational technology.

The object of the research is the process of using STEAM educational technology to develop students’ communicative competence in upper secondary English classes.

The subject of the research is the content, forms, methods, and tools of applying STEAM education technology for the development of communicative competence among upper-grade students in English lessons.

Research methods. During the research theoretical (comparative and analytical), diagnostic (observation, interviews, questionnaires), pedagogical experimentation, mathematical-statistical analysis, and generalization methods were used.

Scientific novelty of the research is as follows:

the linguistic (speech orientation, consideration of language experience, teaching language through speech samples, unity of language exercises and speech practice) and linguodidactic (activity, visualization, and thorough acquisition) principles of developing upper secondary school pupils’ reading competence in English lessons through STEAM-based educational technologies have been theoretically and methodologically substantiated. This has been achieved by integrating modern approaches such as Inquiry-Based Learning, Project-Based Learning, and Problem-Based Learning into the process of teaching English;

a system of linguistic and speech exercises aimed at developing upper secondary school pupils’ reading skills in English within the STEAM education framework has been developed. This system ensures the methodological interrelation of tasks promoting visual creativity, modeling, classification,

teamwork, and critical thinking at the three stages of reading — pre-reading, while-reading, and post-reading;

the criteria (text comprehension, creativity, problem analysis, and problem solving) for determining low, basic, intermediate, and high levels of pupils' reading competence development in English through STEAM technologies have been defined in accordance with the Common European Framework of Reference for Languages (CEFR) at the B1 level. The research identifies the interrelation between the psycho-physiological mechanisms of text anticipation, logical comprehension, and internal verbal hearing with the stages of working with texts, as well as with reading types — fluent reading, close reading, and skimming — and the integration of relevant reading technique exercises;

the content of developing upper secondary school pupils' reading competence in English through STEAM-based technologies has been modernized through the integration of reading-related speech topics (Science, Technology, Engineering, Arts, Mathematics), linguistic material (lexis, grammar, pronunciation), and modern reading strategies such as brainstorming, INSERT, mind mapping, art-technology, physical, didactic, and role-playing activities;

Practical outcomes of the research are as follows:

The indicators determining the development of upper-grade students' reading competence in English classes through STEAM educational technology have been designed in accordance with the Common European Framework of Reference for Languages (CEFR) and introduced into foreign language teaching practice.

The linguistic-didactic principles for developing students' reading competence through STEAM educational technology, along with the content and methodology of using the created linguo-methodological materials, have been presented in scientific and methodological articles as well as in the educational-methodological manual entitled “We Learn STEAM through English.”

Furthermore, an effective linguo-technological model for utilizing the developed linguo-methodological materials to enhance students' reading competence in English classes based on STEAM educational technology has been improved.

The reliability of the research findings is ensured by the development of methodological, psychological, and pedagogical approaches to the problem; the integration of communicative, integrative, profession-oriented, and competency-based approaches in enhancing reading competence in English; the application of national experience; and the incorporation of recommendations from both local and international scholars on organizing educational activities aimed at developing upper-grade students' reading competence in English based on STEAM education. Reliability is also supported by the quantitative and qualitative validity of the analyses, the objectivity of the experimental work, the processing of the results using mathematical-statistical methods, the scientific-methodological justification of the applied approaches, and the practical implementation of the conclusions, proposals, and recommendations.

The Scientific and Practical Significance of the Research. The scientific significance of the research lies in clarifying the content and essence of developing

upper-grade students' reading competence in English based on the STEAM educational approach. It also involves identifying the specific pedagogical and methodological features of teaching reading as a means to develop linguistic and communicative competences, as well as analyzing the theoretical approaches to the problem.

The **practical** significance of the study is reflected in the implementation of the educational-methodological guide “We Learn STEAM through English”, which is based on exercises and tasks aimed at developing upper-grade students' reading competence through STEAM education. Furthermore, the methodology for teaching reading English texts within the framework of STEAM education contributes to the further advancement of teaching methods in the field.

Implementation of the Research Results. The methodological and practical proposals developed within this study for developing students' communicative competence through STEAM educational technology in English classes have been implemented as follows:

the theoretical and methodological proposals for substantiating the integration of linguistic (speech orientation, consideration of language experience, teaching through speech samples, unity of language exercises and practice) and linguodidactic (activity, visualization, and consolidation) principles with modern approaches such as Inquiry-Based, Project-Based, and Problem-Based Learning were applied during educational and cultural activities of the Erasmus+ Capacity Building Project 101129076 “Empower: Women Entrepreneurship, Empowerment, Employability and Self-confidence” implemented at Namangan State Institute of Foreign Languages in 2023–2024 (Reference No. 1282-03, June 5, 2025). As a result, the set of exercises and methodological recommendations developed to improve pupils' reading competence in English contributed to enhancing the quality of education;

the conclusions and recommendations on designing a system of linguistic and speech exercises that promote visual creativity, modeling, classification, teamwork, and critical thinking in the three reading stages — pre-reading, while-reading, and post-reading — were used in preparing the scripts of the educational and cultural TV programs “Education and Development” and “Children and Us” broadcast by the Uzbekistan National Television and Radio Company, Channel ‘Uzbekistan’ in March and May 2024 (Reference No. 04-36-677, May 27, 2024). As a result, the STEAM-based technology for developing reading competence in English among upper secondary school pupils was popularized;

the practical proposals derived from the system of linguistic and speech exercises designed to develop reading skills through STEAM-based technologies were used in creating the educational-methodological guide “We Learn STEAM through English” (Reference No. 01/11-6-366, June 4, 2025, issued by the Republican Education Center under the Ministry of Preschool and School Education of the Republic of Uzbekistan). Consequently, the methodological framework for developing pupils' reading competence in English through STEAM technologies was established;

the exercises aimed at modernizing the internal methodological support of reading-related topics (Science, Technology, Engineering, Arts, Mathematics), linguistic materials (lexis, grammar, pronunciation), and modern reading strategies (brainstorming, INSERT, mind mapping, art-technology, physical, didactic, and role-playing techniques) were implemented in upper secondary English lessons (Reference No. 01/11-6-366, June 4, 2025, Republican Education Center). As a result, the practical significance and applicability of the developed methodology for improving pupils' reading competence in English through STEAM technologies were enhanced.

Approbation of research results. The findings of this research were presented and discussed at five international and two national scientific-practical conferences.

Publication of research results. The research findings have been published in a total of 15 scientific methodological works related to the dissertation topic, including 8 articles published in scientific journals recommended by the Higher Attestation Commission of the Republic of Uzbekistan for the publication of major scientific results of doctoral dissertations - of which 6 were published in national journals and 2 in international journals.

Structure and volume of the dissertation. The dissertation consists of an introduction, three chapters, a conclusion with recommendations, a list of references, and appendices. The total length of the dissertation is 141 pages.

MAIN CONTENT OF THE DISSERTATION

The introduction establishes the relevance of the research topic, describes the goals and objectives, object and subject of the research, indicates its compliance with the priority areas of the development of science and technology in the republic, describes the scientific novelty and practical results of the research, reveals the reliability of the results obtained, scientific and practical significance, provides information on the implementation of the research results in practice, published works and the structure of the dissertation.

The first chapter of the dissertation, entitled “**Scientific-theoretical foundations for developing upper-grade students' reading competence in English through STEAM educational technology**” discusses the use of STEAM education as a contemporary pedagogical issue within high school English classes. It provides a methodological overview of how communicative competence is developed through STEAM-based instruction, elaborating on the conceptual foundations, content, and essence of this process.

This chapter also defines and interprets the meanings of the key terms "STEAM," "competence," and "reading competence," and examines the interrelationship among them.

The STEAM education program is a modern integrative approach that differs fundamentally from traditional education systems and is aimed at fostering XXI century skills. It is structured around the integration of science, technology,

engineering, the arts, and mathematics, with the goal of equipping learners with practical, life-oriented knowledge.

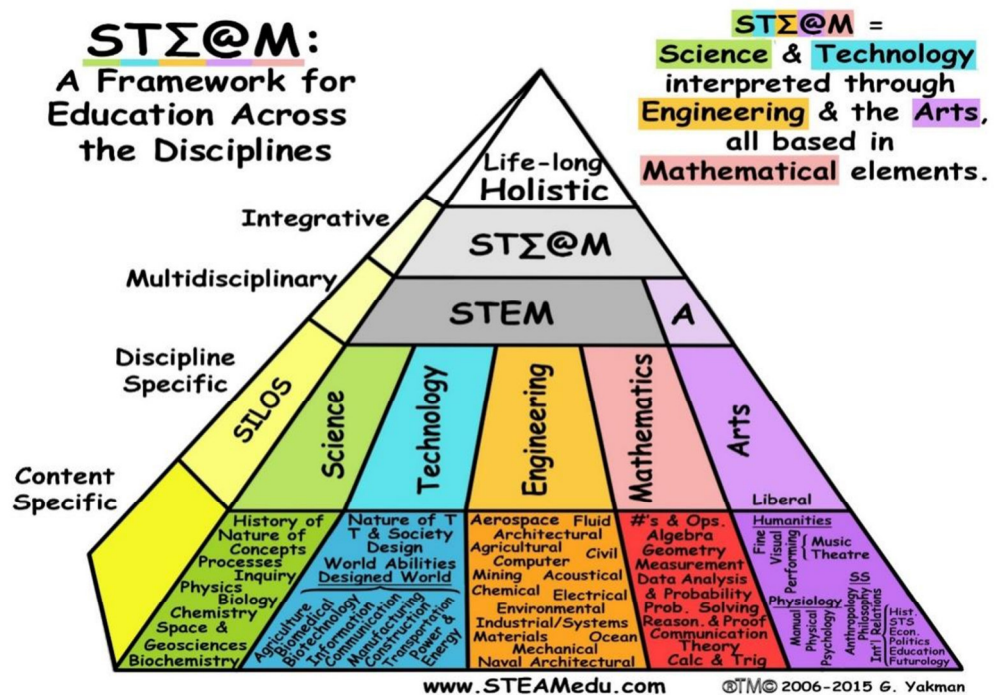
This educational technology is recognized for its potential to develop critical thinking, collaboration, communication, logical reasoning, and creativity. As a multifaceted pedagogical approach, STEAM nurtures multiple disciplines simultaneously and creates a specialized learning environment that encourages students to engage in scientific inquiry, technical creativity, and project-based learning.

One of the leading STEAM theorists, G. Yakman, defines this approach as “a convergence of science and technology interpreted through engineering and the arts, all studied through mathematical elements”. Her model emphasizes the interconnection and interdependence of disciplines within a cohesive learning framework.

According to researcher Y.A. Kuzmina, “STEM education is a methodological direction in teaching, aimed at fostering engineering thinking through the practical application of acquired knowledge. It ensures the integration of elements of physics, mathematics, and natural sciences into the student’s learning process”.

Based on an analysis of STEAM education technology, its multidisciplinary focus is visually represented in the “STEAM Logo” developed by G. Yakman, which reflects its orientation toward various domains (*see Picture 1*).

The logo illustrates the core content of each discipline within STEAM. Researcher G. Yakman highlights the interconnectedness of these fields by stating: “In today’s world, one cannot succeed in Engineering without understanding Art and Mathematics, nor comprehend Science without the aid of Technology.” This statement underscores the interdisciplinary relationships that define STEAM education.



Picture 1. “STEAM Logo” by researcher G.Yakman

The emergence of the STEAM education approach has been a long-term process, with its developmental causes presented in chronological sequence. Various forms of STEAM implementation have been studied across different countries to date, and these developments are illustrated in tabular form (see Table 1).

Table 1

Different forms of STEAM educational technology

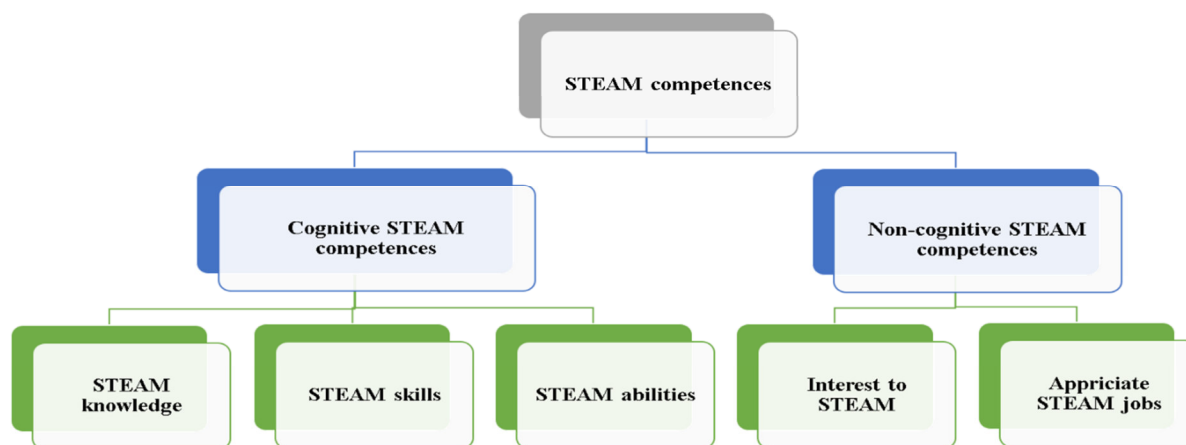
№	Abbreviation form	Expanded form	Definition
1.	STEM	Science, Technology, Engineering, Mathematics	An integrated approach aimed to teach science, technology, engineering, and mathematics
2.	MINT	Mathematics, Informatics, Natural sciences, Technology	An approach developed within the German education system aimed at the integrated teaching of mathematics, computer science, natural sciences, and technology.
3.	STEAM	Science, Technology, Engineering, Arts, Mathematics	A widely adopted educational technology designed for the interdisciplinary teaching of science, technology, engineering, and the arts
4.	STEMM	Science, Technology, Engineering, Mathematics, Medicine	A model of instruction that integrates science, technology, engineering, mathematics, and medical sciences in a unified learning process
5.	STREAM	Science, Technology, Reading+wRiting Engineering, Arts, Mathematics	An educational approach based on the collaborative teaching of science, technology, engineering, arts, and mathematics through reading and writing activities.

English plays a significant role in STEAM disciplines because it serves as a fundamental tool for understanding and interpreting the world around us. The importance of teaching English within the STEAM framework can be observed through several key aspects: 1. Language as a medium for expression: All concepts, ideas, and innovations in STEAM fields are communicated through language. For instance, a mathematical equation is not just a symbolic representation but also a construct that must be articulated and interpreted through verbal explanation, often connecting abstract formulas with real-life applications. 2. Access to educational resources: In order to comprehend academic texts, research journals, and other scholarly sources related to STEAM, learners are required to have an advanced level of English proficiency. Most high-quality scientific literature is produced in English, making it essential for students to

master the language. 3. Critical Thinking and Communication: Learners in STEAM education cannot effectively interpret evidence or articulate scientific ideas without adequate English language skills. The ability to express reasoning, construct logical arguments, and engage in meaningful discourse is heavily reliant on strong communication skills in English. If we aim to understand the future developments and achievements within the STEAM domain, we must first ensure that learners are equipped with the linguistic tools - namely, English - that enable them to access, engage with, and contribute to those advancements.

In this chapter, the term “competence” is analyzed in depth. According to the Explanatory Dictionary of the Uzbek Language, the word “kompetensiya” is derived from the Latin *competere*, meaning “to be capable” or “to be suitable”. It is defined as either the authority of a specific body or official as stipulated in formal documents, or an individual’s level of awareness and expertise in a particular field. More broadly, competency refers to a person's qualification, adequacy, or proficiency in a certain domain, encompassing both theoretical knowledge and practical skills.

Within the scope of this research, particular attention is given to the concept of STEAM competencies. According to definitions provided by UNESCO, “STEAM competency refers to the ability of individuals to effectively apply the knowledge and skills acquired in the fields of Science, Technology, Engineering, Arts, and Mathematics in real-life contexts, including daily activities, workplaces, and educational settings”. Based on the review of relevant literature, the components of STEAM competencies have been systematically categorized and presented in tabular form (*see Picture 2*).



Picture 2. Components of STEAM competencies

One of the central concepts of this research is reading competency, which is examined as one of the four components of communicative competence, alongside listening, writing, and speaking. According to the Explanatory Dictionary of the Uzbek Language, reading is defined as “the act of interpreting written forms such as words, sentences, and texts either silently or aloud.” Educational scholars, however, offer a broader interpretation of the concept. They define reading as “the process of converting information encoded in graphic form into an entirely different code, namely, a sound code.” In this sense, reading is not merely a mechanical decoding of symbols, but a complex cognitive activity that enables the extraction and interpretation of meaning from written texts.

Students are taught reading primarily for two purposes: the first is to understand the content (what the text is about), and the second is to develop the reading process itself (reading silently or aloud). Reading, as a type of receptive language activity, refers to the process of extracting information (meaning) from written text. This can be carried out in two main ways: silent reading, which involves internal processing of the text, and oral reading, which aims to convey the information to others by vocalizing the text.

During the course of the study, various types of reading were examined, including: 1. Reading for gist (skimming the text for general meaning); 2. Reading to extract detailed information (careful and analytical reading); 3. Reading to extract specific information (scanning the text for particular facts or data). Additionally, the stages of reading instruction were identified and analyzed: 1. Pre-reading (activating background knowledge, predicting content); 2. While-reading (engaging with the text and constructing meaning); 3. Post-reading (reflecting on, analyzing, or applying the content of the text). These types and stages of reading are integral to the development of learners' reading competence, especially within the context of STEAM-based instruction

This chapter also analyzes the main aims and goals of teaching English as a foreign language, namely: practical, educational, cultural, and developmental objectives. Within the scope of this study, these goals are considered essential for shaping comprehensive language competence among secondary school learners. To effectively implement these objectives in the foreign language teaching process, it is necessary to ensure that upper-grade students acquire the four key types of communicative language skills in English: Reading, Listening, Writing, and Speaking - at the B1 level of proficiency. This requires developing their knowledge, skills, and abilities in an integrated and systematic manner, aligned with the broader goals of modern language education and the STEAM-based instructional model.

In the second chapter of the dissertation, entitled "**Methodology for developing students' reading competence in English through STEAM educational technology in upper-grade classes**", a methodology was developed for enhancing students' reading competence in English by means of STEAM-based instructional approaches. This chapter provides a scientific and methodological justification for the effectiveness of using STEAM-integrated tasks at the three main stages of teaching reading in English language lessons. The integration of STEAM elements into each of these stages is shown to enhance learners' engagement, comprehension, and critical thinking, thereby contributing significantly to the development of their reading skills.

The use of three stages of working with texts in English lessons - pre-reading, while-reading, and post-reading - enhances learners' comprehension of the text, helps them retain new information obtained from the text, and improves their ability to use new lexical and grammatical units in communication. Applying these stages in upper secondary English classes in combination with STEAM-integrated tasks not only develops learners' types of speech activity, but also promotes critical thinking, creativity, communicative competence, logical reasoning, and teamwork skills, while enabling them to apply their knowledge in practice. In addition, working with texts related to STEAM fields helps students become

familiar with subject-specific vocabulary, which can increase their interest in future professions. This process was explored from a scientific and theoretical perspective in the research.

The development of speaking skills generally begins with knowledge acquisition and encompasses stages leading to practical skills and competencies. This process involves three main stages of speaking activity as described in psycholinguistics: visual perception of speech units, transforming them into speech actions, and processing their meaning. Lessons conducted based on the STEAM educational approach enrich these stages with meaningful content, fostering a high level of cognitive engagement and communicative need among learners.

Motivation is considered the primary driving factor behind speaking activity. STEAM-based lessons stimulate students' intrinsic motivation by fostering curiosity, a desire for knowledge, and an aspiration toward scientific inquiry. In addition, external stimuli provided by the teacher - such as thought-provoking questions, discussions, and project-based tasks - enhance student engagement and promote active communication.

From a didactic perspective, STEAM-oriented texts guide learners towards cognitive activity such as information searching, analyzing, and articulating their understanding. For example, tasks such as reading about environmental issues, discussing new technologies, or writing articles based on scientific experiments play a significant role in developing students' speech skills.

In upper secondary English language instruction, reading activities serve not only practical purposes but also fulfill educational, moral, and developmental goals. As the semantic, grammatical, and stylistic complexity of texts increases, students are required to engage in analytical and synthetic thinking. When integrated with the STEAM approach, this process supports the development of students' competencies not only in language acquisition but also in problem-solving, creativity, interpretation, and scientific communication.

Reading tasks designed within the STEAM framework aim to facilitate information acquisition through reading, promote critical analysis, and encourage re-expression of content within relevant contexts. In particular, engaging with texts related to scientific, technical, artistic, and social domains enables students to comprehend real-world knowledge through the medium of English. This, in turn, lays a solid foundation for the development of their oral communication skills.

The application of the STEAM approach to developing speaking skills provides several key advantages: 1. It creates real communicative situations: STEAM-based projects, experiments, and problem-solving tasks naturally engage students in authentic interaction. Learners are required to explain experiment outcomes, exchange ideas in groups, and make decisions, which in turn fosters the need to articulate thoughts - serving as a natural basis for developing speaking skills; 2. STEAM activates creativity and critical thinking. In the process of speaking, learners are not only encouraged to construct grammatically correct sentences but also to express meaningful, well-reasoned, and persuasive ideas. The STEAM methodology promotes this type of reasoning - such as explaining the essence of a scientific project or defending a point of view in a group discussion; 3. It creates a multimodal communicative environment. Since STEAM activities often involve visuals such as diagrams, drawings, models, and experiments, the

speaking process is enriched with extralinguistic elements like gestures, object demonstrations, and visual aids, contributing to more natural and fluent verbal expression; 4. It strengthens text-based speaking skills. By reading, analyzing, and interpreting STEAM-related texts, learners transition into oral expression. Thus, reading and speaking develop in an integrated way. Tasks such as reformulating information from texts, expressing key ideas, and answering questions orally serve as a bridge from reading to speaking. The research also examines how integrating various types of speech activity with the STEAM approach in English lessons fosters students' communicative competence. Specifically, it addresses the development of learners' reading competence through STEAM-based instruction as a means to enhance their overall communicative skills to a B1 level in accordance with the Common European Framework of Reference for Languages (CEFR).

STEAM education is an innovative approach that integrates the fields of science, technology, engineering, arts, and mathematics to enhance learners' understanding of complex concepts and the development of practical skills. This framework aligns with international assessment programs such as PISA, PIRLS, TIMSS, EGMA, and EGRA, each of which plays a significant role in evaluating students' language competencies, including their reading and comprehension skills. The current research analyzes the key features and relevance of these international assessment systems.

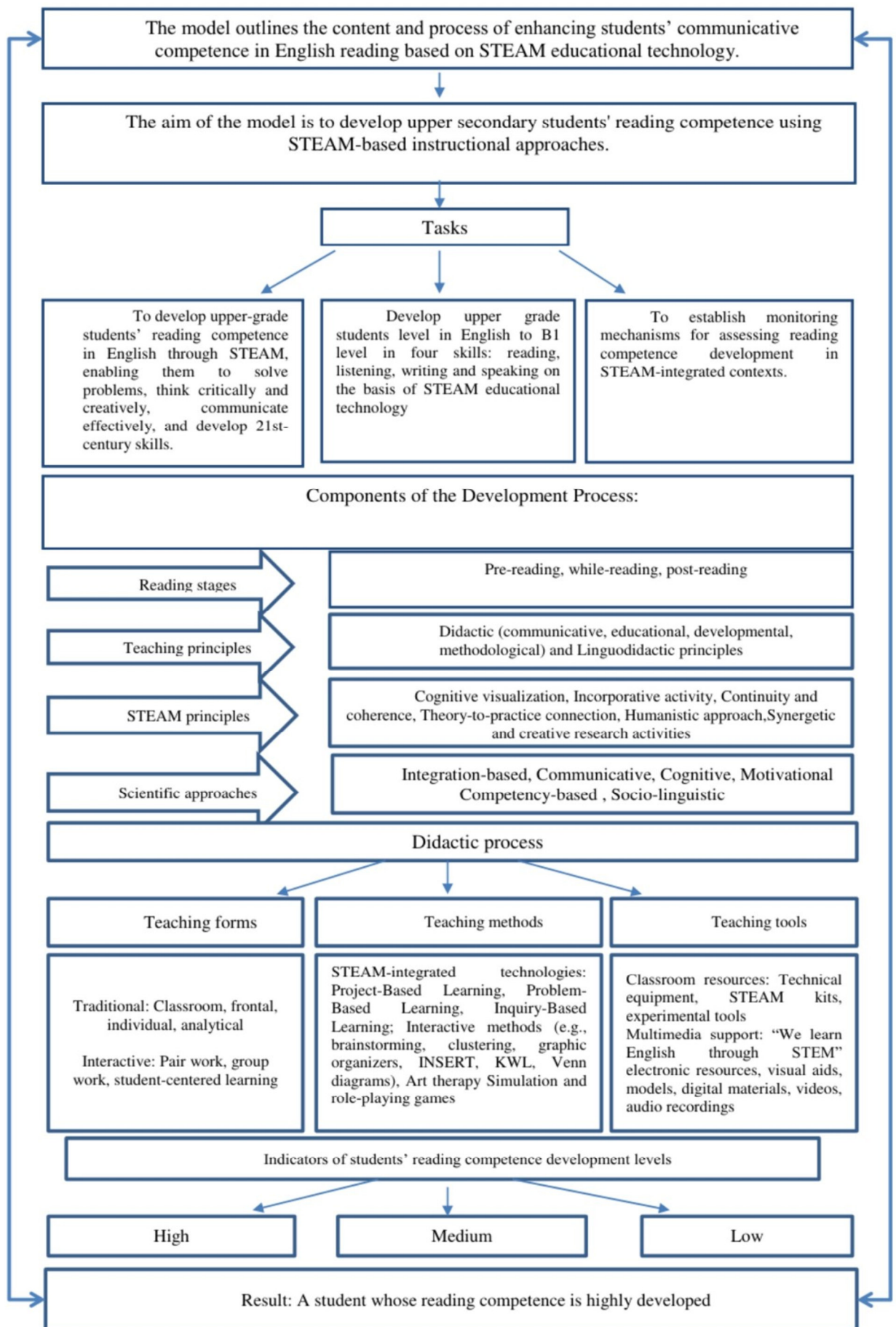
The implementation of STEAM educational technology within the learning process is based on a set of pedagogical principles. These principles are examined in the context of applying STEAM in English language lessons, with particular attention to how this integration supports the development of reading competence and communicative skills. (See Table 2).

Table 2

Principles of STEAM

Principles of STEAM	Continuity and holistic approach principle
	Scientific validity principle
	Integrative approach principle
	Humanistic orientation of education principle
	Theory-to-practice principle
	Cognitive-visual principle
	Free and active learning principle
	Synergetic activity principle
	Incorporative activity principle
	Creative Inquiry-based activity principle
Collaborative learning approach principle	

Based on the aforementioned principles, methodological materials were developed and effectively utilized in upper-grade English classes with the aim of developing students' reading competence. In this process, innovative pedagogical approaches were applied in line with the learning environment created for students, the instructional objectives of the lessons, and the core principles of English language teaching.



Picture 3. A linguo-methodological model for developing students' reading competence through STEAM-based English language instruction

The challenges related to developing reading competence among upper secondary school learners through STEAM-based instruction were identified using modern pedagogical frameworks such as Inquiry-Based Learning, Project-Based Learning, and Problem-Based Learning. The content of these educational approaches, as well as methodological guidelines for their integration into English language instruction - particularly within the context of STEAM education - are provided and discussed in detail

Sample lesson plans aimed at developing students' reading competence through the integration of STEAM educational technologies in English classes were presented. Furthermore, the research analyzed the content of English language instruction for upper secondary school students in alignment with STEAM principles, evaluating it from a scientific and methodological perspective according to modern educational requirements. In this context, recommendations were provided on how to integrate reading strategies with innovative instructional techniques such as brainstorming, INSERT, clustering, art therapy, kinesthetic learning, didactic methods, and role-playing and simulation games to ensure internal integration of reading tasks within the STEAM framework.

The purpose of the model for developing students' reading competence through STEAM-based English language instruction is to enhance learners' reading skills in integration with XXI century competencies. In order to achieve this goal, the following objectives have been identified: 1. To develop XXI century skills such as problem-solving, critical thinking, creativity, and communication in upper secondary school students by enhancing their English reading competence through the STEAM education approach; 2. To raise students' proficiency level in the main types of speech activity (reading, listening, writing, and speaking) to B1 level by integrating STEAM-based instruction in English lessons; 3. To carry out monitoring and evaluation of students' reading competence development outcomes through the application of STEAM-based English teaching methods.

In the process of developing students' reading competence in English lessons through the integration of STEAM education technology, several core components were identified: stages of reading, teaching principles, STEAM principles, and scientific approaches. Each of these components, in turn, encompasses multiple subcomponents. The stages of reading are classified into three types: 1. Pre-reading – activities carried out before engaging with the text; 2. While-reading – activities during the reading process; 3. Post-reading – activities conducted after reading the text. The teaching principles include didactic principles (communicative, educational, developmental, and instructional), methodological, and linguodidactic principles. The STEAM principles encompass continuity and integrity, scientific grounding, integrative approach, humanistic content of education, connection of theory with practice, cognitive-visual learning, student-centered active learning, synergetic activity, incorporation of disciplines, creative inquiry, and collaborative approach. Furthermore, the model highlights the key elements of the didactic process such as forms of instruction, teaching methods, and educational tools, all of which are aligned with the goals of enhancing students' reading competence within a STEAM-integrated English language curriculum.

The third chapter, entitled “Experimental Work on Developing Students' Reading Competence in English Based on STEAM Educational Technology in

Upper Grades,” focuses on the objectives and tasks of the experimental study, quantitative and qualitative indicators of the results, as well as their statistical analysis.

The experimental work was conducted at secondary schools №. 34 and 50 in Balikchi district of Andijan region; schools №. 6 and 7 in Yozyovon district of Fergana region; and schools №. 20 and 22 in Namangan district of Namangan region. A total of 842 students participated in the experiment as respondents. The experimental study was carried out over the period of 2022–2025 and was implemented in three stages:

1. Diagnostic Stage (2022–2023). During this stage, methodological guides related to foreign language teaching – particularly English language teaching – were examined. Research studies focused on the integration of STEAM educational technology into teaching processes, as well as the content of core concepts and relevant online materials, were also reviewed. Additionally, the content of curriculum-related regulatory documents was analyzed. To determine the current state of the issue in practice, the English language teaching processes in upper grades were studied both within Uzbekistan and in foreign countries.

2. Formative Stage (2023–2024). At this stage, the methodological framework for developing upper-grade students’ reading competence through STEAM educational technology in English classes was refined. Specifically, the stages of activity, creative skills development, and methods that promote reading literacy based on the STEAM approach were identified. Emphasis was placed on fostering students’ creative engagement through a combination of traditional methods – such as pedagogical observation, interviews, discussions, pedagogical influence, and training tests – as well as interactive strategies including games, problem-based learning, art integration, and the use of information technologies.

In the experimental groups, English lessons were conducted using STEAM educational technology, incorporating various innovative teaching methods in a harmonized manner. These groups followed a specially developed instructional program titled "We Learn STEAM Through English." In contrast, control groups continued with traditional teaching methods and conventional educational practices. The STEAM-based lessons not only enhanced students’ English language competence but also stimulated their interest in other STEAM subjects. Furthermore, improvements were observed in students’ ability to think independently, solve problems, think critically, display creativity, and work collaboratively within teams.

3. Summative Stage (2024–2025). During this stage, the effectiveness of developing students’ reading competence in upper-grade English classes through the application of selected forms, methods, and tools based on the pedagogical model of STEAM educational technology was assessed. It was found that students’ reading literacy had significantly improved. The students’ knowledge was tested using adaptive tasks developed in accordance with international assessment standards. In the final phase of the experimental study, the results obtained were subjected to statistical analysis.

Table 3

Comparative table of experimental and control group results

Assessment criteria	Experimental group (before)	Experimental group (after)	Difference (%)	Control group (before)	Control group (after)	Difference (%)
Understanding and analyzing the text	65.2	80.5	+15.3	64.8	70.2	+5.4
Use of language skills and scientific terminology	62.7	78.9	+16.2	62.3	68.1	+5.8
Creativity and visual expression	66.1	82.3	+16.2	65.5	72.4	+6.9
Application of interdisciplinary knowledge	60.4	76.8	+16.4	60.1	67.5	+7.4
Analyzing the problem identified and proposing solutions	63.5	79.4	+15.9	63.1	70.8	+7.7
Collaboration and presentation skills	61.9	77.2	+15.3	61.5	69.2	+7.7
Average effectiveness (μ) (%)	63,3	79,2	+15.9	62.9	69.7	+6,8

“The overall effectiveness for the experimental and control groups presented in the table was determined as follows:

For the experimental group:

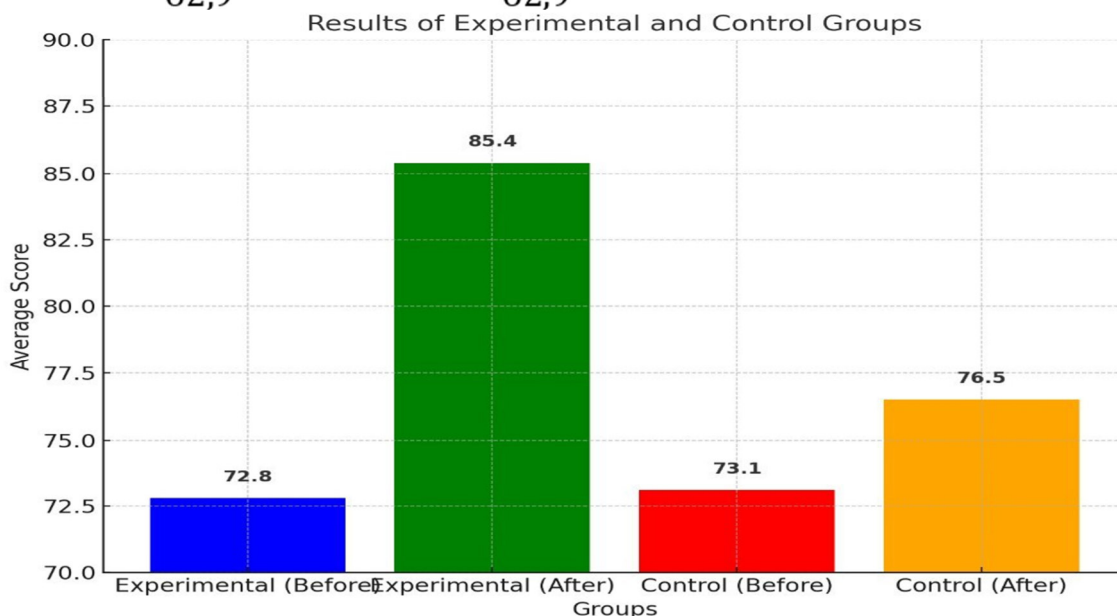
$$\Delta_x = \frac{79,2 - 63,3}{63,3} \times 100 \% = \frac{15,9}{63,3} \times 100 \% = 25.1 \%$$

For the control group:

$$\Delta_y = \frac{69,7 - 62,9}{62,9} \times 100 \% = \frac{6,8}{62,9} \times 100 \% = 10,8 \%$$

The difference between the experimental and control groups:”1. For experimental group:

$$\Delta_y = \frac{69,7 - 62,9}{62,9} \times 100 \% = \frac{6,8}{62,9} \times 100 \% = 10,8 \%$$



Picture 4. A histogram of experimental study

Table 5**Values of statistical analysis parameters**

μ_x	μ_y	σ_x	σ_y	D_x	D_y	S_x	S_y	V_x	V_y	C_x	C_y	t	K	Δ_x	Δ_y
79,2	69,7	2,05	1,8	4,24	3,28	0,1	0,09	2,59	2,58	0,13	0,12	73,08	842,1	0,0096	0,0086

Drawing on the results presented above, the qualitative indicators of the experimental study are calculated.

$$K_{o'sb} = \frac{(\mu_x - \Delta_x)}{(\mu_y - \Delta_y)} = \frac{79,2 - 0,0096}{69,7 - 0,0086} = \frac{79,19}{69,69} \approx 1,14 > 1;$$

$$K_{bdb} = (\mu_x - \Delta_x) - (\mu_y - \Delta_y) = (79,2 - 0,0096) - (69,7 - 0,0086) \\ = 79,19 - 69,69 = 9,5 > 0$$

The obtained results indicate that the effectiveness criterion of teaching exceeds the value of one, and the assessment criterion corresponding to the level of cognitive achievement is greater than zero. Therefore, the experimental study conducted to test the methodology for developing senior students' reading competence in English lessons has proven to be effective, with an average efficiency rate of 14.3%.

CONCLUSIONS

Based on the conducted research devoted to the development of senior pupils' reading competence in English lessons through STEAM education technology, the following conclusions have been drawn:

1. The analysis of English language curricula, national educational standards, and normative documents regulating communicative and integrative approaches in the Republic of Uzbekistan, as well as theoretical and methodological sources on foreign language teaching, revealed that these serve as the methodological foundation for this study.

2. The findings of the research indicate that current qualification requirements, English language curricula, textbooks, and manuals for upper secondary schools do not sufficiently support the development of learners' communicative competence in line with STEAM education principles. It was also found that the English teaching process and related instructional materials do not fully meet modern educational demands.

3. The study considered the development of reading competence through STEAM-based instruction as a process aimed at enhancing senior pupils' communicative language competence. The essence and content of teaching English based on STEAM were theoretically substantiated. It was proven that the integration of interdisciplinary collaboration and careful selection of educational content are essential for the effective organization of the learning process.

4. Assessment criteria were developed to determine the level of communicative competence of senior pupils within the framework of STEAM-based English language teaching. The experimental implementation confirmed that learners' communicative proficiency corresponds to the B1 level of the Common European Framework of Reference for Languages (CEFR).

5. The use of linguistic and didactic principles—such as communicative orientation, reliance on linguistic experience, learning through speech models, the unity of language exercises and speech practice, integration of speech activities, and the prioritization of oral communication—proved effective in enhancing students’ linguistic and communicative skills in a foreign language.

6. The application of STEAM education technology in English lessons fosters learners’ ability to integrate interdisciplinary knowledge across linguistic (Uzbek, Russian, and English) and general education subjects. It also contributes to developing critical thinking, problem-solving, teamwork, and creativity.

7. The integration of creative, project-based, and interdisciplinary tasks and exercises into STEAM-oriented English lessons provides a favorable didactic environment that promotes students’ intellectual, motivational, and emotional development. The implementation of interactive and problem-based methods - such as Task-based Learning, Project-based Learning, and Problem-based Learning - stimulates the growth of communicative competence.

8. The experimental testing of the developed didactic framework for enhancing reading competence through STEAM education technology demonstrated its effectiveness. The results showed that learners’ communicative reading skills improved by 14.3%, indicating that the proposed methodology significantly increased students’ motivation and interest in professional-oriented English learning.

RECOMMENDATIONS

1. The development of modern English language textbooks and manuals for secondary schools is a pressing necessity. Special attention should be given to methodically improving the use of STEAM education technology in fostering students’ communicative competence. Aligning English teaching goals with the principles of natural sciences and technical disciplines within STEAM education yields highly positive outcomes.

2. Integrating the content and features of linguistic subjects (Uzbek, Russian, and English) with other general education disciplines in the context of STEAM-oriented English instruction has been scientifically substantiated as an effective approach. It is recommended to implement this integration into foreign language teaching practice to meet modern educational demands.

3. When developing career-oriented English textbooks and teaching aids based on STEAM education, it is recommended to incorporate advanced pedagogical and digital technologies, interactive strategies, game-based activities, and computer-assisted methods to ensure modern, high-quality English language education.

4. In teacher training, retraining, and professional development programs, it is advisable to introduce linguomethodological modules focused on teaching career-oriented English through STEAM education technology. Additionally, organizing distance learning courses and creating a scientific-methodological base to support these modules will contribute to improving the overall quality of English language instruction.

**РАЗОВЫЙ НАУЧНЫЙ ПРИ НАУЧНОМ СОВЕТЕ
PhD.03/04.06.2020.Ped.76.02 ПО ПРИСУЖДЕНИЮ УЧЕНЫХ
СТЕПЕНЕЙ ПРИ НАМАНГАНСКОМ ГОСУДАРСТВЕННОМ
УНИВЕРСИТЕТЕ**

НАМАНГАНСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

АХМАДЖОНОВА ОДИНА АНВАРЖОН КИЗИ

**МЕТОДИКА РАЗВИТИЯ ЧТАТЕЛСКОЙ КОМПЕТЕНЦИИ
УЧАЩИХСЯ НА УРОКАХ АНГЛИЙСКОГО ЯЗЫКА (на примере
STEAM-образовательной технологии)**

13.00.02 – Теория и методика обучения и воспитания (английский язык)

**АВТОРЕФЕРАТ
диссертации доктора философии (PhD) по ПЕДАГОГИЧЕСКИМ НАУКАМ**

Тема диссертации на соискание ученой степени доктора философии (PhD) зарегистрирована в Высшей аттестационной комиссии при Агентстве по высшему образованию, науке и инновациям Республики Узбекистан под номером В2023.3.PhD/Ped4964.

Диссертационная работа выполнена в Наманганском государственном университете.

Автореферат диссертации представлен на трех языках (узбекском, английском и русском (резюме)) и размещён на веб-сайте диссертационного совета (www.namdu.uz), а также на информационно-образовательном портале «Ziyonet» (www.ziyonet.uz).

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Ведущая организация:

**Андижанский государственный институт
иностранных языков**

Защита диссертации состоится «_____» _____ 2025 года в _____ часов на заседании Разового научного совета PhD.03/04.06.2020.Ped.76.02 по присуждению ученых степеней при Наманганском государственном университете. (Адрес: 160119, город Наманган, улица Бобуршох, дом 161. (+99869) 228-85-01, Faks: 228-85-02, e-mail: info@namdu.uz).

С диссертацией можно ознакомиться в информационно-ресурсном центре Наманганского государственного университета (зарегистрирована за № _____). Адрес: 160119, улица Бобуршох, дом 161. Тел.: (+99869) 228-85-01.

Автореферат диссертации разослан «_____» _____ 2025 года.
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ВВЕДЕНИЕ (философия докторская (PhD) диссертация аннотация)

Цель исследования заключается в разработке предложений и рекомендаций по совершенствованию методики развития читательской компетенции учащихся на уроках английского языка на основе технологии STEAM-обучения.

В качестве **объекта исследования** выбраны процессы использования STEAM-образовательной технологии в развитии читательской компетенции учащихся на уроках английского языка в старших классах.

Научная новизна исследования заключается в следующем: теоретически и методически обоснованы лингвистические (речевая направленность, учет языкового опыта, обучение на основе речевого образца, единство языковых упражнений и речевой практики) и лингводидактические (активность, наглядность и прочное усвоение) принципы развития компетенции чтения учащихся старших классов на уроках английского языка на основе технологий STEAM-образования посредством интеграции современных подходов, таких как обучение на основе исследования (Inquiry-based learning), обучение на основе проектов (Project-based learning) и обучение на основе решения проблем (Problem-based learning), в процесс преподавания английского языка;

разработана система языковых и речевых упражнений, направленных на развитие навыков чтения учащихся старших классов по английскому языку в рамках технологий STEAM-образования, обеспечивающая методическую взаимосвязь упражнений, развивающих визуальное творчество, моделирование, классификацию, работу в группе и критическое мышление, на трех этапах чтения — предтекстовом, текстовом и послетекстовом;

определена система критериев, характеризующих низкий, базовый, средний и высокий уровни развития компетенции чтения учащихся на уроках английского языка на основе технологий STEAM в соответствии с требованиями общеевропейских компетенций владения иностранным языком (CEFR) на уровне B1. Установлена взаимосвязь психофизиологических механизмов предвосхищения текста (антиципации), логического понимания и внутреннего речевого слуха с этапами работы с текстом, а также с видами чтения — ознакомительным (fluent reading), изучающим (close reading) и просмотрным (skimming reading) — и соответствующими упражнениями, направленными на развитие техники чтения;

содержание развития компетенции чтения учащихся старших классов по английскому языку на основе технологий STEAM модернизировано за счет интеграции речевых тем, связанных с чтением (Science, Technology, Engineering, Arts, Mathematics), языкового материала (лексики, грамматики и произношения), а также современных стратегий чтения (brainstorming, INSERT, mind mapping, арт-технологии, подвижные, дидактические и ролевые игры) и их внутреннего методического обеспечения.

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Внедрение результатов исследования: На основе разработанных предложений по развитию речевой компетенции учащихся на уроках английского языка с применением технологий STEAM:

теоретически и методически обоснованные предложения по интеграции лингвистических (речевая направленность, учет языкового опыта, обучение на основе речевого образца, единство языковых упражнений и речевой практики) и лингводидактических (активность, наглядность и прочное усвоение) принципов с современными подходами, такими как Inquiry-based learning, Project-based learning и Problem-based learning, были использованы в образовательных и культурных мероприятиях проекта Erasmus+ Capacity Building Project 101129076 “Empower: Women Entrepreneurship, Empowerment, Employability and Self-confidence”, реализованного в 2023–2024 годах в Наманганском государственном институте иностранных языков (справка №1282-03 от 5 июня 2025 г.). В результате разработанный комплекс упражнений и методические рекомендации, направленные на развитие компетенции чтения на английском языке, способствовали повышению качества образования;

выводы и рекомендации по созданию системы языковых и речевых упражнений, направленных на развитие визуального творчества, моделирования, классификации, командной работы и критического мышления на трех этапах чтения — предтекстовом, текстовом и послетекстовом, — были использованы при подготовке сценариев образовательных и культурных телепередач «Образование и развитие» и «Дети и мы», вышедших в эфир на телеканале «Узбекистан» Национальной телерадиокомпании Узбекистана в марте и мае 2024 года (справка №04-36-677 от 27 мая 2024 г.). В результате технология развития компетенции чтения учащихся старших классов на английском языке на основе STEAM была популяризирована;

практические предложения, выработанные на основе системы языковых и речевых упражнений, направленных на развитие навыков чтения с использованием технологий STEAM, были применены при подготовке учебно-методического пособия «We Learn STEAM through English (Изучаем английский язык на основе STEAM)» (справка №01/11-6-366 от 4 июня 2025 г., выданная Республиканским образовательным центром при Министерстве дошкольного и школьного образования Республики Узбекистан). В результате была создана методическая база для развития компетенции чтения учащихся старших классов по английскому языку на основе технологий STEAM;

упражнения, направленные на модернизацию внутреннего методического обеспечения речевых тем, связанных с чтением (Science, Technology, Engineering, Arts, Mathematics), языкового материала (лексики, грамматики и произношения) и современных стратегий чтения (brainstorming, INSERT, mind mapping, арт-технологии, подвижные, дидактические и ролевые игры), были внедрены в уроки английского языка в старших классах (справка №01/11-6-366 от 4 июня 2025 г., Республиканский

образовательный центр). В результате достигнуто повышение уровня практической значимости разработанной методики развития компетенции чтения учащихся старших классов на английском языке на основе технологий STEAM.

Апробация результатов исследования. Результаты настоящего исследования были обсуждены на 5 международных и 2 республиканской научно-практической конференциях.

Публикация результатов исследования. По теме диссертации опубликовано всего 15 научно-методических работ, включая 8 статей в научных изданиях, рекомендованных Высшей аттестационной комиссией Республики Узбекистан для публикации основных научных результатов докторских диссертаций, из которых 6 – в республиканских, а 2 – в зарубежных журналах.

Структура и объем диссертации. Диссертация состоит из введения, трёх глав, заключения и рекомендаций, списка использованной литературы и приложений. Общий объем работы составляет 140 страниц.

E'LON QILINGAN ISHLAR RO'YXATI
LIST OF PUBLISHED WORKS
СПИСОК ОПУБЛИКОВАННЫХ РАБОТ

I bo'lim (part I; часть I)

1. Ahmadjonova O.A. Ingliz tili darslarida STEAM ta'lim texnologiyasidan foydalanishning retrospektiv sharhi // Namangan davlat universiteti ilmiy axborotnomasi. – Namangan, 2023. – № 12. – B. 496-502. (13.00.00; №30).

2. Ahmadjonova O.A. Ingliz tili darslarida o'quvchilarning kommunikativ nutqiy kompetensiyasini rivojlantirish texnologiyasi (STEAM ta'lim texnologiyasi misolida) // Ijtimoiy-gumanitar fanlarning dolzarb muommolari. – Samarqand, 2023. – №11. – B. 448-453. (13.00.00. OAK rayosatining 2022-yil 30-noyabridagi 327/5-son qarori).

3. Ahmadjonova O.A. Ingliz tili darslarida o'quvchilarning kommunikativ nutqiy kompetensiyasini rivojlantirish texnologiyasi (STEAM ta'lim texnologiyasi misolida) // Ijtimoiy-gumanitar fanlarning dolzarb muommolari. – Samarqand, 2023. – №11. – B. 448-453. (13.00.00. OAK rayosatining 2022-yil 30-noyabridagi 327/5-son qarori).

4. Ahmadjonova O.A. Developing students' communicative competence on the basis of STEM educational technology: history and future // Innovative development in educational activities. Uzbekistan: Vol: 2, – № 10, 2023. – P. 162-168. (ResearchBib. №14).

5. Ahmadjonova O.A. Kompetensiya, kompetentlik tushunchalari, ilmiy sharhi va mohiyati // Til va adabiyot ta'limi. – Toshkent, 2023. – № 12. – B. 42–43. (13.00.00. №8).

6. Ahmadjonova O.A. Ingliz tili darslarida STEAM ta'lim texnologiyasi asosida o'quvchilarning nutqiy kompetensiyasini rivojlantirish usullari // Namangan davlat universiteti ilmiy axborotnomasi. – Namangan, 2024. – №1. – B. 660-665. (13.00.00; №30)

7. Ahmadjonova O.A. Ingliz tili darslarida STEAM ta'lim texnologiyalaridan foydalanib o'quvchilarning o'qish kompetensiyasini rivojlantirish metodlari // O'zbekiston Milliy universiteti xabarлари. – Toshkent, 2024. – № 1. – B. 59–62. (13.00.00; №15).

8. Ahmadjonova O.A. Methodology of developing students' reading skills based on STEAM educational technology // American Journal of Corporate Management. – USA, 2025. – № 4. – P. 18-24. (ResearchBib. №14).

9. Ahmadjonova O.A. Why STEM learning is important in English learning // "Raqamli texnologiyalarning yangi O'zbekiston rivojiga ta'siri" mavzusidagi xalqaro ilmiy–amaliy konferensiya materiallari to'plami. – Farg'ona, 2023-yil 21-iyun. – B. 61-64.

10. Ahmadjonova O.A. Yuqori sinflarda STEAM ta'lim texnologiyasi asosida o'quvchilarning ingliz tilida o'qish kompetensiyasini rivojlantirishda tayyorlov mashqlarining ahamiyati // "Ko'p tillilik muhitida xorijiy tillarni rivojlantirishning

innovatsion va integrativ muommolari” mavzusidagi xalqaro ilmiy–amaliy konferensiya materiallari to‘plami. – Toshkent, 2024-yil 22-may. – B. 51-56.

11. Ahmadjonova O.A. Relationship between STEM learning and English learning // “Yangi O‘zbekistonda yoshlarga oid davlat siyosatini amalga oshirish strategiyasi: mavjud vaziyat va rivojlantirish istiqbollari” mavzusidagi respublika ilmiy–amaliy konferensiya materiallari to‘plami. – Toshkent, 2023-yil 23-iyun. – B. 352-355.

12. Ahmadjonova O.A. Ingliz tili darslarida STEAM ta’lim texnologiyasini qo‘llash jarayonlarida uchraydigan muammolar // “Yangi O‘zbekiston: Ilmiy tadqiqotlar” mavzusidagi respublika ko‘p tarmoqli ilmiy konferensiya materiallari to‘plami. – Toshkent, 2025-yil 29-sentabr. – B. 114-116.

II bo‘lim (part II; часть II)

13. Ahmadjonova O.A. Rivojlangan mamlakatlar hamda O‘zbekiston ta’lim siyosatida STEAM ta’lim texnologiyalarining o‘rni // “Ta’lim tizimida innovatsiya, integratsiya va zamonaviy pedagogik texnologiyalar” mavzusidagi xalqaro ilmiy–amaliy konferensiya materiallari to‘plami. – Namangan, 2024-yil 18-19-aprel. – B.235-239.

14. Ahmadjonova O.A. Yuqori sinflarda STEAM ta’lim texnologiyasi asosida o‘quvchilarning ingliz tilida o‘qish malakasini rivojlantirishga doir xorijiy tajribalar // “Ilm–fan va innovatsiya–2024” mavzusidagi xalqaro ilmiy–amaliy konferensiya materiallari to‘plami. – Toshkent, 2024-yil 25-aprel. – B. 56-59.

15. Ahmadjonova O.A. STEAM ta’lim texnologiyasi asosida o‘quvchilarning ingliz tilida o‘qish kompetensiyasini rivojlantirishda nutqiy mashqlarning o‘rniga doir // “Raqamlashtirilgan ta’lim muhitida tillar o‘qitish va lingvokulturologiyaning dolzarb masalalari: muommo va yechimlar” mavzusidagi xalqaro ilmiy–amaliy konferensiya materiallari to‘plami. – Jizzax, 2024-yil 17-may. – B. 233-239.

Avtoreferatning o‘zbek, rus va ingliz tillaridagi nusxalari
Namangan davlat universitetining “Ilmiy axborotnoma” jurnali
tahririyatida tahrirdan o‘tkazildi.
(10.11.2025-yil)

Bosishga ruxsat etildi: 05.11.2025-yil.
Bichimi 60x84 1/16 Hajmi 3,4 bosma taboq.
Times New Roman garniturasida. Ofset usulida bosildi.
Buyurtma raqami –249, Adadi 60 nusxa.

“Vodiy Poligraf” MCHJ bosmaxonasida chop etildi.
Namangan sh., 5-kichik tuman, G‘alaba ko‘chasi, 19-u