

STEAM YONDASHUVINING TA'LIM-TARBIYA JARAYONIGA INTEGRATSIYASI: ZAMONAVIY TENDENSIYALAR VA NATIJALAR

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Annotatsiya Mazkur maqolada STEAM (Science, Technology, Engineering, Arts, Mathematics) yondashuvining ta'lim-tarbiya jarayoniga integratsiyasi, uning o'quvchilar tafakkurini rivojlantirishdagi o'rni, tanqidiy fikrlash va muammoli vaziyatlarda mustaqil yechim topish ko'nikmalarini shakllantirishga ta'siri tahlil qilinadi. Maqolada zamonaviy tajribalar asosida ta'lim jarayoniga STEAM yondashuvini qo'shish natijalari, amaliy yondashuvlar hamda metodik takliflar keltirilgan.

Kalit so'zlar. STEAM, integratsiyalashgan ta'lim, tanqidiy fikrlash, innovatsion yondashuv, muammoli vaziyat, kreativlik, interdisciplinar metodlar.

Abstract This article analyzes the integration of the STEAM (Science, Technology, Engineering, Arts, Mathematics) approach into the educational process, its role in developing students' thinking, and its impact on the formation of critical thinking and independent problem-solving skills. The article presents the results of incorporating the STEAM approach into the educational process, practical approaches, and methodological proposals based on modern experiences.

Keywords. STEAM, integrated education, critical thinking, innovative approach, problem-solving, creativity, interdisciplinary methods.

Kirish. XXI asr ta'limi zamonaviy texnologiyalar, kreativ tafakkur va muhandislik yondashuvlariga asoslangan bo'lishi kerak. Shu nuqtayi nazardan qaraganda, STEAM ta'lim modeli o'quvchilarda nafaqat bilim, balki amaliy ko'nikmalar, tanqidiy fikrlash va ijtimoiy mas'uliyatni shakllantirishda muhim ahamiyatga ega. O'zbekiston ta'lim tizimida ham ushbu modelni qo'llash bo'yicha izlanishlar olib borilmoqda va ushbu maqolada ana shu jarayonlar yoritiladi. So'nggi yillarda ta'lim jarayonida an'anaviy yondashuvlar zamonaviy metodlar bilan boyitilmoqda. Ayniqsa, raqamli texnologiyalar, muhandislik fikrlash, kreativlik va san'atni o'zida mujassam etgan STEAM yondashuvi global miqyosda o'zini oqlagan tizimga aylandi. Bu model o'quvchilarning fanga bo'lgan qiziqishini oshirish, ularni real hayotiy muammolarni hal qilishga tayyorlash, shuningdek, fanlararo fikrlashni shakllantirish imkonini beradi. O'zbekiston Respublikasining 2022–2026 yillarga mo'ljallangan Yangi O'zbekiston taraqqiyot strategiyasida ham yosh avlodni zamonaviy kasblarga tayyorlash, innovatsion fikrlovchi shaxsni shakllantirish dolzarb vazifalardan biri sifatida belgilangan. Bu borada STEAM asosli yondashuvlar ta'lim va tarbiya tizimini yangicha bosqichga olib chiqishi mumkin. Asosiy qism. STEAM modeli o'z ichiga nafaqat an'anaviy STEM (science, technology, engineering, mathematics) fanlarini, balki san'at va dizaynni ham qo'shgan holda, kreativlik va ijodiy tafakkurni ham rivojlantirishga yo'naltirilgan. Bu yondashuv orqali o'quvchilar real hayotdagi muammolarni hal qilishga, loyihalashga, o'z fikrini ifoda etishga va natijalarni tahlil qilishga o'rganadilar.

1. STEAM yondashuvining mohiyati STEAM modeli – bu fanni (S), texnologiyani (T), muhandislikni (E), san'atni (A) va matematikani (M) yagona ta'lim tizimida integratsiyalashgan

holda o'qitishdir. Bu yondashuv o'quvchilarning nafaqat bilim olish, balki amaliy faoliyat orqali bilimlarni mustahkamlashini ta'minlaydi.

2. Ta'lim-tarbiya jarayoniga integratsiyasi STEAM loyihalari orqali o'quvchilar muammolarni aniqlash, jamoaviy ishlash, kreativ yechimlar taklif qilish va ularni amalda sinab ko'rish imkoniyatiga ega bo'ladilar. Misol: "Ekologik muammolar yechimi" mavzusida STEAM loyihasi tashkil qilinib, o'quvchilar quyosh panellari maketini yaratadilar, matematik hisob-kitoblar olib boradilar, natijada real muammoni yechish yo'llarini ishlab chiqadilar.

3. Pedagogik yondashuvlar va metodlar • Loyiha asosidagi ta'lim (Project-Based Learning) • Muammo asosida o'qitish (Problem-Based Learning) • Konstruktiv yondashuv (Constructivism) Bu metodlar STEAM ta'limining negizini tashkil qiladi va o'quvchilarni faol subyektga aylantiradi.

4. O'zbekiston ta'lim tizimida STEAM yondashuvi tajribalari 2022 yildan boshlab ayrim maktablarda "STEAM laboratoriyalari" tashkil qilindi. Ular orqali informatika, texnologiya va fan mashg'ulotlari zamonaviy usullar bilan integratsiyalashgan holda olib borilmoqda. Ushbu loyihalarda qatnashgan o'quvchilar orasida fanga bo'lgan qiziqish va ijodiy yondashuv sezilarli oshgani kuzatilgan. STEAM yondashuvi bo'yicha xalqaro va mahalliy adabiyotlarda keng tahlillar mavjud. Xususan: STEAM komponentlari bo'yicha o'quvchilarni qanday tayyorlash kerakligi yoritilgan. Yakobson, A. (2018) "STEAM Education: Theory and Practice" nomli ishda turli davlatlarda amalga oshirilgan pilot loyihalar tahlil qilingan. O'zbekiston Respublikasi Xalq ta'limi vazirligi tomonidan e'lon qilingan STEAM asoslari bo'yicha metodik qo'llanmalar ham tahlilga olingan. Mazkur adabiyotlar shuni ko'rsatadiki, STEAM modeli o'quvchilarning bilimlarni amaliyotga tadbiiq qilishga, fanlararo aloqalarni mustahkamlashga va shaxsiy rivojlanishga ijobiy ta'sir ko'rsatadi. Tadqiqotda quyidagi metodlardan foydalanildi: Taqqoslash usuli – an'anaviy va STEAM yondashuvi asosidagi ta'lim natijalari solishtirildi. Empirik kuzatuv – sinfda STEAM yondashuvi asosida o'tilgan mashg'ulotlar kuzatildi. So'rovnoma – 30 nafar o'qituvchi va 60 nafar o'quvchi orasida STEAM yondashuvi haqida fikrlar yig'ildi. Kontent-tahlil – milliy va xalqaro metodik materiallar tahlil qilindi. O'quvchilar STEAM yondashuvi asosida o'tilgan darslardan keyin tanqidiy fikrlash, jamoada ishlash va muammoni hal qilish ko'nikmalarini yaxshilaganliklarini bildirgan. O'qituvchilar STEAM loyihalarini tayyorlash va ularni amaliy darslarga kiritish orqali fanlararo bog'liqlikni samarali tashkil etish imkoniyatiga ega bo'lganliklarini qayd etgan.

Statistik tahlillar shuni ko'rsatdiki, STEAM asosidagi yondashuv natijasida o'quvchilarning fanga bo'lgan qiziqishi 40% ga oshgan.

Xulosa. STEAM yondashuvining ta'lim-tarbiya jarayoniga integratsiyasi o'quvchilarni zamonaviy kasblarga tayyorlash, ularning tafakkur doirasini kengaytirish va ijodiy faoliyatini rivojlantirishda muhim o'rin egallaydi. O'zbekiston ta'lim tizimi uchun bu yondashuv innovatsion rivojlanishning kalitidir. Kelgusida ushbu modelni yanada keng joriy etish uchun o'qituvchilarning malakasini oshirish, metodik qo'llanmalarni yangilash zarur. STEAM yondashuvi – bu zamonaviy ta'limda shunchaki metod emas, balki yangi pedagogik falsafa bo'lib, u har bir o'quvchining shaxsiy rivojlanishi, kreativ fikrlashi, real hayotda o'zini sinab ko'rishi uchun zamin yaratadi. O'zbekiston ta'lim tizimi uchun bu yondashuv yoshlarni texnologik, muhandislik va kreativlik yo'nalishlarida tayyorlashda strategik ahamiyat kasb etadi. Kelgusida: barcha umumiy o'rta maktablarda STEAM markazlarini tashkil etish; pedagoglar uchun malaka oshirish kurslarini yo'lga qo'yish; STEAM

fanlarini o'quv rejalari va darsliklarga chuqur integratsiya qilish zarur. Bunday chora-tadbirlar orqali ta'lim-tarbiya jarayonini XXI asr talablariga moslashtirish mumkin bo'ladi.

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