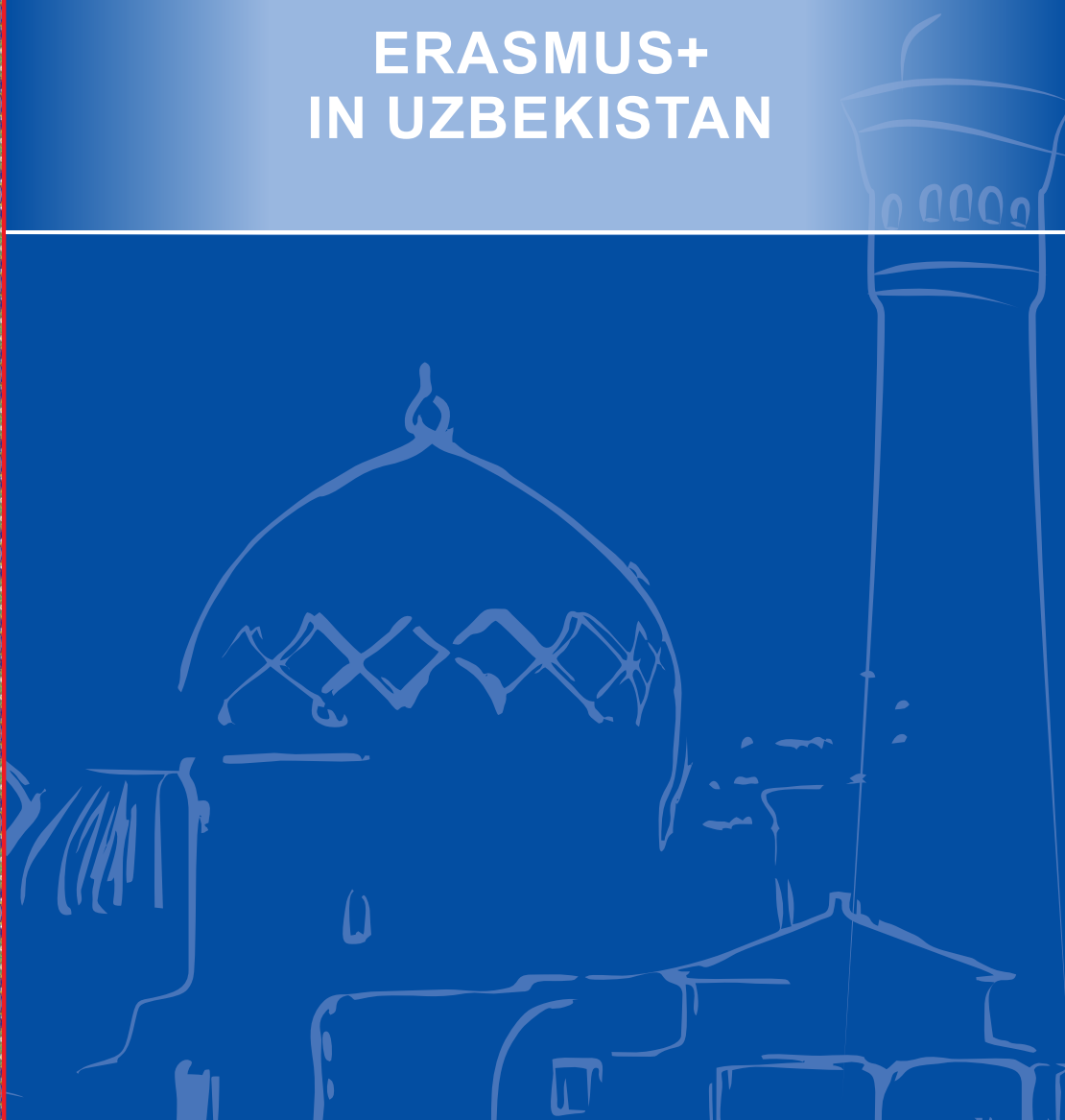




with the support of the  
Erasmus+ Programme  
of the European Union

# ERASMUS+ IN UZBEKISTAN



Tashkent - 2021

# **ERASMUS+ IN UZBEKISTAN**

Tashkent - 2021

Prepared by the National Erasmus+ Office in Uzbekistan

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The conclusions and views expressed herein are those of the authors and do not necessarily reflect an official view of the European Commission

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томонидан молиялаштирилган

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## Кириш

Ушбу тўплам Erasmus+ “Олий таълимда салоҳиятни ошириш-СВНЕ” лойиҳалари иштирокчиларининг ҳар йиллик мақолалар тўпламининг 10-чи сони чиқарилмоқда. Тўпламда Ўзбекистонда дастурнинг фаолияти, республикамиз олий таълим муассасалари (ОТМ) ва Европа Иттифоқига аъзо давлатларнинг университетлари билан ҳамкорликда олиб борилаётган кўп сонли лойиҳалар доирасидаги илғор тажрибалар ва эришилган натижалар билан таништиришдан иборат.

2021 йилда январь ойида VI-чи танлов доирасида бта янги лойиҳа амалга оширилиши бошланди. 6-чи танлов натижасида Марказий Осиёнинг 5та давлатлари учун жами 15та янги лойиҳалари, шу жумладан Ўзбекистон учун бта лойиҳа молиялаштирилмоқда. Таъкидлаш жоизки, республиканинг 12та олий таълим муассасалари, жумладан 5та ОТМ Тошкент шаҳридан, 5та вилоятлардаги 7та ОТМ иштирокида 1та миллий лойиҳа, Қозоғистон, Қирғизистон ва Тожикистон билан ҳамкорликда 4та ҳудудий лойиҳа, шунингдек Россия ва Қозоғистон университетлари иштирокида 1та минтақалараро лойиҳа амалга оширилмоқда. Дастурнинг 1-чи даврининг сўнги танлови лойиҳаларида Европанинг 15та давлатларидан 19 университет, 4 ҳамкор-давлатлардан 19 университетлар жалб қилинган.

2021 йил декабрь ойи ҳолатига кўра, Ўзбекистон олий таълим муассасалари иштирокида 43та лойиҳа молиялаштирилди, ша қаторда бта танлаб олинган лойиҳа, 18та яқунланган лойиҳа (2015 йилдаги I-чи танлов 11та лойиҳа ва 2016 йилдаги II-чи танловида 7та лойиҳа) ва 19 та амалга оширилаётган лойиҳа (2017 йилда III-чи танлов 7та лойиҳа, 2018 йилда IV-чи танловда 7та лойиҳа ва 2019 йилда V-чи танловда 5та лойиҳа).

6-чи танлови натижалари кўра, республика олий ўқув юртларининг дастурда қатнашишига бўлган қизиқишини яна бир бор намойиш этди, таққослаш учун.

Таҳририят гуруҳи умид қиладики, ушбу тўпламлар Европа Иттифоқи дастурларида иштирок этишни режалаштириганлар учун яна бир бор кўшимча ёрдам сифатида хизмат қилади, чунки тадбирлар, натижалар ва ҳамкорликда амалга оширилган ишлар ҳақида Ўзбекистон, Европа Иттифоқи ва бошқа Ҳамкор-давлатларининг лойиҳа иштирокчилари томонидан маълумотлар тақдим этилган.

Erasmus+ лойиҳаларининг самарали амалга ошириш ишларида ва олий таълимни ислохотлаштириш умумий жараёнида дастурнинг қўшган ҳиссасини ҳамда давлатимиз томонидан олий таълим соҳаси олдига қўйилган вазифаларни бажаришда Олий ва ўрта махсус таълим вазирлигининг қўллаб-қувватлашини биз жуда қадрлаймиз.

Ушбу тўпламда барча мақола ва материалларда муаллифларнинг ғоя, қарашлари, фикр ва таҳлиллари келтирилган.

Erasmus+ миллий офиси ушбу тўпламда ўз мақолаларини нашр этиш учун юборган барча лойиҳалар аъзоларига ўз миннатдорчилигини билдириб қолади.

Таҳририят гуруҳи ушбу тўпламдаги мақолаларда ҳато ва камчиликларга йўл қўйилган бўлиши мумкинлигини эътироф этади ва шу ўринда Сизда пайдо бўлган таклиф ва шарҳларингизни [book@erasmusplus.uz](mailto:book@erasmusplus.uz) электрон адресига юбориш мумкинлигини маълум қилади.

**Миннатдорчилик билан,**

**Erasmus+ миллий офиснинг редакция гуруҳи**

## **Introduction**

This brochure is the 10<sup>th</sup> edition of the annual publication of papers provided mainly by Erasmus+ CBHE project participants, which is published with a view to disseminate information about programme activities in Uzbekistan and to promote best practice and achievements of numerous cooperation projects implemented by the local universities and the European universities.

In January 2021, the implementation of 6 new projects began in the framework of the 6th Call - 2020. As a result of VI Call a total of 15 projects were selected for funding for Central Asia including 6 projects involving the higher education institutions (HEIs) of Uzbekistan. Twelve local universities (5 Tashkent HEIs and 7 HEIs from 5 country regions) are involved in one national project, four CA regional projects involving partner HEIs from Kazakhstan, Kyrgyzstan, Tajikistan and one cross-regional project in cooperation with Russian and Kazakh HEIs. Nineteen universities of 15 European countries and nineteen HEIs from 4 partner countries are represented in newly selected consortia.

As of December 2021, a total of 43 projects with the participation of Uzbek universities were financed, including 6 newly selected projects of 2020, 18 completed projects (11 projects of the 1st Call-2015 and 7 projects of the 2nd Call-2016) and 19 ongoing projects (7 projects of the 3rd Call-2017, 7 projects of the 4th Call-2018 and 5 projects of the 5th Call 2019).

The results of the 6<sup>th</sup> Erasmus+ Call for Proposals 2020 have once again demonstrated the high level of interest of the universities of Uzbekistan in participating in the programme.

The editorial board believes that this publication shall be of a great assistance to those planning to participate in the European Union's programmes since the success stories detailing specific activities, results and joint work are told first hand by participants from Uzbekistan and Partner Countries.

We highly value the support rendered by the Ministry of Higher and Secondary Specialised Education of Uzbekistan to ensure efficient implementation of Erasmus+ projects as well as the recognition of the programme's contribution to the overall modernisation of the higher education sector, implementation of government's priority objectives set for the higher education system.

All articles and materials in this compendium are the property of their respective authors along with their ideas, views, discussions and analysis.

The National Erasmus+ Office expresses its gratitude to everyone for taking time to respond and to share their articles for this compendium.

The editorial board recognises that this publication is not devoid of errors, typos and some other deficiencies and we shall therefore be grateful for any comments and suggestions to be sent to our email [book@erasmusplus.uz](mailto:book@erasmusplus.uz).

**Thank you,**

**NEO Editorial Team**

## **Введение**

Данная брошюра представляет собой десятый по счету ежегодный сборник статей в основном участников проектов Erasmus+ по развитию потенциала высшего образования (Capacity Building in Higher Education-CBHE), издаваемый в целях информирования о деятельности программы в Узбекистане и распространения передового опыта и достижений многочисленных проектов сотрудничества вузов республики с европейскими университетами.

В январе 2021 года началась реализация 6 новых проектов 6-го конкурса 2020 года. По итогам 6-го конкурса всего для 5 стран Центральной Азии профинансировано 15 новых проектов CBHE, включая 6 проектов для Узбекистана. Необходимо отметить, что с участием 12 вузов республики, включая 5 вузов Ташкента и 7 вузов из 5 областей республики, идет реализация одного национального проекта, 4 региональных проектов в партнёрстве с Казахстаном, Кыргызстаном и Таджикистаном, а также 1 межрегионального проекта с участием вузов России и Казахстана. В проектах последнего конкурса 1-го этапа программы представлено 19 университетов из 15 европейских стран, а также 19 университетов из 4 стран-партнёров.

По состоянию на декабрь месяц 2021 года всего 43 проектов с участием вузов Узбекистана было профинансировано, включая 6 проектов 2020 года, 18 завершившихся проектов (11 проектов I-го конкурса 2015 г. и 7 проектов II-го конкурса 2016 года) и 19 текущих проектов (7 проектов III-го конкурса 2017 года, 7 проектов IV-го конкурса 2018 года и 5 проектов V-го конкурса 2019 года).

Редакционная коллегия надеется, что и в очередной раз данная публикация послужит хорошим подспорьем для тех, кто планирует участвовать в программах Европейского Союза, так как о конкретных мероприятиях, результатах и совместной работе рассказывают сами участники проектов из университетов Узбекистана, Европы и других стран-партнёров.

Мы высоко ценим поддержку Министерства высшего и среднего специального образования Республики Узбекистан в эффективной реализации проектов Erasmus+, а также признание вклада программы в реформирование высшего образования и в реализацию государственных задач, поставленных перед системой высшего образования.

Все статьи и материалы в данном сборнике принадлежат авторам с их идеями, взглядами, рассуждениями и анализом.

Национальный офис Erasmus+ выражает большую благодарность всем, кто откликнулся на предложение предоставить свои статьи для данного сборника.

Редакционная коллегия признает, что данное издание не лишено ошибок, опечаток и некоторых других недостатков, поэтому будет благодарна за любые комментарии и предложения, отправленные на наш электронный адрес: [book@erasmusplus.uz](mailto:book@erasmusplus.uz).

**С благодарностью,  
Редакционная коллегия НЕО**



## **Erasmus+ loyihalari O'zbekiston Respublikasining oliy ta'limini rivojlantirish va modernizatsiyasiga oliy ta'lim salohiyatini oshirishdagi ta'siri haqidagi hisobotining qisqacha mazmuni**

Erasmus+ loyihalari O'zbekiston Respublikasining oliy ta'limini rivojlantirish va modernizatsiyasiga oliy ta'lim salohiyatini oshirishdagi ta'siri haqidagi hisobotining qisqacha mazmuni 2020 yil noyabr-dekabr oylarida onlayn savolnoma, ekspertlar bilan suhbatlar, fokus-guruhlar, O'zbekistondagi Erasmus+ milliy ofisi tomonidan joylarda tashkil etilgan monitoring uchrashuvlari (Field Monitoring) hamda institutsional monitoring uchrashuvlari (Institutional Monitoring) natijalarining tahlili asosida Tempus va Erasmus+ dasturlarining tadqiqoti olib borildi. Erasmus+ dasturi O'zbekistondagi yagona va Yevropa Ittifoqi universitetlari bilan hamkorlik doirasida oliy ta'limining rivojlanishi va modernizatsiyasiga tizimli ta'sir ko'rsatgan o'ziga xos va yagona dasturlaridan biridir. Ushbu xulosa 2020 yil 19-20 noyabr kunlari bo'lib o'tgan Erasmus+ CBHE loyihalarining ta'sirini o'rganishga bag'ishlangan mintaqaviy klaster yig'ilishining hisobotida ham o'z aksini topdi.

Dasturning oliy ta'lim sohasidagi islohotlarni amalga oshirishga va tizimni modernizatsiya qilish bo'yicha Hukumat qarorlariga o'z vaqtida javob berishi va ta'siri bo'yicha 2015 yil CBHE loyihalarining birinchi avlodi yakuniy hisobotlarini tahlil qilish asosida Yevropa ta'limi va madaniyat bo'yicha Ijroiya agentligi (EACEA) tomonidan tayyorlangan Markaziy Osiyo bo'yicha mintaqaviy hisobotida ham tasdiqlangan. Bundan tashqari, Tempus va Erasmus+ dasturlari O'zbekiston Respublikasi Oliy va o'rta maxsus ta'lim vazirligi tomonidan, shuningdek Sog'liqni saqlash, Qishloq xo'jaligi, suv resurslarini boshqarish, Tashqi ishlar, Innovatsion rivojlanish kabi boshqa tarmoq vazirliklari va idoralari tomonidan yuqori baholandi.

Biroq, tadqiqotni o'rganish davrida loyiha komanda a'zolari Erasmus+ loyihalarini amalga oshirishda duch kelgan bir qator qiyinchiliklar va muammolar mavjudligi aniqlandi. Tadqiqot ishtirokchilarining chiqishlari va so'rovnomalarida qayd etgan qiyinchiliklar va muammolar ham tizimli, ham yakka xarakterga ega edi.

Tadqiqotda qatnashgan barcha ekspertlar va respondentlarning ta'kidlashicha, Tempus va Erasmus+ loyihalarining ta'sirisiz 2017-2020 yillarda O'zbekistondagi oliy ta'limning bunday zamonaviy modernizatsiyasiga, ayniqsa, yangi va ko'pincha innovatsion ta'lim sohalarida erishish qiyinchilik tug'dirishi mumkinligini qayd etdi.

Umuman olganda, rahbarlar Tempus va Erasmus+ loyihalarini amalga oshirish uchun yagona qizil chiziqqa ega ekanligini ta'kidladi. Ushbu yo'nalish 1994 yildan beri Tempus dasturi doirasida loyihalarining oliy ta'lim tizimini isloh qilish va modernizatsiyalashga hamda salohiyatni oshirishga ta'sirining boshidanoq aniq olib borilmoqda.

2015 yildan boshlab, u Erasmus+ dasturi yordamida ushbu o'zgarishlarning natijalarini oliy ta'lim tizimiga joriy etish va keng ommaga yetkazish nuqtai nazaridan davom etib kelmoqda. Gap shundaki, loyihalar ta'siri kelajakdagi Erasmus

dasturi (2021-2027) yordamida milliy oliy ta'lim tizimining innovatsionligi va raqobatbardoshligini oshirishga xizmat qiladi.

Bundan tashqari, 2017-2020 yillar mobaynida O'zbekistondagi universitetlar sonining tubdan ko'payishi (2017 yilda 60 tadan, 2020 yil oxirida 129 taga), shu jumladan chet el universitetlari filiallari va ko'plab nodavlat va xususiy universitetlarning paydo bo'lishi, shuningdek, Tempus va Erasmus+ loyihalarida qatnashgan va malaka oshirgan xodimlar yordami katta ahamiyatga ega ekanligi tan olish muhim.

Tempus va Erasmus+ dasturlarining ta'sirini o'rganish davomida ko'plab ishtirokchilar loyihalarda ishtirok etishdagi qiyinchiliklar va muammolarning oldini olish bo'yicha bir qator fikr va tavsiyalar bilan bo'lishdi, ammo qayd etilgan barcha muammolar erishilgan natijalar va dasturning ta'siri, ularning individual kasbiy rivojlanishiga, kafedralar va universitetlarning salohiyatini kuchaytirishga, shuningdek mintaqaviy va milliy darajadagi tizimli ta'siri bilan belgilandi.

Shuningdek, Oliy ta'lim bo'yicha ekspertlar Milliy guruhi a'zolari tomonidan ushbu hisobotga ilova sifatida 6 ta tahliliy ma'lumot tayyorladi.

2017 yildan 2020 yilgacha bo'lgan davrda amalga oshirilgan islohotlarga bag'ishlangan CBHE loyihalarining kelajakdagi milliy va mintaqaviy ustuvor yo'nalishlarini aniqlash bo'yicha qaror qabul qilishga imkon berdi, shuningdek 2030 yilgacha O'zbekiston Respublikasida rivojlanish yo'nalishlarini tavsiflovchi quyidagi dolzarb mavzular oshkor qilindi: davlat boshqaruvi va iqtisodiyot; oliy ta'lim sohasidagi islohotlar; ilm-fan va innovatsiyalar sohasida; qishloq xo'jaligi va sog'liqni saqlash.

Har bir tahliliy ma'lumotda Erasmus+ CBHE loyihalarining qisqacha tavsiflari va web-saytlari ko'rsatilgan, shuningdek ularning amalga oshirish davomida erishilgan asosiy natijalar ro'yxati taqdim etilgan.

Tadqiqot mualliflari COVID-19 koronavirus pandemiyasi paytida O'zbekistondagi Erasmus+ loyihalarini amalga oshirishning ba'zi jihatlarini e'tiborsiz qoldirmadi. Onlayn so'rov o'tkazildi va mutaxassislar bilan suhbatlar va fokus-guruhlar davomida tegishli masalalar muhokama qilindi. Ushbu tadqiqotning umumiy xulosasi, Erasmus+ loyihalari, xususan mobillik bilan bog'liq vazifalar va tadbirlarga davlat tomonidan qo'llanilgan karantin choralarining juda jiddiy ta'sirini ko'rsatdi.

Shunga qaramay, hamkorlik va loyihalarni amalga oshirish davom etdi va faqat alohida holatlarda loyihalar faoliyati to'liq tugatildi. Erasmus+ dasturi doirasidagi barcha manfaatdor tomonlarning, shu jumladan yevropalik hamkorlar, OO'MTV va Erasmus+ milliy ofisining har tomonlama ko'magi respondentlar tomonidan to'liq his qilinganligi va yuqori baholanganligini o'rganish juda muhimdir.

Ushbu tadqiqotning formati tahlil natijalarning butun spektrini joylashtirishga imkon bermaydi, ammo eng ko'zga ko'ringan fikrlar, muammolar va tavsiyalar ko'rsatildi.

**Краткое содержание отчета  
ПРОМЕЖУТОЧНОГО ИССЛЕДОВАНИЯ  
влияния проектов Erasmus+ по повышению потенциала высшего  
образования на развитие и модернизацию высшего образования  
Республики Узбекистан**

Программы Темпус и Erasmus+ согласно проведенному исследованию, основанному на анализе онлайн анкетирования, глубинного экспертного интервью, фокус-групп, проведенных в ноябре-декабре 2020 года, а также на анализе мониторингов на местах (Field monitoring) и институциональных мониторингов (Institutional Monitoring) Национального офиса Erasmus+ в Узбекистане (NEO) являются единственными в своем роде и самыми масштабными программами сотрудничества с университетами ЕС, которые оказали системное воздействие на развитие и модернизацию высшего образования Республики Узбекистан. Данное заключение также было отражено в отчете регионального кластерного совещания по изучению воздействия проектов Erasmus+ СВНЕ, прошедшего 19-20 ноября 2020 года в формате он-лайн<sup>1</sup>.

Значительное влияние программы на реализацию реформ в сфере высшего образования и своевременное реагирование на правительственные решения по модернизации системы подтверждено и в региональном отчете по Центральной Азии<sup>2</sup>, подготовленном Исполнительным агентством по образованию, аудиовизуальным средствам и культуре (ЕАСЕА) на основе анализа итоговых отчетов первого поколения проектов СВНЕ 2015 года. Более того программы Темпус и Erasmus+ были высоко оценены как Министерством высшего и среднего специального образования Республики Узбекистан, так и другими отраслевыми министерствами, и ведомствами, такими как Министерства здравоохранения, сельского хозяйства, управления водными ресурсами, иностранных дел, инновационного развития и других.

Тем не менее, в период проведения исследования был выявлен ряд вызовов и трудностей, с которыми проектные команды сталкивались во время реализации проектов Erasmus+. Трудности и вызовы, отмеченные участниками исследования в своих выступлениях и анкетах, носили как системный, так и единичный характер, которые участники исследования отметили в своих выступлениях и анкетах.

Все эксперты и респонденты, участвовавшие в исследовании, отметили, что без воздействия проектов Темпус и Erasmus+ такой

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<sup>1</sup> [https://erasmusplus.kg/ca\\_cluster\\_meeting/](https://erasmusplus.kg/ca_cluster_meeting/)

<sup>2</sup> <https://op.europa.eu/en/publication-detail/-/publication/39eb35f5-40e0-11eb-b27b-01aa75ed71a1/language-en>

стремительной модернизации высшего образования в Узбекистане за 2017-2020 годы вряд ли бы удалось достичь, в особенности по новым и зачастую инновационным направлениям образования.

В целом, у лидеров мнений прослеживается единая красная линия реализации проектов Темпус и Erasmus+. Эта линия четко ведет от начала воздействия проектов на реформирование и модернизацию системы высшего образования и накопления потенциала в рамках программы Темпус с 1994 года. Далее с 2015 года она продолжается в плане внедрения и распространения результатов этих изменений в системе высшего образования благодаря программе Erasmus+. И подходит к точке, где ожидается воздействие проектов на повышение инновационности и конкурентоспособности национальной системы высшего образования при содействии нового этапа программы Erasmus (2021-2027).

Более того, радикальное увеличение количества вузов в Узбекистане за период 2017-2020 (с 60 в 2017 году до 129 на конец 2020 года), включая филиалы зарубежных университетов, и появление большого количества негосударственных, частных вузов, происходило также благодаря кадрам, прошедшим подготовку и принимавшим участие в проектах Темпус и Erasmus+.

В процессе проведения исследования<sup>3</sup> о влиянии программ Темпус и Erasmus+ многие участники поделились целым рядом замечаний и рекомендаций по профилактике трудностей и вызовов по участию в проектах, но все отмеченные проблемы нивелировались достигнутыми результатами и воздействием программы на их индивидуальное профессиональное развитие, на усиление потенциала кафедр и вузов, а также системным воздействием на уровне региона и страны.

Также членами Национальной команды экспертов в области развития высшего образования были подготовлены 6 аналитических записок, включенных в приложение к данному отчету. Были раскрыты следующие актуальные темы, позволяющие принять решение по определению будущих национальных и региональных приоритетов по проектам СВНЕ, а также описывающие направления развития в Республике Узбекистан до 2030 года, сфокусированные на текущие реформы в период с 2017 по 2020 годы: структурные преобразования в государственном управлении и экономике; реформы в высшем образовании; в области науки и инноваций; в сельском хозяйстве и здравоохранении.

В контексте каждой аналитической записки были представлены краткие описания проектов Erasmus+СВНЕ с указанием веб-сайта, а также

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<sup>3</sup> National Impact Study - [http://www.erasmusplus.uz/images/shared/file/NIS%20EN%20\\_for\\_printing.pdf](http://www.erasmusplus.uz/images/shared/file/NIS%20EN%20_for_printing.pdf)

перечня основных результатов, которые были достигнуты в ходе их реализации.

Авторы исследования не обошли своим вниманием некоторые аспекты реализации проектов Erasmus+ в Узбекистане во время пандемии коронавируса COVID-19. Было проведено онлайн анкетирование и обсуждены соответствующие вопросы во время проведения экспертных интервью и фокус групп. Общий вывод данного исследования в целом показал достаточно серьезное влияние предпринятых государствами карантинных мер на проекты Erasmus+, в особенности на задачи и мероприятия, связанные с мобильностью. Тем не менее, сотрудничество и реализация проектов продолжались, и только в единичных случаях деятельность проектов была полностью прекращена. Особенно важно было узнать, что всесторонняя поддержка всех заинтересованных сторон в рамках программы Erasmus+, включая европейских партнеров, МВССО и Национального офиса Erasmus+ полноценно ощущалась и высоко оценивалась респондентами.

Министерством высшего и среднего специального образования (МВССО) Республики Узбекистан неоднократно выражалась поддержка деятельности программы Erasmus+ и была дана высокая оценка её значительному влиянию на процесс реформирования, отмечалась гибкость и своевременное конструктивное реагирование на все правительственные решения по дальнейшему совершенствованию системы высшего образования республики.

## EVALUATION AND RESULTS OF THE DSINGIS PROJECT

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### **Abstract**

The DSinGIS project aimed to produce a PhD programme in Geoinformation Sciences (GISc) in the Uzbek education system. It has resulted an accredited doctoral school in the field of GISc, developed its program, defined the requirements, and provided supportive teaching and learning materials in English and/or Uzbek. In addition, the educational capacity of 5 leading Uzbek universities has been advanced by training of more than 70 Uzbek staff members, by allowing 15 PhD students to visit EU for research purposes and by creating a Knowledge Centre at each Uzbek partner universities containing an e-learning platform with a jointly developed knowledge pool. A Joint Research Centre has been set up to facilitate research cooperation within the Uzbek GIS society. Numerous trainings, workshops, winter schools and 4 scientific conferences have been organized and held for the benefit of Uzbek GIS professionals and the academic sector in general. The present paper provides an overview of all activities and results of the project.

### **Аннотация**

Целью проекта DSinGIS было создание докторской программы в области геоинформационных наук (ГИС) в системе образования Узбекистана. В результате была создана аккредитованная докторская школа в области ГИС, разработана ее программа, определены требования и предоставлены вспомогательные учебные материалы на английском и / или узбекском языках. Кроме того, образовательный потенциал 5 ведущих узбекских

университетов был расширен за счет обучения более 70 узбекских сотрудников, позволив 15 аспирантам посетить ЕС с исследовательскими целями и создав Центр знаний в каждом узбекском партнерском университете, содержащий электронная платформа обучения с совместно разработанным пулом знаний. Создан совместный исследовательский центр для содействия исследовательскому сотрудничеству в рамках узбекского сообщества ГИС. Для узбекских специалистов по ГИС и академического сектора в целом были организованы и проведены многочисленные тренинги, семинары, зимние школы и 4 научные конференции. В настоящем документе представлен обзор всех мероприятий и результатов проекта.

## **1. Introduction**

GeoInformation Science (GISc) is a relatively young science, however, has its roots thousands of years. It integrates three traditional geosciences (firstly, geodesy as the science of precise spatial data acquisition; secondly, geography as the science of studying human and physical aspects; finally, cartography as the science of making maps). The integration of these sciences is based on the rapidly evolving computer science. The methods of GISc are widely applied in other sciences, essential in decision making for sustainable development. GISc provides the theoretical foundation of handling geo-related (ie. spatially referenced) digital spatial data acquired primarily by satellite-borne methods. As a result, GISc delivers an essential tool for interpreting, visualizing and analysing measurements of Earth Observation satellite missions, such as Remote Sensing. It makes use of the methods of geospatial analysis and modelling, information systems design, geocomputation and geovisualization.

There are several challenges in Uzbekistan, where GISc may efficiently support solutions, for such issues as climate change, land degradation, heavy use of agrochemicals, diversion of huge amounts of irrigation water from the two main rivers of the region, water scarcity, the chronic lack of water treatment, e.g. Aral Sea, or the growing threat to air quality [Markus et al. 2020]. However, a number of experts and students in the GI domain is limited compared to the existing needs. This includes, for example, fields such as Geographic Information System/Science, Digital Cartography, Remote Sensing, and Photogrammetry (Akbarov et al. 2014; Gong et al. 2017; Mobaheri et al. 2014; Prüller et al. 2009).

With the coordination of the Óbuda University, an Erasmus+ Capacity Building in Higher Education, Key Action 2 project is conducted named Doctoral Studies in GeoInformation Sciences (abbreviated as DSinGIS). The wider aim of the project is to support Uzbekistan in sustainable development by GISc. The objectives envisaged with the project is to establish a missing puzzle from the Uzbek educational system after the MSc level has been completed and before the DSc is targeted. The project established an accredited Doctoral School in the field of GISc, developed its programme, defined the requirements, advanced supporting teaching and learning materials in English or Uzbek languages, all

developed in accordance to international standards and in accordance to the Uzbek education system.

As a support for the new Doctoral programme, a network of activities is conducted to improve the educational and research capacity of the Uzbek society. Among these activities, an international network of the 5 leading Uzbek universities is established. Also, their education capacity is developed by creating a Knowledge Centre at each Uzbek universities containing an e-learning platform with a jointly developed knowledge pool. The knowledge pool is also supporting research activity of future PhD students. Furthermore, a Joint Research Centre, 5 research labs have been developed to improve the research capacity of PhD programmes. Finally, annual GI conferences, trainings, workshops, and a Winter School were organized to provide a platform for presenting research results.

As a consequence of the COVID-19 pandemic, certain activities could have not been completed according to the schedule, which resulted in the extension of the project period by 6 months. These activities were the development of a Joint Research Centre, the organization of the Winter School (which was planned to be a Summer School but could have been organized later in the winter of 2020-2021), and the visiting research in the EU of 7 Uzbek PhD students. Making use of the extension, all activities were completed.

For up-to-date information on the DSinGIS project, visit the website at <http://www.dsingis.eu/home/>, which can be reached by the QR code on Figure 3 as well. Also, actual tasks and challenges of project implementation can be reached at [Markus B. et al., 2017]. Additionally, a notable number of papers has been published for disseminating the project results [see Márkus et al., 2020; Balázsik et al., 2020; Földváry et al., 2020a; Földváry et al., 2020b; Hennig and Abdurahmanov, 2020; Abdurahmanov and Isakov, 2020; Hofman et al., 2020; Pintér and Abdullaev, 2020;].



**Figure 1. QR code of the dsingis.eu webpage**

The DSinGIS project shows synergies with other EU-funded project like “Furthering the Quality of Doctoral Education at Higher Education Institutions in Uzbekistan” (<http://www.uzdoc.eu/>), “Environmental Protection in Central Asia - Disaster Risk Management with Spatial Methods” (<http://eu-epca.eu/>) and “Sustainable development in rural areas of Uzbekistan” (<http://www.uzruraldev.eu/en>) projects.

The key activities were structured into work packages and summarized as follows:



- WP1 Project management. The aim of this work package is to support the project implementation both technically and financially; the next chapter is giving a brief outline about it.
- WP2 Programme planning. It designed for the preparation of the new doctoral programme. The necessary documentation for the accreditation provided by the end of Year1.
- WP3 Learning material development. This work package was used WP2 as a starting point and developed further with the specification, preparation, testing and fine tuning of learning materials. The learning outcomes were carefully monitored. After refinement course materials are placed into a Knowledge Pool (KP) and taught in the UZ partner institutions.
- WP4 Learning infrastructure development. The project intended to provide doctoral candidates with high quality GI software and hardware in DSinGIS timeframe and beyond. A Joint Research Centre (JRC) was installed (at TIAME) on the top of an advanced IT platform, which connects all partners.
- WP5 Glossary of geospatial terms. It aimed to develop a contemporary and concise glossary of GISc related terms for the benefit of Uzbek GI community.
- WP6 Competence development. The aim of this work package was to improve the knowledge, skills and competences of related UZ staff regarding management, administration, supervision and mentoring in doctoral studies.
- WP7 Regular scientific conferences. In scientific life attendance in conferences has very high importance for early stage researchers, as it can be a good opportunity to have some feedback out of the doctoral school on their research results.
- WP8 Quality management. Our recognition that the active and critical engagement of our academic staff is central to the fulfilment of our project objectives. Chapter 3 is dealing with these issues.
- WP9 Dissemination and exploitation. Dissemination Plan and Exploitation Plan were prepared and accepted during the Kick-off meeting and executed during the project. The activities are summarized in Chapter 4.

## **2. The Consortium**

The project is implemented in an international cooperation of 9 higher education institutes (HEI) additionally to the 3 ministerial institutions contributing as associated partners. The majority of the consortium is Uzbek HEIs consisting of all relevant universities in the field of Geoinformatics. The list of the involved institutions is summarized in Table I.

**Table 1. The DSinGIS consortium**

<b>Partners</b>		
<i>HEI</i>	<i>abbr.</i>	<i>Country</i>
Obuda University	OU	Hungary
Paris Lodron University of Salzburg	PLUS	Austria
Royal Institute of Technology	KTH	Sweden
Leibniz Institute of Agricultural Development in Transition Economies	IAMO	Germany
Tashkent Institute of Irrigation and Agricultural Mechanization Engineers	TIIAME	Uzbekistan
National University of Uzbekistan named after Mirzo Ulug'bek	NUU	Uzbekistan
Karakalpak State University named after Berdakh	KSU	Uzbekistan
Samarkand State Architectural and Civil Engineering Institute	SamSACEI	Uzbekistan
Tashkent Institute of Architecture and Construction	TIAC	Uzbekistan
<b>Associated partners</b>		
	<i>abbr.</i>	<i>Country</i>
State Committee of Republic of Uzbekistan on Land Resource	GKZGDK	Uzbekistan
Ministry of Higher and Secondary Specialized Education	MHSS E	Uzbekistan
Supreme Attestation Commission under the Cabinet of Ministers	SAC	Uzbekistan

### **3. Establishment of the Doctoral Programme**

The DSinGIS project focuses on the development of a PhD level educational system. The demand on establishing a Doctoral School in the field of Geoinformation Science is in line with the aims of the Ministry of Higher and Secondary Specialized Education of Uzbekistan (MHSSE). The project specified a PhD programme and methods to deliver its courses.

As a major achievement of the project is that the establishment of the Doctoral School has been registered in 2019 by the Supreme Attestation Commission under the Cabinet of Ministers (SAC) as a state-recognized PhD programme.

The PhD programme consists of 18 courses divided into 6 compulsory courses and 12 advanced courses in 3 specializations. Among the 18 courses, 8 are prepared in English and 10 in Uzbek language. The rationale behind the share of

languages is a consequence of the project partners are expected to contribute equally to the course development, each HEIs developing 2 courses. The structure of the programme and the content of the courses are as follows.

## I. Compulsory courses prepared in English

- 1) Spatial representations and Spatial Data Infrastructures (SDI). The course provides a comprehensive overview on the state-of-the art of SDI, the underlying principles, as well as technological and non-technological components of SDIs.
- 2) Spatial statistics. The course aims at advancing knowledge on spatial data analysis and spatial statistics. It focuses on methods that are relevant in fields related to sustainable resource use and development of rural areas, such as land use change, climate change, soil degradation, and spatial analysis of well-being.
- 3) Global Navigation Satellite Systems (GNSS). This course provides the students with an in-depth knowledge about global navigation satellite systems, in particular positioning methods and algorithms as used in the fields of geoinformation science. The course focuses on high accuracy positioning methods, long term static observation methods for deformation monitoring and reference networks, and on atmospheric effects on GNSS signals.
- 4) Visually interfacing with spatial information. This course aims at introducing the complex field of visually interfacing with spatial information. Techniques and tools as well as concepts and standards to find, filter and visualize spatial data are presented. Technical skills and human-computer interaction competencies are built up.
- 5) Research methodology and scientific communication. This course introduces to students general research methods as well as practical research process, with focus on critical and creative thinking, addressing also scientific writing and communication in different forms and different media. Furthermore, social impact of scientific research, commercialization of research results through innovation is concerned.
- 6) Advanced remote sensing and digital image processing: This course aims at advancing remote sensing and digital image processing knowledge, techniques and skills for getting information from imagery and ability to solve complex tasks based on remote sensing. Emphasis is placed on gaining a practical understanding of the principles behind each technique and a consideration of their appropriateness in different applications.

II. Courses for specializations (there are 3 specializations, each consists of 4 courses, mostly in Uzbek language; when it is in English, it is noted).

### II/1. Geodesy:

- 7) Geodetic Reference Systems. This course aims to deepen the theoretical knowledge and practical skills for the development and management of research projects.

8) Advanced theory of errors. This course consists of studying the theoretical foundations of multivariate statistical analysis in relation to the processing and analysis of geodetic measurements.

9) Satellite gravimetry (in English). The course aims at advancing on physical geodesy knowledge from observational aspects, focusing on obtaining positioning and physical information from satellite-borne observations.

10) 3D laser scanning and mapping by UAV. This course focuses on application of 3D laser scanners and unmanned aerial vehicles in analysing data and creating digital maps or update existing maps.

#### II/2. Geoinformatics:

11) Geo-databases and distributed architectures. This course is on developing techniques and skills for designing and building a geospatial database, as well as managing such distributed geodatabases, and working with multi-user spatial data base.

12) Advanced thematic mapping. The course supports candidates in cartography, thematic mapping, cartosemiotics, contemporary issues of spatial data representation, use of automation and tools in geovizualisation.

13) Advanced spatial analyses. This course aims to provide knowledge and skills necessary to investigate the spatial patterns, advanced analytical and practical skills to identify and apply the correct analytical tools for problem solving, and to appropriately interpret the analysis results.

14) Integration of remote sensing and GIS. The main aim of this course is exploring the synergies of integrated remote sensing systems and GIS.

#### II/3. GIS applications:

15) Spatial decision support in land management. The course is aimed to get an idea of the current regulatory and legal acts that regulate the subject of green law, and the application of this knowledge in practical activities, with emphasis on the current legislation of Uzbekistan.

16) Land use economics. This course is aimed at promoting the knowledge of doctoral students in the field of land use and its economics.

17) Spatial simulation of environment. This course is a critical introduction to spatial simulation of ecosystems, embedding of the PhD student in modern research practices, introducing a young scientist into up-to-date context and language of the simulation domain, including proper software background.

18) Sustainable resource management (in English). This course introduces key concepts related to natural resource management for food security and sustainable development. The course summarizes major trends in changes in resource management globally, across scales, and by geographic zone and country, considering also impacts of global climate change on water and land use, and their implications for sustainable resource management.

Usually, the learning material developers are working on their own training unit specification and step-by-step development. This process needs of course a cross-functional implementation. In the design of detailed content, the competency matrix has been used to support the harmonization of the processes within the development team. Identifying skills, competencies and expected knowledge was one of the most important issues in training needs assessment (WP2). The first two columns of competency matrix contain the skills and competences; the name of courses is listed in the header.

Filling the matrix required a group meeting of course developers. The first step was to build a draft competency matrix revising and completing expected skills and competencies. After the matrix drafted each development team asked to check their units against the skills and competences and mark the relevant table cell.

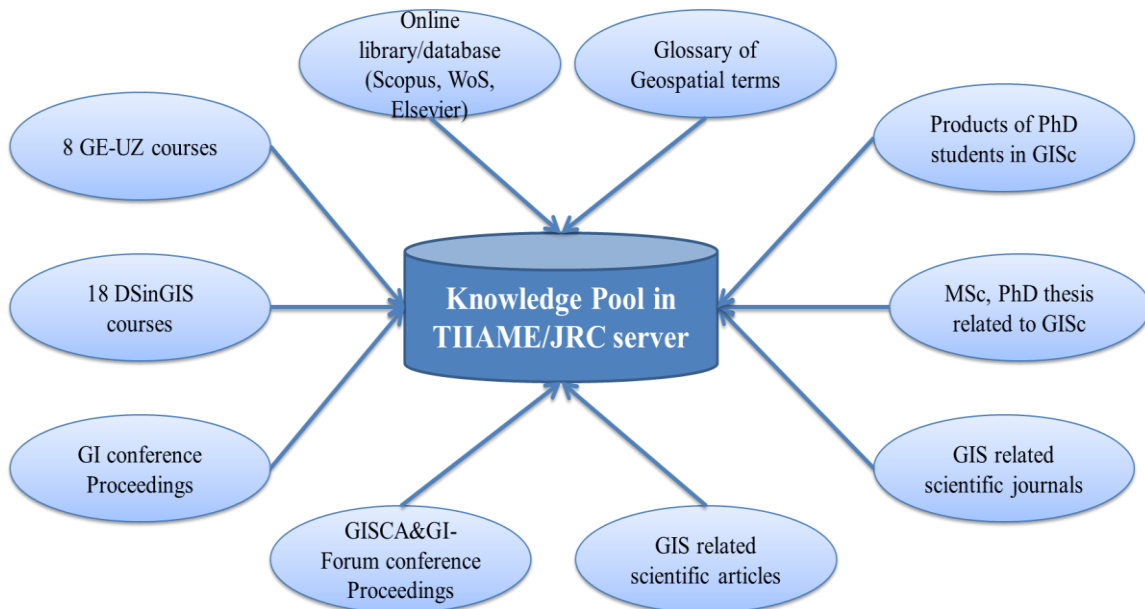
Creating the competency matrix has enabled the development team to see at a glance, what competences their trainees will possess. The matrix was functioning as a gap analysis tool, and as a discovery instrument of unnecessary overlaps. Any development team can reconstruct their own row in competency matrix to increase cross-functionality and include competencies it might be lacking.

The resulting matrix has contained a consensus between course developers. After creating it required refinement of unit specifications, which support the developers in writing harmonized learning materials. During the development phase the competency matrix needed periodical updating.

#### **4. Knowledge Pool**

Beyond the courses of the PhD programme, a Knowledge Pool is built providing a theoretical background for the PhD students in the field of GISc and related disciplines. The Knowledge Pool can openly be accessed at <http://tiame.uz/oz/page/GIKnowledgePool>.

The knowledge pool consists of a glossary of geospatial terms, proceedings of annual scientific conferences organized within the frame of this project, relevant digital libraries and scientific journals, 8 modules developed within the Tempus GE-UZ project ([http://www.dsingis.eu/wp-content/uploads/2020/01/GE-UZ-brochure\\_w\\_link.pdf](http://www.dsingis.eu/wp-content/uploads/2020/01/GE-UZ-brochure_w_link.pdf)), 18 modules developed within the Erasmus+ DSinGIS project, online library/database such as Scopus, EBSCO, Sciencedirect and Proquest, products of PhD students in GISc (e.g. DSinGIS Grantholders' technical reports, papers/articles, presentations and posters), MSc, PhD thesis related to GISc, GIS related scientific journals and articles, and also GISCA&GI-Forum conferences Proceedings (<https://gisca20.wordpress.com/>). The structure of the Knowledge Pool is presented on Fig. 2.



**Figure 2. Structure of the Knowledge Pool**

The glossary of geospatial terms is containing more than 1000 terms in Uzbek, helping interdisciplinary communications.

GISc conferences have been organized annually. Beyond the planned 3 conferences in the period of 2018-2020, additionally a conference in 2021 has been organized and held successfully. The submitted papers are published in a conference proceedings and selected papers in local journals.

According to the DSinGIS work plan in total for 15 selected doctoral candidates an opportunity to study in one of EU partner institutions (60 days/person) were provided. Due to the COVID-19 situation, 7 students could perform their studies in online form. The candidates have been carefully selected by the Admission and Examination Committee. The doctoral candidates were actively involved in project evaluation, dissemination, and exploitation (for more information see section 6). They have prepared travel reports focused on their research activities during their study visits in EU partner universities.

## **5. Knowledge Centres and Joint Research Centre**

Advanced IT network was installed at each Uzbek partner institution, which handles a Moodle Learning Management System. The centres are equipped by GIS and Remote Sensing specific devices. The centres have an IT platform for acquiring and sharing knowledge, videoconference system will be installed for frequent communication between doctoral schools, and it helps collaborative, blended learning. Each centre is equipped with a server, a video conferencing system set, and 3 workstations with advanced GIS & Remote Sensing software. An interactive projector set supports professional presentations of doctoral students.

A sustainable Joint Research Centre (JRC) is also established for the benefit of doctoral candidates in Geoinformatics, not exclusively DSinGIS partners, but covering the interdisciplinary applications in the country. The JRC was

established at TIIAME. The JRC is equipped with advanced hardware and Geospatial software. The technical / scientific staff is offered by TIIAME for free. JRC should result directly improved quality of doctoral researches and increased collaboration within partners and wider GI community. The expectations on the long run benefits of JRC are: (1) Uzbek institutions should be able to increase cooperation with EU research institutes, (2) industry in geospatial sector should be able to offer innovative business products, (3) society should benefit from innovations, e.g. smart city concept to enhance quality, performance and interactivity of services, to reduce costs and resource consumption and to improve contact between citizens and government.

## 6. Competence Development

There is a lack of experiences in the new educational methodologies and international tendencies in the Uzbek GI community. The aim of the project is to improve the knowledge, skills and competences of related Uzbek staff regarding management, administration, supervision and mentoring in doctoral studies. The competence development activity focuses on three target groups: 1) management/administration staff, 2) teaching staff and supervisors and 3) doctoral candidates.

There have been trainings and workshops organized in order to improve the competences of the different target groups of the Uzbek HEIs. Also, annual international GISc conferences were organized, which turned out to be a huge opportunity for the Uzbek Geoinformation society to participate and present up-to-date researches in the field of GISc and related sciences. The main parameters of such events are summarized in Table 2.

**Table 2. Events of Competence Development**

<b>event</b>	<b>target group</b>	<b>topics</b>	<b>date and location</b>
Training for management and administration	administrative staff, senior managers	management, administration, quality management, quality enhancement, internationalization issues	22-26 May 2018 Hungary
Workshop on learning support methodologies	Teaching staff, scientific advisors	learning support methodologies, eLearning tools and competencies in mentoring	15-18 October 2018 Uzbekistan
1st GI Conference	Teaching staff, research community, PhD students	presenting and discussing research findings, interests of young and senior,	19-20 October 2018

	and PhD candidates	Uzbek and international GI scientists	Uzbekistan
Workshop on interdisciplinary doctoral courses	Teaching staff, scientific advisors	experiences on interdisciplinary GISc issues of doctoral courses	June-July 2019 Austria
Training on supervision and research methodologies	Teaching staff, scientific advisors	supervision and research methodologies in GISc	15-18 October 2019 Uzbekistan
2nd GI Conference	Teaching staff, research community, PhD students and PhD candidates	presenting and discussing research findings, interests of young and senior, Uzbek and international GI scientists	22-23 October 2019 Uzbekistan
GISCA Conference	Teaching staff, research community, PhD students and PhD candidates	presenting and discussing research findings, interests of young and senior, Uzbek and international GI scientists	1-3 June 2020 online
3rd GI Conference	Teaching staff, research community, PhD students and PhD candidates	presenting and discussing research findings, interests of young and senior, Uzbek and international GI scientists	27-29 January, 2021 online
Geoinformatics Winter School	PhD students	practical and methodological skills for advanced use of spatial analysis methodologies and techniques of GISc	15-26 February, 2021 online

A major success of the competence development activities is the annually organized scientific conferences. On one hand, the number of the published papers is beyond expectation. But what is more important is that annually an increase of the level of the submitted papers can be observed. Also, the number of research performed in international cooperation could be observed. Originally, 3



GI conferences were planned. In 2018 and 2019 it was implemented according to the plans. In 2020, the GI2020 conference was agreed to be organized jointly with the GISCA2020 international conference, several publications from the DSinGIS community have been submitted. The GISCA2020 conference was finally held in 1–3 June 2020 in an online form. The online participation provided a kind of challenge for the young Uzbek GI community, and their participation turn to be below the expectations. In order to provide an appropriate forum for the young Uzbek colleagues, a face-to-face conference has been planned to be held as soon as the international pandemic situation enables organization of such conferences. Unfortunately, the pandemic situation has been prolonged by the end of the project period, so the 3rd GI conference was also arranged in online platform in 27-29 January 2021.

Also, a relevant contribution to competence development is that the project provides scholarship for the young PhD student generation for a 2-month visiting research at an EU partner university to get international experiences. The list of the awarded researchers and their parameters of visit is listed in Table 3. The candidates are selected carefully by an Admission and Examination Committee. In addition to UZ supervisors EU teachers are assigned to mentoring learning, supporting research activity. As it can be seen in Table 3, 7 candidates among the 15 could have not fulfil their travel due to the COVID-19 pandemic, but has received online supervision, which has been a challenge both for Uzbek PhD students and EU supervisors.

**Table 3. Scholarship Awardees**

<b>name</b>	<b>HEI</b>	<b>host</b>	<b>date</b>
Yakhshimurad Khudaybergenov	KSU	IAMO	October - November 2018
Mamanbek Reimov	TIIAME	OU	January – March 2019
Zokhid Mamatkulov	TIIAME	OU	January – March 2019
Otabek Avezbaev	TIAC	PLUS	March – May 2019
Kuwatbay Bekanov	KSU	IAMO	April – May 2019
Sitora Sodikova	SamSAC EI	PLUS	May – June 2019
Ilhom Abdurahmanov	TIIAME	OU	February – March 2020
Medetbay Uteuliev	KSU	OU	February – March 2020
Barno Khalilova	TIIAME	PLUS	February – March 2021 (online)
Azizjon Ruziev	NUU	OU	February – April 2021 (online)
Abdujalil Muminov	NUU	IAMO	February – April 2021

			(online)
Malika Aminjanova	SamSAC EI	OU	February – April 2021 (online)
Khudoyberdi Abdivaitov	TIIAME	PLUS	February – April 2021 (online)
Akbarjon Khamraliev	TIIAME	OU	February – April 2021 (online)
Ilkhomjon Abdullaev	NUU	OU	February – April 2021 (online)

## 7. Summary

With the coordination of the OU, an Erasmus+ Capacity Building in Higher Education, Key Action 2 project named Doctoral Studies in GeoInformation Sciences is conducted. The wider aim of the project is to support Uzbekistan in sustainable development by GISc. The objectives envisaged with the project is to establish a missing puzzle from the Uzbek educational system after the MSc level has been completed and before the DSc is targeted. The project established an accredited Doctoral School in the field of GISc, developed its programme, defined the requirements, advanced supporting teaching and learning materials in English or Uzbek languages, all developed in accordance to international standards and in accordance to the Uzbek education system.

As a support for the new Doctoral programme, a network of activities is conducted to improve the educational and research capacity of the Uzbek society. Among these activities, an international network of the 5 leading Uzbek universities is established. Also, their education capacity is developed by creating a Knowledge Centre at each Uzbek universities containing an e-learning platform with a jointly developed knowledge pool. The knowledge pool is also developed supporting research activity of future PhD students. Furthermore, a Joint Research Centre, a research lab has been developed to improve the research capacity of PhD programmes. Finally, annual GI conferences are organized to provide a platform for presenting research results.

As a consequence of the COVID-19 pandemic, certain activities could have not been completed according to the schedule, which resulted in the extension of the project period by 6 months. These activities were the development of a Joint Research Centre, the organization of a planned Summer School (which could arrange later as Winter School), and the visiting research in the EU of 7 Uzbek PhD students. Making use of the extension, all activities were completed.

## 8. Acknowledgements and Legal Notice

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### **Condolences**

The paper is dedicated to the memory of Prof. Uktam Umurzakov (figure 3). He as professor and rector of TIAME has been a key person of the project implementation both from scientific and managerial aspects. His contribution to the DSinGIS project is of superior relevance. Beyond the project, his contribution to the development of professional community in Uzbekistan is essential, his humanity, directness, excellent organizational and strategic skills are irreplaceable, and he will be missed forever.



**Figure 3. Prof. Uktam Umurzakov (1952-2021)**

### **References**

1. Abdurahmanov, I., Isakov, E.: Development of Knowledge Pool in Geoinformatics within the DSinGIS project. In: NEO Editorial Team (eds.) Erasmus+ in Uzbekistan, Tashkent, Üzbegisztán: National Erasmus+ Office in Uzbekistan, pp. 67-76.

2. Akbarov, O., Markus, B. & Podor, A. (2014) Development of advanced education in geoinformatics for enabling sustainable development in Uzbekistan. FIG Congress 2014.
3. Balázsik, V., Földváry, L. Kovács, A., Márkus, B., Pődör, A., Tóth, E., Verőné Wojtaszek, M., Busics, Gy., Nagy, G. (2020): Status of the DSinGIS Project. In: Orosz, Gábor Tamás; Petőné Csuka, Ildikó (szerk.) 15th International Symposium on Applied Informatics and Related Areas organized in the frame of Hungarian Science Festival 2020: AIS 2020, Székesfehérvár, Hungary, Óbuda University, pp. 24-28.
4. Erasmus+ CBHE Project “Environmental Protection In Central Asia (EPCA): Disaster Risk Management With Spatial Methods”, <http://eu-epca.eu/>
5. Erasmus+ CBHE Project “UZDOC: Furthering the Quality of Doctoral Education at Higher Education Institutions in Uzbekistan”, <http://www.uzdoc.eu/>
6. EU funded Project “Sustainable development in rural areas of Uzbekistan”, <http://www.uzruraldev.eu/en>
7. Földváry L., Balázsik V., Márkus B., Pődör A., Verőné Wojtaszek M., Abdurahmanov I. and Reimov M. (2020a): Doctoral School in Geospatial Science in Uzbekistan, Proceedings of the 6th International Conference on Research, Technology and Education of Space (H-SPACE 2020), Budapest, Hungary, p. 59-60.
8. Földváry, L., Balázsik, V., Márkus, B., Pődör, A., Verőné Wojtaszek, M., Abdurahmanov, I., Reimov, M., Avezbaev, O. (2020b): Project Management, Quality Enhancement and Dissemination in the DSinGIS project. In: NEO Editorial Team (eds.) Erasmus+ in Uzbekistan, Tashkent, Üzbegisztán: National Erasmus+ Office in Uzbekistan, pp. 46-55.
9. GeoInformatics Knowledge Pool, <http://tiame.uz/oz/page/GIKnowledgePool>
10. GIS in Central Asia Conference – GISCA 2020 on topic “Applied Geoinformatics for Sustainable Development”, <https://gisca20.wordpress.com/>
11. Glenaffric Ltd (2007) Six Steps to Effective Evaluation, A handbook for programme and project managers.
12. Gong, J., Yue, P., Woldai, T., Tsai, F., Vyas, A., Wu, H., Gruen, A., Wang, L. & Musikhin, I., 2017, Geoinformatics education and outreach: looking forward. Geo-spatial Information Science, 20/ 2, 209–217.
13. Hennig, S., Abdurahmanov, I.: Curriculum and e-Learning courses for GI doctoral studies in Uzbekistan: Development and Implementation on the Example of the DSinGIS project. In: NEO Editorial Team (eds.) Erasmus+ in Uzbekistan, Tashkent, Üzbegisztán: National Erasmus+ Office in Uzbekistan, pp. 56-67.
14. Hofmann, M., Müller, D., Hennig, S., Pődör, A., Verőné Wojtaszek, M., Abdurahmanov, I., Reimov, M.: Exchange scholarships to European research institutions in the frame of the DSinGIS project. In: NEO Editorial Team (eds.) Erasmus+ in Uzbekistan, Tashkent, Üzbegisztán: National Erasmus+ Office in Uzbekistan, pp. 84-93.

15. Márkus B. et al.: DSinGIS project Handbook, Szekesfehervar, 2017, p. 86.
16. Márkus, B., Földváry L., Abdurahmanov I. and Reimov M. (2020): Establishment of PhD Programme in Geoinformatics in Uzbekistan, Land of Uzbekistan, Scientific-Practical and Innovative Journal 7 (3): 2-4.
17. Mobaheri, A., Vahidi, H. & Guan, Q., 2014, Towards a web-based GIS for teaching geo-informatics at under-graduate level in developing countries: A case study of Iran.
18. Pintér, T., Abdullaev, I.U.: Glossary of Geospatial terms in uzbek. In: NEO Editorial Team (eds.) Erasmus+ in Uzbekistan, Tashkent, Üzbegisztán: National Erasmus+ Office in Uzbekistan, pp. 98-110.
19. Prüller, R., Scholz, J., Strauß, C. & Achleitner, T., 2009, Teaching GIS in Central Asia. Vermessung & Geoinformation, 2009/ 1, 174–178.
20. Tempus CBHE Project “GE-UZ: Geoinformatics: enabling sustainable development in Uzbekistan”, [http://www.dsingis.eu/wp-content/uploads/2020/01/GE-UZ-brochure\\_w\\_link.pdf](http://www.dsingis.eu/wp-content/uploads/2020/01/GE-UZ-brochure_w_link.pdf) +

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**ASSOCIATE PARTNERS AND BENEFICIARY  
ORGANIZATION ARE MAIN TARGET AIMS OF THE EPCA  
PROJECT**

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**Аннотация.** Ушбу мақолада “Erasmus+ EPCA” лойиҳаси натижаларининг амалиётган татбиқ қилинганлигига оид ишларнинг айримлари иллюстратив шаклда келтирилган. Мақола асосан манфаатдор ташкилотлар билан олиб борилган ишлар, учрашувлар ҳамда уларнинг қисқача мазмунини ўз ичига олади.

**Аннотация.** В данной статье в иллюстративной форме представлены некоторые работы по практической реализации результатов проекта Erasmus+ EPCA. В статье в основном рассказывается о проделанной работе, встречах с заинтересованными организациями, а также их резюме.

**Abstract.** This article presents some of the work on the practical implementation of the results of the Erasmus+ EPCA project in an illustrative form. It mainly covers the works carried out, organized meetings with interested organizations, as well as their summary.

## Introduction

Practically, it is always difficult to explain the expected results and outputs of the projects, especially when the beneficiary organizations have no idea about them. However, GIS and remote sensing have widely been applied for disaster risk reduction and environmental protection issues in the EU, and some other developed countries. Therefore, face to face meetings were essential with stakeholders. The project has had many meetings with different social groups to widen the results. Some information about the main meeting was given below.

**Meeting with stakeholders and beneficiary organization in Urgench, Uzbekistan.** Lund University professor, the coordinator of EPCA project Ali Mansourian visited UrSU, Uzbekistan on 18-19.09.2018 years. He explained the general aim and objectives, discussed activities and future plans of the project in the meeting. Accreditation of the courses and distance learning regulations of the country were discussed in detail with the vice-rector who is Dr. Sardor Xo'janiyazov, and with the head of the international relations office. The same day EPCA coordination and management meeting with NEO of Uzbekistan, and another meeting with stakeholders were organized. Dr. Q. Baxadirov from Erasmus National Office of Uzbekistan, Members from Khorezm and Muynaq branch Bureau of Ecology and Environmental Protection of Uzbekistan, Members from Khorezm regional branch of Emergency Situations of Uzbekistan and members from Hydro-meteorology organization of Karakalpak autonomous republic, and EPCA members from Karakalpak State University participated in the meeting (figure-1).

The Aim and objectives of the EPCA project, course development procedure, iMSEP, and its advantages, dissemination activities were presented by the coordinator. Expectations of stakeholders, their comments were discussed in detail. Regional associate partners showed their interest in the output of the project. They participated in discussions, questions were given, individual conversations were carried out. After the meeting, the team visited the environment of Khorezm oasis for fact-finding: Amudarya river, its eroding phenomenon, and tugai (river bank) forests and anthropogenic impacts to them, agricultural lands, saline areas were the main targets of the excursion. Current governmental regulations to protect the natural areas were explained by Mr. Atanazar Atajanov who is a member of the Khorezm branch Bureau of Ecology and Environmental Protection of Uzbekistan. 19th of September Prof. Ali Mansourian sat a meeting with students of Geodesy, cartography, geography department. He gave brief information about Lund University, Application, and future prospects of GIS and remote sensing. Luma GIS/iGEON, Ph.D., and master programs at Lund University were explained widely. Introductory lectures about Web GIS, Geographic Database, Geospatial Web Services were conducted.

Students asked the questions, and some individual conversations with Ph.D. students were carried out. After the meeting, the team visited the environment and historical places of Khorezm oasis: Sandy areas, agricultural and anthropogenic landscapes. Participants visited ancient Khiva city. Prof. Ali Mansourian concluded his visit and gave his suggestions, research, and pedagogic ideas for future collaboration were drawn.



Figure-1. Photos of the meeting with stakeholders and beneficiary organization in Khorezm

**Meeting with stakeholders and beneficiary organization in Bishkek, Kyrgyzstan.** Dr. Ali Mansourian visited Bishkek, Kyrgyzstan June 30 - July 4, 2018. Kyrgyz State University (I.A KSU), Ministry of Emergency Situations, National Erasmus Coordination Office, and World Health Organization (WHO) as well as experts from the Ministry of Health actively participated in the meeting. The aims and advantages of the project as well as applications of Special Information Science and Technologies for Environmental Protection and Disaster Risk Management were presented and discussed. After the meeting, a field trip was organized. Environmental situations, disastrous areas were the target of the trip. Some experiences, problems related to disaster risk reduction were discussed with the experts (figure-2).





Figure-2. Photos of the meeting with stakeholders and beneficiary organization in Bishkek

## Conclusions

The meetings changed the mind of the course developers, and the effects were seen in different cooperation activities. Since there were organized different meetings with regional beneficiary organizations at different times of the project lifetime. One of the latest ones took place with the Khorezm branch specialists of the Ministry of Emergency Situations and discussed the application of iMSEP for flood modeling on 18.06.2021 at Urganch State University. As a result of the meeting scientific cooperation on the issue of the flood, organizing training about the application of iMSEP for emergency situations was agreed.

## Acknowledgments

The Central Asian partners of the EPCA project thanks to Erasmus+ Programme of the European Union, Lund University of Sweden for supporting the project and for organizing trainings. Special thanks to the NEO of Uzbekistan for the given supports as well as publishing the materials.

## References

1. Ali Mansourian, Muzaffar Matchanov. EPCA: Environmental Protection in Central Asia: Disaster Risk Management with Spatial Methods. An illustrative and informative book of the project. In progress.
2. <http://eu-epca.eu/>



## **МАЛАКАЛИ КАДРЛАР ВА ЁШ МУТАХАССИСЛАРНИ ШАКЛЛАНТИРИШДА ЕВРОПА ИТТИФОҚИ ЭРАСМУС+ ТАЪЛИМ ДАСТУРИНИНГ РОЛИ “INTRAS” ЛОЙИХАСИ МИСОЛИДА**

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Транспорт соҳасида транспорт тизимларини интеллектуаллаш дунёда истиқболли йўналишлардан ҳисобланади. Интеллектуал транспорт тизимларини қўллаш орқали транспорт инфраструктурасини, соҳага замонавий ахборот-коммуникацион технологияларни қўллаш, транспорт тизимини ташкил этиш ва самарали бошқариш учун янги талабларга мос, маҳаллий ва минтақавий транспорт муаммоларини ечишга қодир янги авлод муҳандислари ҳамда мутахассисларини талаб этади.

Транспорт соҳасига малакали мутахассисларни тайёрлаш мақсадида 2020 йил июль ойида Тошкент давлат транспорт университети (ТДТрУ) таркибида “Транспорт интеллектуал тизимлари муҳандислиги” кафедраси очилди. Ушбу кафедранинг ташкил этиш ташаббуси 2017 йилда бошланган эди. Европа Иттифоқи Эрасмус+ дастурининг 2017-2020 йилларга мўлжалланган Эрасмус+ “Интеллектуал транспорт тизимлари: Ўзбекистон учун АКТ га асосланган янги магистратура мутахассислигини ташкил этиш” лойиҳаси доирасида лойиҳа иштирокчилари проф. Мухитдинов А.А., доц. Хакимов Ш.К., доц. Абдураззоқов У.А. ва катта ўқитувчи Қутлимуратов Қ.Р. лар ташаббуси иштирокида 2019-2020 ўқув йилидан “Интеллектуал транспорт тизимлари” янги магистратура мутахассислиги ва 2020-2021 ўқув йилидан эса, Тошкент давлат транспорт университети таркибида “Интеллектуал муҳандислик тизимлари” бакалавр йўналиши очилди.

Европа Иттифоқи Эрасмус+ дастури лойиҳалари доирасида бажарилган ва давом этаётган таълим лойиҳалари ўқув жараёнларини ривожлантириш, ёш кадрлар тайёрлаш сифатини оширишда катта аҳамиятга эга.

Европа Иттифоқи Эрасмус+ дастурининг INTRAS лойиҳаси Ўзбекистон учун янги интеллектуал транспорт тизимлари магистратура дастурини ишлаб чиқишга бағишланган. Лойиҳа доирасида юқори малакали илмий кадрлар тайёрлаш, уларнинг малакасини ошириш, янги замонавий ўқув лабораториялар яратиш, соҳалар билан алоқаларни мустаҳкамлаш ва бугунги кунда соҳадаги долзарб муаммоли масалаларни еча оладиган ёш муҳандисларни шакллантириш кўзда тутилган.

Тошкент давлат транспорт университетида лойиҳани амалга ошириш жараёнида Европа Иттифоқининг Польша - Гданск технология университети (лойиҳа координатори), Австрия - Клагенфурт Алпен-Адриа университети ва Словакия - Жилина университети, олийгоҳлар билан ўқув услубий ва илмий ҳамкорлик алоқалар ўрнатилди.

Шунингдек лойиҳа якунига қадар, Европадаги ҳамкор университетлар тажрибасини ўрганиш ва улар билан ҳамкорликда ишлаш муҳим ўрин тутди. Шу жумладан лойиҳа доирасида 6 та профессор-ўқитувчилар ва 5 магистрантлар ҳамкор университетларда малакасини оширдилар.



1–расм. а) Ўзбекистон профессор–ўқитувчилари ва магистрантларнинг Гданьск технология университетига ташрифи, б) Клагенфурт Алпен-Адриа университетида қисқа интенсив ўқув курсларга ташрифи ва в) Жилина университетида қисқа интенсив ўқув курсларга ташрифи



2–расм. а) Тошкент давлат транспорт университетида лойиҳа ишлари бўйича давра суҳбати ва б) ўқув семинар курсларни ташкил этиш бўйича давра суҳбати



а) б)

3–расм. а) Лойиҳа доирасида Тошкент давлат транспорт университетида Транспорт оқимини моделлаштириш фани ўқув курси ва б) Ўқув фанлардан ёзқи онлайн курслар ва вебинарлар

Лойиҳа доирасидаги магистратура курсларини 15 та магистрантлар муваффақиятли тугатди. Ҳозирги кунда ўқишни тугатган магистрлардан олийгоҳларда докторантура ҳамда илмий изланишларни давом эттириш ва ишлаш, худудлардаги транспорт бошқармаларда иш фаолиятларини бошлашди.

Хулоса ўрнида, Европа Иттифоқининг Эрасмус+ дастури лойиҳалари асосида кўпгина университетларда шаклланган хусусан ТДТрУ мисолида қуйидагиларни айтиш мумкин.

1. ТДТрУда бир қатор Европа Иттифоқи университетлари билан ўқув-услугий ва илмий тадқиқотларни ривожлантириш бўйича кенг алоқалар ўрнатилди.
2. Янги муҳандислик йўналишлари ва мутахассисларни ўқитиш бўйича дастурлар ишлаб чиқилди ва янги курслар яратиш жараёни давом этмоқда.
3. Ўқув-услугий ишлар, ёш кадрларни тайёрлаш учун моддий-техника ресурслари яхшиланди ва ўқув лабораториялар замонавий қурилмалар билан бойитилди.
4. Ўзбекистонда биринчи бўлиб “Интеллектуал транспорт тизимлари” бўйича мутахассислар тайёрланди.

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## AN ILLUSTRATIVE VIEW OF THE PARTICIPATION TO THE CONFERENCES, EXHIBITIONS, WORKSHOPS AND SOME OTHER ACTIVITIES OF THE EPCA PROJECT MEMBERS

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**Аннотация.** Ушбу мақолада “Erasmus+ EPCA” лойиҳаси, унинг мақсад ва вазифалари билан таништириш, олинган натижаларни ҳамкар ташкилотлар ҳамда кенг оммага етказиш мақсадида ташкил қилинган

учрашув, конференция ва кўргазмалар хақида қисқача маълумотлар келтирилган.

**Аннотация.** В этой статье представлена краткая информация о проекте Erasmus+ EPCA, его целях и задачах, встречах, конференциях и выставках, организованных для представления результатами с заинтересованными организациями широкой общественности.

**Abstract.** This article provides brief information about organized meetings, workshops and exhibitions for the purpose of sharing the Erasmus+ EPCA project goals and objectives, results to the beneficiaries and public.

## Introduction

Culturing and disseminating were the final objective of the EPCA project. Therefore workshops, conferences, exhibitions, training of trainers were planned. The use of SIST in environmental protection and disaster risk management, university-enterprise cooperation, EU education system, e-Learning and the use of ICT in education, and international relationships were the main topics/objectives of the activities. Motivating stakeholders to employ graduated students in Special Information Science and Technologies was also considered in workshops. Here below are some of the main activities described.

**Regional exhibition and conferences.** Beginning of the project the aim and objectives were presented at Erasmus+ Informational Seminar for UrSU and KSU on 04.04.2017 years. NEO Uzbekistan as an organizer of the meeting invited professors, researchers of both universities, and as well as students. Questions, interesting facts related to the preparation, financing issues were answered. The structure of the project expected results, and future use of the outputs were also explained (figure-1).



Figure-1. Photos of Erasmus+ Informational seminar at Urgench State University



Dissemination is essential for the CA partners in order to attract specialists from disaster risk reduction and environmental protection organizations. Therefore, the Kyrgyzstan team of the EPCA project presented the project at the International scientific and practical conference «Problems of improving the management of natural and socio-economic processes at the present stage» which was dedicated to the World Environment Day on 3-5.06.2018 years at Bishkek (figure-2).



Figure-2. EPCA members from Kyrgyzstan actively participated in the conference

An exhibition is a place where specialists can find interesting innovations, build cooperation channels with higher educational institutions and evaluate outputs. Urgench State University has organized a regional exhibition to widespread innovations and results of the researches on 15.03.2018 years. Posters and wallpapers prepared in English and Uzbek languages. Detailed information of the project, expected results was explained to the students, teachers, and stakeholders (figure-3).



Figure-3. EPCA members were in the exhibition in Khorezm region

EUREF (Sub-commission of International Association of Geodesy) held its annual symposium in Tallinn – Estonia, in the period from May 22 to May 24, 2019. As usual, representatives of national mapping agencies, universities and

enterprises of the majority of European countries attended the event. The latest achievements in the area of geodetic reference systems were discussed on this forum and the necessary resolutions were accepted. The Symposium consisted of several sessions, which included topics from the area of: horizontal and vertical reference systems (ETRS89 & EVRS), the European permanent and leveling network (EPN & UELN) and their concentration, as well as topics in relation with the measurement techniques and possibility for using the European GNSS Galileo system. Prof. Eimuntas Parseliunas attended the symposium and presented the paper “Promoting of the Geospatial Methods: Introduction into International Educational Courses in Environmental Protection and Disaster Risk Management” (figure-4) about the ERASMUS+ project,, Environmental Protection in Central Asia: Disaster Risk Management using Spatial Methods (EPCA)”.



Figure-4. EPCA member Prof. Eimuntas Parseliunas from Vilnius Gediminas Technical University attended the symposium

The iMSEP and its advantages were explained in detail to the stakeholders, the young generation, and society in an exhibition of Startup Projects of young's in Khorezm region, Uzbekistan on 04 March of 2020. The Urgnech State University members of the EPCA project answered the questions, presented disaster risk management maps. Participants of the exhibition were interested in how the program was created, developers, cost, and to whom it has been focused (figure-5).



Figure-5. EPCA members presented iMSEP in the exhibition in Khorezm region

**Online conferences and meetings.** During the COVID-19 almost all face-to-face meetings stopped and the team members decided to manage and carry out project-related activities online mode. As a result, following conferences, workshops, meetings, and other activities take place from distance.

**Conference in Kyrgyzstan.** On 7 May 2020 two universities - Osh State University and I. Arabaev Kyrgyz State University organized and held the Central Asian regional online conference "Environmental Protection in Central Asia: Disaster Risk Management with spatial methods (EPCA)". The conference was attended by professors and students from Osh State University, I. Arabaev Kyrgyz State University, Urgench State University, and Karakalpak State University. Representatives of the academic community and stakeholders were informed about the process of education, research, and technical developments in the field of environmental protection and disaster risk management. In the final resolution, the conference participants decided to further promote joint educational and research work, as well as to expand the exchange of students and teachers between partner universities. Professor Abdurashit Nizamiev concluded the conference and showed his thanks to the Erasmus+ program of EU, and all participants.

**Erasmus+ Week in Uzbekistan.** The Erasmus+ projects and their achievements, dissemination activities, as well as the implementations, in the scope of Urgench State University, presented at the "Erasmus+ Week in Uzbekistan" program on 10.14.2020. Overall information about EPCA project and dissemination activities, the teaching of the course materials, and iMSEP applications were presented by Muzaffar Matchanov (<https://www.youtube.com/watch?v=F8g5hsw0jIE>).

**Erasmus+ online project fair.** The EPCA-Kyrgyzstan project team (I.AKSU & OshSU) participated in the Erasmus+ online project fair and presented a project poster and video clip on November 5, 2020 years in Bishkek. EPCA project poster & promo materials were presented at the meeting. As a result, a thank-you note was given to the EPCA team from the National Office Erasmus+ in Kyrgyzstan.

**Monitoring meeting in Kyrgyzstan.** The monitoring visit of the National Erasmus+ Office in Kyrgyzstan took place at I.AKSU on 11.11.2020. The meeting was attended by the EPCA project team together with associated partners, as well as the national coordinator. The EPCA project team presented a presentation on the work done, the development of partnerships with other project participants, and student involvement in training courses. The team also demonstrated the new project laboratories. Associate Partners added their comments about the project and expressed interest in future graduates of the courses for further cooperation. At the end of the meeting, the national coordinator noted the high professionalism of the team and assessed the work done.

**Erasmus+ institutional monitoring at Urgench State University.** There was an Erasmus+ institutional monitoring meeting at Urgench State University and TEMPUS/Erasmus Mundus, Erasmus+ projects, their results, sustainability were discussed. EPCA project activities also were monitored: aim, objectives, outputs, sustainability, impacts to the society and structural changes by the influence of the project results evaluated in detail on 25-26<sup>th</sup> of November 2020.

**Workshop and ToT at Uzbekistan.** The workshop and the ToT took place in Urgench State University and Karakalpak State University during 09-15 September 2019 (figure-6). The objectives of the workshop: Culturing and disseminating; the use of SIST in environmental protection and disaster risk management, university-enterprise cooperation, EU education system, e-Learning and the use of ICT in education and international relationships are the main topics/objectives of the workshops; motivating stakeholders to employ graduated students in SIST is also considered in workshops.

They were conducted jointly including the representatives from partner and participants universities who were involved in the course development. Promoting the use of SIST in environmental protection and disaster risk management, achieving university-enterprise cooperation, and international relationships were the main topics/objectives of the workshops. Motivating stakeholders to employ graduated students in SIST was also considered in workshops. Specialists from the Ministry of Emergency Situations, Ecology and Environmental Protection Organizations, Hydrometeorology State Service, Land Cadaster, and Land Registration Organizations participated in a workshop. The total numbers of participants were more than 200 in both universities. Following activities carried out during ToT and workshop:

- EPCA project including its aims and objectives, work packages and activities, outputs and outcomes until today, and future activities were presented by the coordinator of the project.
- Developed courses were presented by the course coordinators from Vilnius Gediminas Technical University, National Technical University of Athens, and the Minho University of Portugal.
- iMSEP was demonstrated by the Lund University team.



- iMSEP and Moodle were installed on a server in UrSU and KSU. Technical staff was trained on how to maintain the system.
- EU education system and e-Learning, and the use of ICT in education was presented by Professor Petter Pilesjö.
- The coordinators of the project and Professor Petter Pilesjö, Dr. Salauat Abdireymov were interviewed by a national TV channel about the project. The news was broadcasted nationally in Uzbekistan.
- The head of the “Geodesy, cartography, geography” department Dr. Sattorbergan Avezov presented a laboratory equipped with the project.
- The regional coordinator presented and discussed the social benefits of EPCA, its importance for the improvement of education in UrSU and KSU and nationally in Uzbekistan. Also, he gave an overview of plans and activities for using iMSEP at the university (for educational purposes) and by stakeholders (to support planning and decision-making). (For more information, please visit the project web-page <http://eu-epca.eu/>)





Figure-6. Some photos from Urgench workshop of the project

**Online workshop and ToT at Kyrgyzstan.** The next Erasmus+ EPCA workshop and ToT for Kyrgyzstan were held by Zoom platform on January 26-27 in the 2021 year (figure-7). All project members, associate partners, beneficiary organizations, World Bank specialists, teachers, researchers, and students from Osh State University, I. Arabaev Kyrgyz State University, the other Kyrgyz university students participated in the event. Ali Mansurian, a professor at Lund University, demonstrated the use of iMSEP program, Professor Peter Pilesio and Professor Michael Ranstrom actually lectured on the Bologna government system and its activities at Lund University. The professor from Vilnius Gediminas Technical University Eimuntas Perselunas, Eleni Tomai, a professor at the National Technical University of Athens, and George Gustavo, a professor at the University of Minho, presented how they teach developed courses. I. Arabaev Kyrgyz State University docent Damira Tilenova showed the project financed laboratories and their usage and Urgench State University associate professor Muzaffar Matchanov presented the application of iMSEP for flood modeling in a case of small canals. Senior teacher Gulshaan Ergasheva presented the use of the iMSEP for COVID-19 mapping, cartographic opportunities of the system. Later, the attendees were awarded certificates.



Figure-7. Participants from online workshop and ToT at Kyrgyzstan

## Conclusions

It was found that participating in workshops, conferences, and seminars with project outputs can help to better dissemination. However, after the event the continuing the cooperation with interested organizations and specialists is essential. It requires more energy and continuous working from both the EU and CA the EPCA members of the project.

## Acknowledgments

The Central Asian partners of the EPCA project thanks to Erasmus+ Programme of the European Union, Lund University of Sweden for supporting the project and for organizing trainings. Special thanks to the NEO of Uzbekistan for the given supports as well as publishing the materials.

## References

1. Ali Mansourian, Muzaffar Matchanov. EPCA: Environmental Protection in Central Asia: Disaster Risk Management with Spatial Methods. An illustrative and informative book of the project. In progress.
2. <http://eu-epca.eu/>

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## МОДЕРНИЗАЦИЯ МЕДИЦИНСКОГО ПОСТДИПЛОМНОГО ОБРАЗОВАНИЯ: АНАЛИЗ РЕАЛИЗАЦИИ ПРОЕКТА CHILDCA

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**Аннотация.** Актуальность выбранной темы для статьи обусловлена важностью и социальной значимостью системы управления уходом за детьми в Узбекистане, а также модернизацией профессионализации и интернационализации медицинского последипломного обучения и подготовки высококвалифицированных кадров. В представленной статье описываются цели и задачи образовательного проекта CHILDCA – «Совершенствование системы обучения по уходу за детьми как модель модернизации последипломного медицинского образования в Центральной Азии», а также представлен анализ проделанной многогранной работы, в рамках задач проекта.

**Ключевые слова:** CHILDCA, педиатрия, последипломное образование, уход за детьми



**Аннотация.** Танланган мақоланинг долзарблиги Ўзбекистонда болаларни парвариш қилишни бошқариш, ҳамда ижтимоий аҳамияти, шунингдек тиббиетдан кейинги таълимнинг профессионализациясини модернизацияси ва интерхалқаро миқосида юқори малакали кадрлар тайерлаш билан боғлиқдир. Берилган мақолада CHILDCА – «Болаларни парвариш қилиш бўйича таълим тизимини такомиллаштириш Марказий Осиёда олий ўқув юртидан кейинги тиббий таълимни модернизация қилишнинг намунаси сифатида» таълим лойихасининг мақсади ва вазифалари тасвирланган. Шунингдек, маскур дастур доирасада амалга оширилган кўп тармоқли ишлар таҳлили тақдим этилган.

**Калим сўзлар:** CHILDCА, педиатрия, олий ўқув юртидан кейинги таълим, болалар парвариши

**Annotation.** The relevance of the chosen topic for the article is due to the importance and social significance of the child care management system in Uzbekistan, as well as the modernization of the professionalization and internationalization of medical postgraduate education and training of highly qualified personnel. The article describes the goals and objectives of the CHILDCА educational project- "Improving the system of child care education as a model for the modernization of postgraduate medical education in Central Asia", and also presents an analysis of the multi-faceted work done within the framework of the project objectives.

**Keywords:** CHILDCА, pediatrics, postgraduate education, child care

В стране последовательно реализуется комплекс мер по модернизации национального медицинского образования, внедрению в данную сферу международных образовательных стандартов, проведению комплексных научных исследований по актуальным проблемам охраны здоровья населения, в частности совершенствованию комплексных мер по уходу за детьми (<https://lex.uz/ru/docs/4323167>).

В соответствии с задачами Стратегии действий по пяти приоритетным направлениям развития Республики Узбекистан в 2017 - 2021 годах и Концепции развития системы здравоохранения Республики Узбекистан на 2019 - 2025 годы, а также в целях дальнейшего совершенствования системы медицинского образования и науки, обеспечения ее интеграции в практическое здравоохранение и повышения уровня оказания медицинской помощи, одним из важнейших направлений дальнейшего развития системы переподготовки и повышения квалификации медицинских кадров, обеспечение мониторинга и персонального учета процесса обучения медицинских кадров на курсах переподготовки и повышения квалификации (<https://lex.uz/ru/docs/4323167>).

Также, в целях кардинального совершенствования системы высшего образования, коренного пересмотра содержания подготовки кадров в соответствии с приоритетными задачами социально-экономического

развития страны, обеспечения необходимых условий для подготовки специалистов с высшим образованием на уровне международных стандартов необходимо дальнейшее совершенствование образовательного процесса, учебных планов и программ высшего образования на основе широкого использования новейших педагогических технологий и методов обучения, качественное обновление и внедрение современных форм организации научно-образовательного процесса магистратуры (<https://lex.uz/docs/3171587> ).

В рамках реализации вышеизложенных программ, крайне актуальным явилось начало нового образовательного проекта Erasmus Plus CHILDCA: «Совершенствование системы обучения по уходу за детьми как модель модернизации последиplomного медицинского образования в Центральной Азии» 598399-EPP-1-2018-1-IT-EPPKA2-SVNE-JP, финансируется Европейским Союзом. Реализация данного проекта планируется в период с 2019 по 2022 гг. и подготовлен в рамках образовательной программы Европейского союза Erasmus + (KA2 Capacity Building in the field of higher education) укрепление потенциала ВУЗов. Ташкентский педиатрический медицинский институт является партнером этого проекта (<https://tashpmi.uz/mezhdunarodnoe-sotrudnichestvo/mezhdunarodnye-granty-i-stipendii/erasmus-proekt-childca/> ).

Проект ChildCA был разработан, чтобы помогать высшим учебным заведениям стран-партнеров разрабатывать, модернизировать и распространять новые учебные программы, методы обучения или материалы стремясь улучшить навыки, модернизировать институты и системы высшего образования, а также создать более тесные партнерские отношения между ЕС и системами образования во всем мире, преследуя следующие цели:

- 1) Поддерживать модернизацию, профессионализацию и интернационализацию последиplomного обучения в области педиатрии в странах ЦА в сотрудничестве с вузами ЕС, которые готовы поделиться своим опытом и знаниями в отношении конкретных целей проекта;
- 2) Оказывать поддержку странам ЦА в повышении качества, актуальности, планирования и проведения последиplomного обучения в сфере педиатрии в высших учебных заведениях (ВУЗах) ЦА с учетом возможного структурного улучшения организации указанного обучения;
- 3) Содействовать улучшению предложений последиplomного обучения (аспирантуры) в других областях медицины, в то же время продвигая углубленный анализ в этой области в европейских вузах;
- 4) Подчеркнуть значимость педиатрии в текущем процессе реформирования здравоохранения в странах ЦА, способствуя тем самым снижению младенческой смертности за счет изменения подхода к современным методам педиатрии и неонатологии;
- 5) Обеспечить прочную основу подготовки медицинских работников, занимающихся первичной медико-санитарной помощью;

6) Повышение квалификации международных офисов (МО) вузов ЦА посредством специального обучения и рабочего взаимодействия с МО вузов ЕС;

7) Повысить актуальность научных исследований стран ЦА в сценарии международной научной литературы путем более глубокого взаимодействия с университетами партнерами ЕС и более информированных отношений в сфере научного рецензирования;

8) Содействовать общению между людьми, межкультурной осведомленности и взаимопониманию в сети вузов разных стран (<https://www.childca.eu/the-project/>).

С начала реализации проекта была проведена масштабная подготовительно - методологическая работа, нацеленная на создание надежной основы для разработки новых учебных программ, на основе лучших практик ЕС. Данные программы будут предназначены для клинической ординатуры по педиатрии, детской хирургии и детской нейропсихиатрии при медицинских факультетах в трех странах Центральной Азии (Казахстан, Таджикистан, Узбекистан).

Пошагово реализуя цели проекта, для комплексной оценки был подготовлен и представлен широкий спектр данных, касающихся состояния здоровья детей в Узбекистане. Эти данные представляют собой компиляцию страниц, взятых из интеллектуального анализа данных на официальных вебсайтах ООН, ЮНФПА и Всемирной Организации Здравоохранения. Отчет включал в себя статистические показатели рождаемости, коэффициент младенческой и материнской смертности, среднегодовой темп прироста населения (%), среднесрочный прогноз и другие индикаторы заболеваемости в Узбекистане. Важным анализом явилось представление сравнительных показателей этих индикаторов у стран-партнеров (Рис 1.).

**Рис.1. Данные о здоровье населения Республики Узбекистан**

2.3 Данные о здоровье в Узбекистане

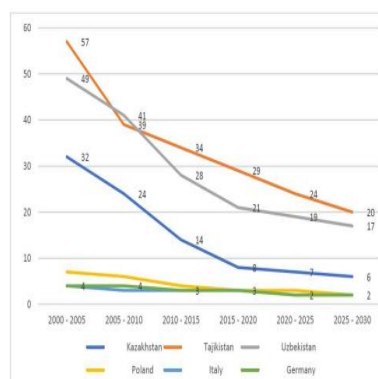
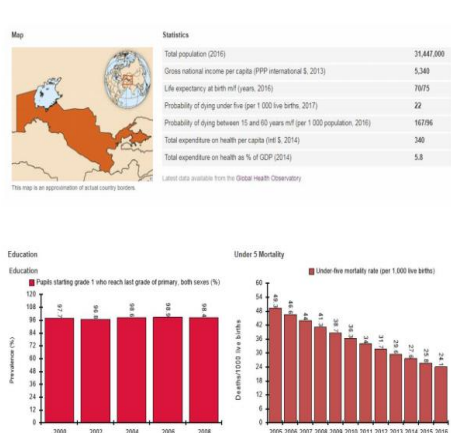


Рис. 1 - Коэффициент младенческой смертности в странах проекта, хронологическая тенденция 2000-2030 гг.

**(Диаграммы взяты из базового документа, декабрь 2019;  
<file:///D:/Users/SAIDA/Downloads/baseline%20-%20Russian.pdf> )**

Поскольку создание учебных программ представляет собой процесс переговоров и принятия решений, который в конечном итоге определит качество профессиональной подготовки участвующих слушателей, были созданы и распространены во всех педиатрических учреждениях Республики Узбекистан «специальные анкеты» для исследования потребностей пользователей, чтобы обеспечить сбор информации о видении и потребностях различных участников (органов образования и здравоохранения, академического персонала, профессионалов и профессиональных ассоциаций, аспирантов и студентов). Анкета (вопросник по подготовке обучения в области управления педиатрией в Центральной Азии) была разработана в соответствии с европейскими стандартами, состоящая из 4 разделов в соответствии с системой SWOT (Сильные и слабые стороны, Возможности, Угрозы). Общее количество респондентов составило 135 человек. Следует отметить, что распределение респондентов по статусу – отражает довольно равномерное участие студентов и аспирантов (соответственно, 20,1% и 23,5%), немного превосходящих по численности педиатров (24,8%) и на одном уровне с преподавателями университета (21,3% суммируют все три специальности). Приняв во внимание данный анализ, мы могли наблюдать, как величина выборки и разнообразие респондентов (должностные лица, преподаватели, студенты и т.д.) позволяет экстраполировать собранные ответы на всю ситуацию в стране (рис.2).

По результатам анализа были сделаны выводы: большинство респондентов желают, чтобы проект был успешным, многие указали, что он поможет снизить заболеваемость и детскую смертность; 38 респондентов предполагают, что в рамках проекта будут организованы мастер-классы по методическим тренингам европейских программ (для аспирантов) и по медицинской деятельности; 7 респондентов предлагают ввести новые учебные программы и обучающие курсы по медицинским технологиям и многое другое, другие 7 предлагают продолжать реализацию проекта, и другие 5 предлагают продолжить сотрудничество со многими странами мира в целях улучшения качества педиатрических услуг.

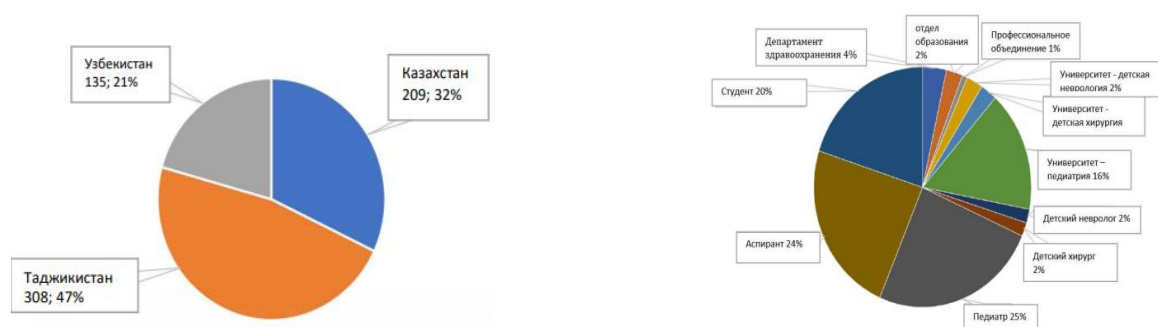
Более детальные комментарии представлены ниже:

- Приветствуются не только предложения по модернизации учебной программы для клинических ординаторов, но и программы подготовки специалистов на 2-м этапе высшего образования в магистратуре. Кроме того, необходимо улучшить существующие программы непрерывного образования для врачей и систему непрерывного профессионального образования в целом.

- Все врачи должны знать иностранные языки. Нужна онлайн консультация пациентов, онлайн обучение и развитие практических навыков.

- Внедрение новых образовательных технологий в учебный процесс; подготовка компетентных специалистов в области педиатрии.
- Желаем успешной реализации проекта, снижения детской заболеваемости и смертности, увеличения продолжительности жизни населения, совершенствования учебных программ и современных стратегий последиplomного образования в Республике Таджикистан.
- Создание и внедрение новых учебных модулей по педиатрии в аспирантуре, принятых в странах ЕС, направленных на достижение лучших результатов в улучшении (<file:///D:/Users/SAIDA/Downloads/baseline%20-%20Russian.pdf> ).

**Рис.2. Анализ результатов проведенного анкетирования по подготовке обучения в области управления педиатрией в Центральной Азии (Диаграммы взяты из базового документа, декабрь 2019 <file:///D:/Users/SAIDA/Downloads/baseline%20-%20Russian.pdf> )**



На основании подготовленного базового документа была предложена программа последиplomного обучения по педиатрии. Данная учебная программа основана на соединении следующих документов:

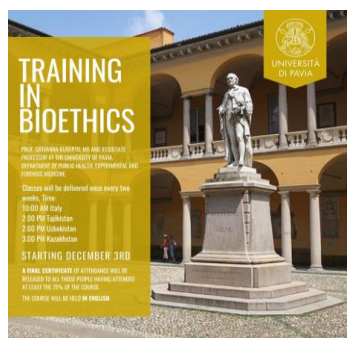
- 1) Союз Европейских Медицинских Специалистов – Раздел Педиатрии - Европейские Требования к обучению в Педиатрии;
- 2) Союз Европейских Медицинских Специалистов - Европейская Академия Педиатрии - Учебный план Общей базы обучения по Педиатрии;
- 3) Польская программа обучения по Педиатрии;
- 4) Немецкая до- и последиplomная программа обучения по Педиатрии;
- 5) Программа Итальянских Специализированных Школ по Педиатрии;
- 6) Базовый документ ChildCA (<https://www.childca.eu/wp-content/uploads/2021/05/Paediatric-Curriculum%D0%9F%D0%B5%D0%B4%D0%B8%D0%B0%D1%82%D1%80%D0%B8%D1%87%D0%B5%D1%81%D0%BA%D0%B0%D1%8F->



[%D0%BF%D1%80%D0%BE%D0%B3%D1%80%D0%B0%D0%BC%D0%BC%D0%B0-RU.pdf\).](#)

Для достижения поставленных задач проекта и внедрения новых знаний, инновационных методик и опыта были проведены серии 3-х крупных образовательных вебинаров: «Биоэтика», «Медицинское обучение и образование в цифровую эпоху. Перспективы и вызовы», «Генетика». Эта международная инициатива является результатом тесного сотрудничества между центром IDCD Университета Павии, Ягеллонским университетом в Польше, EDEN (Европейской сетью дистанционного и электронного обучения) и EduOpen (Рис. 3).

**Рис.3. Вебинары с участием сотрудников и студентов ТашПМИ и Вуз-партнеров (ссылка на ТГ-канал ТашПМИ: <https://t.me/joinchat/AAAAAEWXCZVvD3lZYAR2zg>, ссылка на персональную страницу ТашПМИ в ФБ: <https://m.facebook.com/tashpmi.press/> )**



Благодаря проделанной работе результатами станут новые учебные планы и новые стратегии обучения, посвященные комплексному уходу за ребенком, согласно принятыми в странах ЕС и нацеленными на достижение тех же результатов. Продуктом проекта будет являться достижения важности ухода за детьми в текущем процессе реформы здравоохранения в странах ЦА, что в последующем будет способствовать сокращению младенческой смертности за счет обновленного подхода к современным методам неонатальной и педиатрической помощи, широко используя инструменты новейших технологий. Чтобы обеспечить прочную и устойчивую основу для обоснования этих результатов, всем партнерам будут предоставлены самые современные системы обучения и телеконференции в области ИКТ, а также обучение без отрыва от производства.

Таким образом, резюмируя вышеизложенное, необходимо отметить важность и социальную значимость данного проекта в области управления уходом за детьми в Узбекистане, а также в системе модернизации, профессионализации и интернационализации последиplomного обучения и подготовки кадров.

## **Some results of the Erasmus+ CBHE UNICAC project realization at Tashkent University of Information Technologies**

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Uzbekistan is taking important steps to introduce international experience in reforming the educational process, improving its quality, gradual integration into the international educational community. Internationalization of education expands opportunities for individual choice in acquiring knowledge, enhances competition and leads to improved quality and efficiency of education in the country. International cooperation is one of the fastest growing areas in HE in Uzbekistan.

In the era of globalization, universities face two major challenges: first, to be able to respond to the demand for skilled, entrepreneurial and innovative human resources capable of developing careers in a global environment; second, to be present in international cooperation programmes, projects and networks for learning, research and innovation, for which it is crucial to attract talent from both researchers and students. Responding to both challenges can enhance the contribution of universities to a knowledge-based society. To achieve this goal, the best tool is internationalisation, which will enable the university to respond to the demands of a 21st century society that demands innovation, human development and the search for sustainable growth.

Internationalisation is essentially the dissemination and transfer of knowledge that is created at a university institution, allowing it to be discovered and enriched through encounter and contact with other cultures. Knowledge has no borders, the development of international cooperation facilitates the transfer of knowledge between universities. Therefore TUIT pays special attention to the establishment of international cooperation with famous universities in the world.

TUIT implements together with universities from Central Asia and China the ERASMUS+ project UNICAC: University Cooperation Framework for Knowledge Transfer in Central Asia and China. The main objective of the project is to improve the international offices of the partner universities. During the implementation of the project the professors have proposed many new and interesting ideas, which will be used in future for development of international cooperation of our university with European and Asian universities.



At present TUIT's main fields of activity - teaching, research and knowledge transfer - are increasingly situated in a global and open context, where diversity and pluralism need to be encouraged. Consequently, internationalisation is a strategic dimension that should be gradually integrated into the life of the university, forming an essential part of the research field and gradually encompassing all aspects of learning and knowledge transfer. From our point of view, internationalisation is a medium- to long-term strategy, supported by a cross-cutting process involving all areas of university management and operations, and which should take into account that the national and the international are by no means mutually exclusive.

Given the present and future relevance of this proposal, the university community should be involved in what the internationalisation of the university means and implies; and explain with sufficient clarity and specificity what their objectives are and the various lines of action that will enable us to achieve them. To this end, a regulation has been drafted that includes the roles and missions of an "International Scientific Advisory Board" to be set up to develop and implement TUIT's strategic plan for internationalisation.



Roles and mission of the "International Scientific Advisory Council". The members of the Council are from 12 to 15 persons, elected or appointed by the rector of the university for a period of five years. Council members will consist of UNICAC project participants, experienced staff and partners of the university. The main mission of the council is to provide informed recommendations on the main directions of the university's research and education policy based on foreign experience, such as the strategic development plan, design and accreditation of educational programmes as well as improvement of educational and research infrastructure, including teaching laboratories and research centres. The International Scientific Advisory Board also advises the HEI's management on matters related to international cooperation. The Council advises faculty deans and heads of departments on research and teaching, including the creation of new curricula.

Currently, the International Scientific Advisory Council will be chaired by a member of the UNICAC project who is appointed by order of the Rector. Once the Council is established, the chairperson will be elected by the members of the Council for a period of 5 years with the possibility of a one-time renewal.

The International Scientific Advisory Board shall meet at least twice a year via skype or physically at the university campus. The incumbent manager may also organise meetings on an as-needed basis. Appointed members:

- 2 representatives from the partner university country, one from academia and one from industry;
- members from the country participating in UNICAC, 8 academics, renowned scientists and professors from all over the world, from which a chairperson shall be appointed;
- 1 representative from the ministry of higher education of the partner country
- 1 acting chairperson

Elected members

- 1-3 representatives from HEIs representing scientific staff, engineers, technicians and administrative staff.

Thus, on the basis of the strategic development plan it will be possible to develop international cooperation of universities, through these measures Uzbekistan universities will be recognized by foreign partners, which contributes to the further growth of the prestige of universities of the country.

**ERASMUS+ ДАСТУРИ ДОИРАСИДА ТАШКИЛ ҚИЛИНАДИГАН  
СЕМИНАР-ТРЕНИНГЛАРНИНГ АҲАМИЯТИ ХУСУСИДА  
(NICOPA, SPACECOM лойиҳалари)**

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Мирзо Улуғбек номидаги Ўзбекистон миллий университети**

**Аннотация.** Мақолада ERASMUS+ дастури SPACECOM ва NICOPA лойиҳалари доирасида ТАТУ да ташкил этилган кичик сунъий йўлдош тизими муҳандислиги тренинги ёритилган. Тренинг натижаларини кенг талабалар орасига ёйиш мақсадида ЎЗМУда ташкил этилган семинар тафсилотлари, тренинглари республикамиз олий таълим тизимини ривожлантиришдаги аҳамияти баён қилинган.

**Аннотация.** В статье описывается тренинг по проектированию малых спутниковых систем, организованный в ТУИТ в рамках программы ERASMUS + : проектов SPACECOM и NISOPA. Подробно рассказывается о семинаре, организованном в Национальном университете Узбекистана с целью распространения результатов обучения среди широкого круга студентов, а также о значении тренингов в развитии системы высшего образования республики.

**Abstract.** The article describes the training on the design of small satellite systems, organized at TUIT in the framework of the ERASMUS+ programme: the SPACECOM and NICOPA projects. It tells in detail about the seminar organized at the National University of Uzbekistan with the aim of disseminating learning outcomes among a wide range of students, as well as the importance of trainings in the development of the higher education system in the republic.

Мухаммад Ал-Хоразмий номидаги Тошкент ахборот технологиялари университетида 2021 йил 29-31 март кунлари Erasmus+ дастурининг SPACECOM (Космик тизимлар ва алоқа техникалари бўйича янги ўқув дастурлари) ва NICOPA (Аниқ қишлоқ хўжалиги учун янги ва инновацион курслар) лойиҳалари доирасида «SMALL SATELLITE SYSTEM ENGINEERING TRAINING» (Кичик сунъий йўлдош тизими муҳандислиги тренинги) мавзусидаги уч кунлик семинар-тренинг ўтказилди. (<https://nuu.uz/uzc/press/news/events/ev-international/1670>)

Тадбирда Тошкент ахборот технологиялари университети, Ўзбекистон Миллий университети, Тошкент Давлат техника университети, Тошкентдаги Турин политехника университети, Тошкент ирригация ва қишлоқ хўжалигини механизациялаш муҳандислари институти, Фарғона политехника институти ходимлари қатнашишди. Шу жумладан Ўзбекистон



Миллий университетидан жами 12 киши иштирок этиб, уларнинг ярми магистрант ва бакалаврият талабалар ҳиссасига тўғри келади.

Семинар-тренингда маърузачи аэрокосмик инженер, олима, математик ва технолог Дарья Степанова (Daria Stepanova) бугунги кунда EXOLAUNCH GmbH (Берлин) компаниясида система инженери ва лойиҳа менежери лавозимида фаолият олиб бормоқда. Кичик сунъий йўлдошлар саноатидаги фаолияти давомида у технологиялар намоиши, об-ҳаво мониторинги, Ерни кузатишдан токи физик объектлар (“*нарсалар*”) орасида маълумотларни узатиш тармоғи (IoT – Internet of things) гача CubeSat нинг 10 та муваффақиятли миссияларида иштирок этган ва жамоани бошқарган. Унинг илмий қизиқишлари аэрокосмик лойиҳалар ва кичик сунъий йўлдош саноатида қўлланиладиган янги технологиялар билан боғлиқ тезкор лойиҳаларни бошқаришга қаратилган.



*Маъруза дарсидан лавҳлар. Дарья Степанова ва маъруза иштирокчилари.  
29.03.2021 й. ТАТУ*

Ўтказилган семинар-тренингдан кўзланган асосий мақсад унда иштирок этувчи лойиҳа аъзолари, тадқиқотчилар, магистратура ва бакалаврият талабаларига кичик сунъий йўлдошлар (Cubesatлар), уларни ишлаб чиқариш, Cubesatлар ҳақида дастлабки тушунчаларни бериш ва унга оид атамаларни ўргатиш ва кичик топшириқларни бажариш ҳамда уларни муҳокама қилишдан иборат.

Ташкил қилинган 3 кунлик семинар-тренинг маъруза ва амалий машғулотлар кўринишида ўтказилди. Ҳар бир кунги назарий маъруза ўша куннинг ўзида амалий машғулотлар билан тўлдириб борилди. Назарий қисмда мавзу юзасидан кириш маърузалари, тегишли видео материаллар берилиб, қатнашчилар билан савол-жавобларга (Q&A) вақт ажратилди. Амалий қисм эса амалий топшириқларга кириш, тадқиқот ишлари, аналитик асбоблардан фойдаланиш ва ҳисоб-китобларни бажаришдан иборат.

Семинар-тренинг давомида кичик сунъий йўлдош тизимларининг хусусиятлари ва фарқлари батафсил кўриб чиқилди, сунъий йўлдошларни лойиҳалаштириш, уларнинг тизимларини орбитага етказиб бериш масалалари ва муаммоларига тўхталиб ўтилди. Шунингдек, иштирокчилар бундай сунъий йўлдошларни яратиш тарихи ва ушбу йўналишни

ривожлантиришнинг мумкин бўлган усуллари билан танишдилар. Бундан ташқари, машғулотнинг амалий қисмида иштирокчилар томонидан муваққил равишда миссияни ишлаб чиқиши, мавзуга янада чуқурроқ киришиш имкониятини берди.



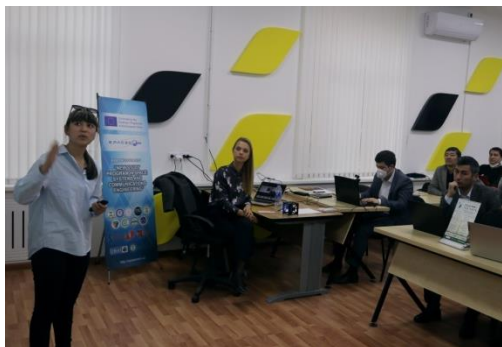
*Амалий машғулотлардан лавҳалар. ЎзМУ ва ТАТУ иштирокчилари. 30-31.03.2021 й. ТАТУ*

Тренинг биринчи кунда “Кичик сунъий йўлдош технологиясига кириш” (Introduction to small satellite technology) мавзусида аэрокосмик тадқиқотларга кириш; кичик сунъий йўлдош луғати, улар конструкциясининг спецификацияси, кичик сунъий йўлдошларнинг қуйи тизимлари, электр энергетика системаси ва борт компютери тўғрисида маълумотлар берилди. “Кичик сунъий йўлдош технологияси” (Small satellite Technology) мавзуси бўйича унинг қуйи тизимлари: алоқа, назорат ва ҳаракатланишга доир зарурий маълумотлар баён этилди. “Кичик сунъий йўлдошни лойиҳалаш” (Small Satellite Design) амалий машғулотида лойиҳа топшириғига кириш, кичик сунъий йўлдош миссиясини лойиҳалаш ва таҳлил қилиш ҳамда талабларни таҳлил қилиш ишлари бажарилди.

Иккинчи кунда “Кичик сунъий йўлдош миссияси тарихи” (Small satellite mission history) мавзусини ёритишда 1999 йилдан 2021 йилгача бўлган даврда кичик сунъий йўлдош миссиялари; уларнинг келажакдаги миссиялари; уларни ишлаб чиқиш саноатининг технологик тенденцияларига, “Кичик сунъий йўлдош саноати” (Small satellite industry: from solo missions to constellations) мавзуси бўйича улар саноати тўғрисида умумий маълумотлар; илмий ва технологик намоёниш миссияларига тўхталиб ўтилди. Амалий машғулотида “Кичик сунъий йўлдошни лойиҳалаш” (Small Satellite Design) учун сунъий йўлдошнинг архитектураси ишлаб чиқилди, унинг қуйи тизимлари аниқланди ва таҳлил этилди, шунингдек унга кетадиган молявий маблағ ҳам таҳлил қилинди.

Семинар-тренинг сўнгги учинчи кунда “Учириш установаси ва ажратиш системаси” (Launchers and separation systems) мавзусида кичик сунъий йўлдошлар қандай учирилиши керак деган саволга жавоб берилиб, ташувчи воситалар ҳақида умумий маълумотлар, ажратиш тизимларини таҳлили, ишга тушириш установасини танлаш учун текшириш рўйхатига доир маълумотлар берилди. “Кичик сунъий йўлдошни лойиҳалаш” (Small

Satellite Design) амалий машғулотида ишга тайёргарлик қилинди ва виртуал тарзда орбитага чиқариш ишлари амалга оширилди. Курс охирида иштирокчилари лойиҳаларини тақдим қилишди ва улар орасидан ғолиблар танлаб олинди.



ЎзМУ иштирокчиси Ж.Султоновнинг лойиҳа тақдими ва якуний қисмдан лавҳалар.  
31.03.2021 й. ТАТУ

Берлин техника университети ва EXOLAUNCH GmbH компанияси томонидан ташкил этилган семинар-тренинг дарсларида олинган билимларни кенг жамоатчиликка етказиш ҳамда талабаларни халқаро лойиҳаларда иштирокини оширишга қаратиш мақсадида Ўзбекистон Миллий университетида “NICOPA: аниқ қишлоқ хўжалиги учун янги ва инновацион курслар” ҳамда “SPACECOM: Космик тизимлар ва алоқа техникалари бўйича янги ўқув дастурлари” лойиҳалари доирасида 2021 йил 8-апрель куни "Кичик сунъий йўлдошлардан фойдаланиш" мавзусида семинар ташкил қилинди (<https://nuu.uz/uzc/press/news/events/ev-international/1671>).

Тадбирда География ва табиий ресурслар, Физика, Биология ва тупроқшунослик факультети профессор ўқитувчилари ва талабалари қатнашишди.

Семинарда лойиҳа иштирокчилари томонидан “Кичик сунъий йўлдош тизимлари”, “Ўзбекистон ҳаво йўллари авиакомпанияси самолётларини кузатиб бориш”, “Масофадан зондаш орқали Тошкент шаҳрида йўллардаги тирбандликни ва ердан фойдаланишдаги ўзгаришларни аниқлаш” мавзуларида маърузалар қилинди.

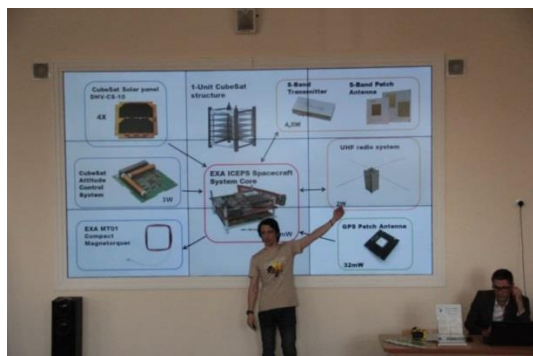


И.Ў. Абдуллаевнинг кириш сўзи билан семинарнинг очилиши ва семинар иштирокчилари. 08.04.2021 й. ЎзМУ



Семинарнинг амалий қисмида лойиҳа иштирокчилари томонидан тайёрланган виртуал сунъий йўлдошнинг фазога парвози махсус дастурлар ёрдамида барча параметрларни ҳисобга олиб, моделлаштирилган ҳолда амалга оширилди ҳамда унинг орбитаси, учиш баландлиги, даврийлиги синовдан ўтказилди.

Семинар якунида қатнашувчилар томонидан берилган саволлари бўйича эркин мулоқот бўлиб ўтди.



А.Небесний ва М.Абдукаримовларнинг маърузаларидан лавҳалар.

08.04.2021 й. ЎЗМУ

Ташкил қилинган бундай семинар-тренингларнинг Ўзбекистон Республикаси олий таълим тизимининг ривожланишига ижобий таъсир кўрсатади. Бунда айниқса бакалаврият талабаларининг, магистрантлар ва таянч докторантларнинг иштирок этганлиги, шунингдек, семинар-тренинг маълумотлари асосида тайёрланган маърузалар орқали унинг университетда ёйилиши келгусида кичик сунъий йўлдошларни муайян мақсадлар учун ишлаб чиқиш, аниқ қишлоқ хўжалиги масалаларини ҳал қилишда улардан фойланиш соҳасини ривожланишига ёрдам беради.

## IMPORTANCE ROBOTICS AND MECHATRONICS TO INDUSTRY REVOLUTION

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**Annotation:** Mechatronics and robotics quickly penetrated into all spheres of human activity, formed as a priority of scientific and technological development, entered the list of «important technologies» that determine the level of production, product competitiveness, quality of life. At the same time, mechatronic and robotic systems are widely used in the fields of machinery and equipment, automobiles, robotics and computer technology, as well as in industries such as railways, aerospace, medicine, office, military and home appliances. This article explores the basic concepts of robotics and mechatronics, its goals and objectives. The article also examines the role and impact of robotics and mechatronics in the industrial revolution.

*Key words:* mechatronics, robotics, industry 4.0, industrial revolution.

**Аннотация:** Мехатроника робототехника быстро проникла во все сферы деятельности человека, сформировалась как приоритет научно-технического развития, вошла в список «важных технологий», определяющих уровень производства, конкурентоспособность продукции, качество жизни. В то же время мехатронные и роботизированные системы широко используются в областях машин и оборудования, автомобилей, робототехники и компьютерных технологий, а также в таких отраслях, как железные дороги, аэрокосмическая промышленность, медицина, офис, военная и бытовая техника. В этой статье исследуются основные концепции робототехники и мехатроники, ее цели и задачи. В статье также исследуется роль и влияние робототехники и мехатроники в промышленной революции.

Ключевые слова: мехатроника, робототехника, индустрия 4.0, промышленная революция.

**Annotatsiya:** Mexatronika va robotatexnika qisqa vaqt ichida inson faoliyatining barcha sohalariga kirib bordi, fan va texnika taraqqiyotining ustuvor yo'nalishi sifatida shakllandi, ishlab chiqarish darajasini, mahsulot raqobatbardoshligini, hayot sifatini belgilaydigan "muhim texnologiyalar" ro'yxatiga kirdi. Shu bilan birga, mexatronik va robotatexnika tizimlar mashinasozlik va asbobsozlik sohalarida dastgohlar va avtomobillar, robototexnika va kompyuter texnologiyalari, shuningdek temir yo'l, aerokosmik, tibbiyot, ofis, harbiy va maishiy texnika kabi sohalarda, ya'ni sanoat sohasida keng qo'llanilmoqda. Ushbu maqolada Robotatexnika va mexatronikaning asosiy tushunchalari, uning maqsadi va vazifalari o'rganilgan. Shuningdek maqolad robotatexnika va mexatronikaning sanoat inqilobidagi ahamiyati hamda ta'siri tadqiq etilgan.

*Kalit so'zlar:* mexatronika, robotatexnika, sanoat 4.0, sanoat revolyutsiyasi.

Currently, mechatronics, along with informatics, bioengineering and nanotechnology, has a significant impact on the development of industrial and

household technospheres towards the increasingly widespread introduction of mechatronic automation and robotization systems into various physical and technical processes in all spheres of society.

The goal of mechatronics is to create intelligent physical and technical products, systems and processes that have qualitatively new functions, properties and capabilities. A special case of such physical and technical products are robots and robotic systems of various purposes and dimensions.

Modern mechatronics and robotics cover all dimensional scales of technical systems from «macro» to «micro» (sizes from 1 micron to 1 mm) with the subsequent transition from microsystems to Nano systems (about a hundred nanometers -  $10^{-7}$  m): the transition «macro-micro -nano-mechatronics and -robotics».

Mechatronics is a field of science and technology based on the system integration of precision mechanics units, sensors of the state of the external environment and the object itself, energy sources, actuators, amplifiers, computing devices (computers and microprocessors). A mechatronic system is a single complex of electromechanical, electrohydraulic, electronic elements and computer technology, between which there is a constant dynamically changing exchange of energy and information, united by a common automatic control system with elements of artificial intelligence.

Robotics is a field of science and technology focused on the creation of robots and robotic systems based on mechatronic modules (information-sensor, executive and control). Robots and robotic systems are designed to perform work operations from micro to macro dimensions, including replacing a person for heavy, tedious and dangerous work.

The mechatronics method is based on a systemic combination (synergetic combination) of such previously isolated natural science and engineering areas as precision mechanics, microelectronics, electrical engineering, computer control and informatics at all stages of the product life cycle, starting with marketing and design and continuing at the stages of implementation (production), operation and disposal. The mechatronics method is based on synergistic integration (unification) of structural elements, technologies, energy and information flows to achieve a single goal. It's no secret that robotics has changed industries vastly since their introduction into manufacturing plants over the last eighty years. As the global manufacturing industry enters its fourth revolution, innovations such as robotics and mechatronics, automation and artificial intelligence (AI) are set to take over.

The number of active industrial robots worldwide is increasing by approximately 14% year on year, and automation continues to create new types of robots with improved utility and function.

Factories of the future will likely feature robots and humans working side-by-side to meet consumer demand - a new world which business owners should

be prepared for. It's important to gain an understanding of what is meant by 'the fourth revolution', or 'industry 4.0'.

The human race has collectively experienced three industrial revolutions since the 1800s; each revolution has been characterized by an exciting new technology that improved manufacturing and processes for the better. The steam engine, the assembly line, and the computer have each been the catalyst for prior revolutions.

Industry 4.0 refers to the current industrial revolution that we find ourselves in, led by the evolution of robotics, automation, and the internet of things (IoT). Industry 4.0 heralds an age of 'smart' systems and digital integration; the name was coined in 2011, and the associated movement is sending ripples through almost every industry around the globe.

Figure 1 below illustrates the revolutions of Industry 4.0. It shows that mechatronics and robotics form the basis of the latest industry 4.0.

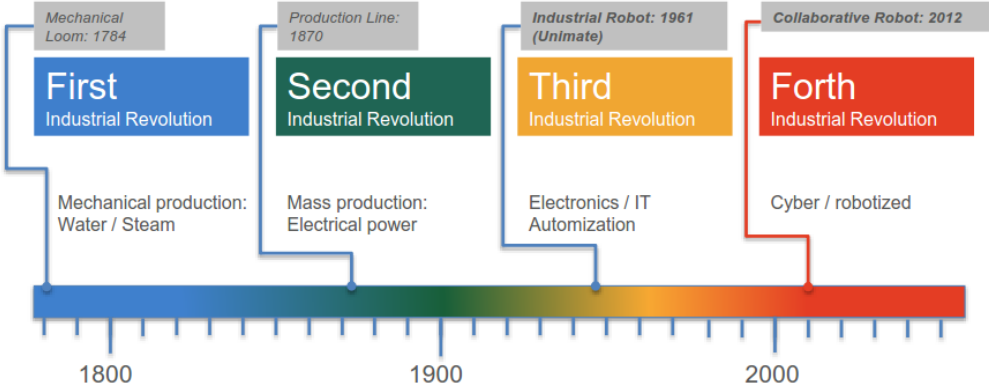


Fig. 1. Industrial revolution history

The development of robotics and mechatronics led to the recent industrial revolution. There are many reasons for this, but below are the 3 main effective ones are discussed.

**1. Improve productivity.** Based on current projections, AI is expected to have the ability to increase labour productivity by up to 40% by 2035.

Although some may see robotics and AI as tools to replace human workers, the International Federation of Robotics believes that less than 10% of jobs could be fully automated; robots are generally designed to take on repetitive tasks and allow workers to focus on more intensive duties. A major benefit of automation in large manufacturing operations is that some tasks could effectively be completed 24/7, thereby boosting production output without any additional labour costs.

Effective robotic completion of some tasks could be especially useful to small business owners. Small businesses generally cannot hire as large a workforce as manufacturing giants; automation may help to level the playing

field. In recent surveys, 57% of employers indicated an interest in boosting performance and productivity through automation and robotics. Some research has shown that increased use of AI in the workplace may actually create new job positions, allowing employers to hire more staff in the future.

**2. Lower overhead costs.** Although the initial cost of automated software or robots may be significant, the return on investment can be swift. Business owners might find that some roles are no longer required once AI is being utilized, saving costs immediately. As an example, some restaurant industry leaders are utilizing delivery robots, which reduces their need for human workers. With fewer employees taking part in hazardous work activities, businesses could also save on health and safety costs, with fewer injuries or time off work for their staff.

Many robots require only a small amount of space to operate, and can safely work alongside humans on assembly lines. The potential reduction in required space means that companies could also downsize to cheaper workplaces and factories. According to recent surveys, 24% of employers are currently considering automating some roles in order to reduce operating costs.

**3. Reduce human error.** Human error is a factor that every business must plan for, and time and energy are both spent rectifying the issues when they occur. Particularly when it comes to highly repetitive or mathematical tasks, automation could handle these with a far lower margin of error than human workers. As automation can be expensive to implement, it's critical that entrepreneurs take stock of their end-to-end processes, and decide where they can receive the biggest impact from AI.

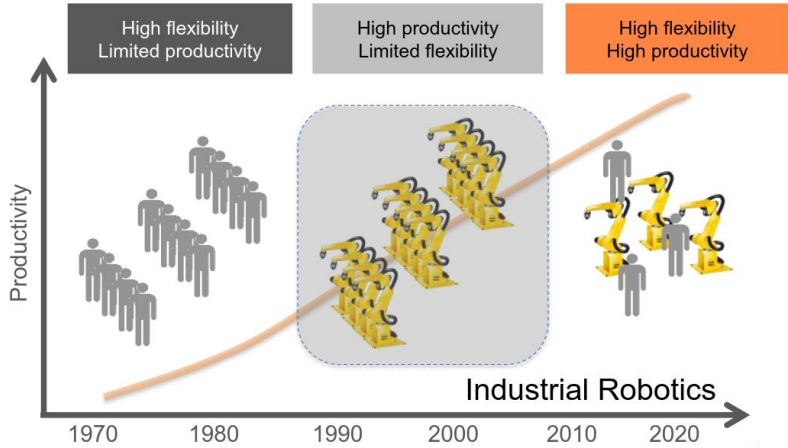


Fig. 2. Impact of robotics and mechatronics development to Industry productivity

Figure 2 clearly shows the impact of robotics and mechatronics on production efficiency. According to it, production without the intervention of robots and mechatronics has the lowest performance. In this case, production has high flexibility but limited productivity. If only robots are used in industry, on the

contrary, production efficiency will be high and flexibility will be limited. Therefore, production productivity and flexibility will be higher if human intervention is provided in the industry along with robotics and mechatronics. This underscores the importance of studying robotics and mechatronics in the educational process, training personnel and specialists in each industry.

### References

1. «30 Automation Statistics For The New Decade», Source: <https://kommandotech.com/statistics/automation-statistics/>
2. «What Is The Fourth Industrial Revolution?», Source: <https://txm.com/what-is-the-fourth-industrial-revolution-industry-4-0/>
3. «What Is Industry 4.0». Source: <https://insights.sap.com/what-is-industry-4-0/>
4. «The Benefits Of Automation In Today’s Workforce», Source: <https://www.forbes.com/sites/forbestechcouncil/2020/05/01/the-benefits-of-automation-in-todays-workforce/?sh=20473ab41cc8>

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## ФАРҒОНА ПОЛИТЕХНИКА ИНСТИТУТИДА “МЕCHAUZ” ЛОЙИҲАСИ “МЕХАТРОНИКА ВА РОБОТОТЕХНИКА” ТАЪЛИМ ЙЎНАЛИШИНИНГ ОЧИЛИШИГА АСОС БЎЛДИ

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**Аннотация.** Мақолада Фарғона политехника институтида MechaUz: “Ўзбекистонда “Мехатроника ва робототехника” бакалавриат таълим йўналишини инновацион ғоялар ва рақамли технологиялар асосида модернизация қилиш” лойиҳаси доирасида амалга оширилаётган ишлар ва эришилган натижалар ҳақида маълумот берилган.

**Калит сўзлар:** лойиҳа, мехатроника, технология, робототехника, инновация, адабиёт, машинасозлик, муҳандис, жамоа, лаборатория, жиҳоз, модернизация.

Мехатроника – механик воситаларни электрон, электротехник ва компьютер компонентлари билан бириктиришга асосланган янги модул, машина ва интеллектуал бошқарувли тизимларни лойиҳалаш ва ишлаб чиқишни таъминловчи фан ва техника соҳасидир. Бугунги кунда



жамиятимизнинг барча соҳаларига кириб келаётган ва фаолият кўрсатаётган мехатроника ва робототехника ишлаб чиқариш ва маиший техносферани ривожлантиришда, автоматлаштирилган ва роботлаштирилган интеллектуал тизимларини технологик жараёнларга жорий этишга катта таъсир кўрсатмоқда. Шу сабабли мехатроника ва робототехника соҳасида ишлайдиган юқори малакали ва рақобатбардош кадрларга эҳтиёж ортиб бормоқда.

Ўзбекистон Республикасида 2020-2022 йиллар давомида жорий этишга мўлжалланган MechaUz: “Ўзбекистонда “Мехатроника ва робототехника” бакалавриат таълим йўналишини инновацион ғоялар ва рақамли технологиялар асосида модернизация қилиш” халқаро лойиҳаси муваффақиятли амалга оширилмоқда. Лойиҳа Европанинг Erasmus+ дастури танлов натижалари асосида молиялаштирилмоқда.



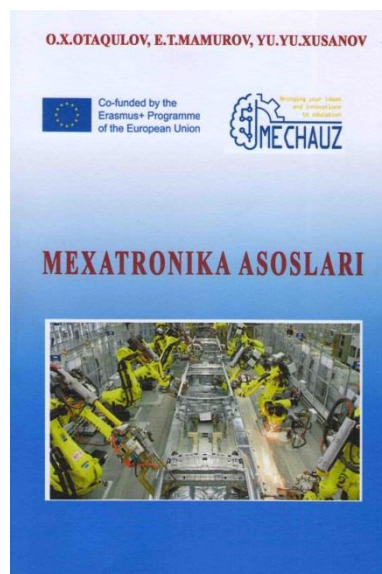
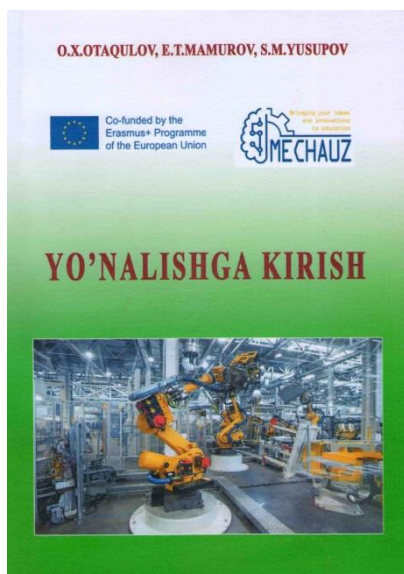
**1-расм. Фарғона политехника институтининг MechaUz лойиҳасининг ишчи гуруҳи (2020 й. январ)**

Халқаро лойиҳанинг ишида Греция, Латвия, Литва, Португалия Европа давлатларининг 6 та олий таълим муассасаси билан ҳамкорликда Ўзбекистон Республикасининг Андижон машинасозлик институти, Фарғона политехника институти, Тошкент давлат техника университети, Тошкент ахборот технологиялари университети, Тошкент шаҳридаги Турин политехника университети филиали, Қарши муҳандислик иқтисодиёт институти ҳамда Ўзбекистон Республикаси Олий ва ўрта махсус таълим вазирлиги иштирок этишмоқда.

Амалга оширилаётган лойиҳанинг мақсади Европа олий таълим муассасаларининг ютуқлари асосида ишлаб чиқариш ва таълим интеграциясининг янги ҳамкорлик шаклини жорий этиш, мехатроника ва робототехника соҳасида машинасозлик корхоналарида лойиҳалаш ишларини ва замонавий технологияларни амалга оширувчи муҳандисларнинг янги авлодини тайёрлашга замин яратиш, Ўзбекистон Республикасининг олий таълим муассасаларида янги “Мехатроника ва

робототехника” таълим йўналишларини очиш ва мавжудларини модернизация қилиш, Мехатроника ва робототехника соҳасига оид ўқув дастури, янги авлод ўқув адабиёт ва материалларни чоп этиш ва дастурий таъминотини яратиш, Европа тажрибаси асосида ўқитувчиларни малакасини ошириш, янги инновацион ўқув лабораторияларини ташкил этиш, янги ўқув дастур ва материалларни аккредитациядан ўтказиш, ўқув режа ва дастурларини модернизация қилиш бўйича кўникма ва тажрибалар асосида бошқа йўналишлар учун тавсиялар ишлаб чиқишдан иборатдир.

Бу борада Фарғона политехника институтида қатор ишлар бажарилмоқда. Лойиҳани амалга ошириш учун институтнинг Механика-машинасозлик ва Энергетика факультетлари “Машинасозлик технологияси ва автоматлаштириш“, “Ер усти транспорт тизимлари ва уларнинг эксплуатацияси” ва “Электроника ва асбобсозлик” кафедраси профессор-ўқитувчилари ҳамда талабаларидан ишчи гуруҳ шакллантирилди. Лойиҳанинг мақсади ва вазифаларидан келиб чиқиб ишчи режа ишлаб чиқилди ва тасдиқланди.



**2-расм. MechaUz лойиҳаси ишчи гуруҳи аъзолари томонидан Фарғона политехника институтида 2020-2021 ўқув йилида чоп этилган ўқув қўлланмалар (2020 й. декабр)**

Лойиҳа режасида кўйилган вазифани амалга ошириш мақсадида институт 5312600-“Мехатроника ва робототехника” таълим йўналиши очиш бўйича асосномаси тайёрлади ва уни Ўзбекистон Республикаси О ва ЎМТ вазирлиги қўллаб қувватлади. 2020-2021 ўқув йилида Ўзбекистон Республикаси Президентининг 2020 йил 12 июндаги ПҚ-4749 сонли қарори билан институтнинг Механика-машинасозлик факультети қошида янги 5312600-“Мехатроника ва робототехника” бакалаврият таълим йўналиши очилди ва биринчи курсга талабалар ўқишга қабул қилинди.



Янги очилган 5312600-“Мехатроника ва робототехника” таълим йўналиши учун Тошкент давлат техника университети томонидан ишлаб чиқилган ва Ўзбекистон Республикаси О ва ЎМТ вазирлиги томонидан тасдиқланган малака талаблари ва ўқув режалари олинди. Уларнинг асосида янги таълим йўналишига ишчи ўқув режалари ва ишчи дастурлари ишлаб чиқилди.

Мехатроника ва робототехника таълим йўналиши ўқув режасига ихтисослик ва танлов фанлари сифатида киритилиши режалаштирилган бир қатор фанларнинг ўқув материаллари Халқаро Гелленик университети, Вилниус техника университети, Лиапеза университети, Виано-Кастело политехника институти каби Европанинг ҳамкор олий таълим муассасаларидан олинмоқда. Жумладан, Мехатрон модулларининг ва роботларининг юритмалари, САD/САМ/САЕ тизимида макетлаш, Мехатрон модуллар ва уларни конструкциялаш, Мехатрон модуллар ва роботларнинг автоматлаштирилган лойиҳалаш тизимлари, Мехатроникада ишонччилик, Мехатрон модулларнинг ва роботларнинг инфор­мацион қурилмалари, Идентификациялаш тизимлари ва мехатроника тизимларини бошқариш, Роботлар ва робототехник тизимлар фанларига доир бўлган ва Европа Олий таълим муассасалари профессор-ўқитувчилари томонидан тайёрланган материаллар билан танишиб чиқилмоқда.

2020-2021 ўқув йилида институт ишчи гуруҳ аъзолари томонидан иккита ўқув қўлланма ва бир нечта илмий мақола ҳамда тезислар чоп этилди. Лойиҳа доирасида тарқатма материаллар тайёрланди, талабалар, магистрантлар, докторантлар, профессор-ўқитувчилар ва иш берувчилар учун конференция ва семинарлар ўтказилди. Институт веб сайтида лойиҳага бағишланган янги саҳифа очилди.

Лойиҳанинг натижасига қизиқиш билдирган “UZSUNGWOO” МЧЖ ҚК, “Евразия-ТАПО Диск” МЧЖ ҚК, Фарғона “Автотеххизмат-Ф” МЧЖ, “Автоойна” МЧЖ, “Фарғона механика заводи” МЧЖ ва “Uz-HANWOO ENGINEERING” МЧЖ ҚК каби корхоналарнинг фаолияти, уларнинг мехатроника ва робототехника мутахассисларига эҳтиёжлари, шу йўналишдаги муаммолари, ҳамкорликда мутахассисларни тайёрлаш имкониятлари ўрганиб чиқилди ва тегишли шартномалар расмийлаштирилмоқда.



**3-расм. Андижон машинасозлик институтида ўтказилган «RECTOR CUP 2021» робототехника танловида иштирок этган Фарғона политехника институтининг MechaUz лойиҳаси аъзолари (2021 й. январ)**

MechaUz халқаро лойиҳаси доирасида ишлаб чиқариш корхоналарида муҳандис техник ходимлар учун “SIEMENS NX” малака ошириш курслари ташкил этилмоқда. “SIEMENS NX” курсида замонавий техникани яратиш жараёнида техник вазифадан бошлаб ишчи лойиҳагача бўлган босқичларида услубий таъминот масалалари, автоматлаштирилган лойиҳалаш конструкторлик ишларининг бугунги ҳолати ва истиқболлари, лойиҳалар чизиш ва стандартларга тушуриш кўникмалари шакллантириш, лойиҳалаш ва дизайн масалалари, янги техникани яратишнинг асосий тамойиллари ва усуллари ўргатиш кузда тутилган.

2021-2022 йиллари давомида институтнинг бир қатор профессор-ўқитувчилари лойиҳа доирасида Латвия, Литва, Португалия каби Европа давлатлари олий таълим муассасалари тажрибаси асосида мехатроника ва робототехника йўналиши бўйича малакасини оширишлар режалаштирилган.

Лойиҳа ҳисобидан Ўзбекистондаги 6 та ҳамкор олий таълим муассасаларида янги ташкил қилинаётган Мехатроника ва робототехника инновацион ўқув лабораториялари учун бугунги кун талабларига жавоб берадиган замонавий жиҳозларга буюртма берилди.



**4-расм. Андижон машинасозлик институти ўтказилган «RECTOR CUP 2021» робототехника танловида Фарғона политехника институтининг жамоаси қўлга киритган дипломлар (2021 й. январ)**

Андижон машинасозлик институти томонидан 2021 йил 20 январ куни бўлиб ўтган “Талаба ва ёш педагоглар ҳамда корхоналарнинг ёш мутахассислари” республика “RECTOR CUP 2021” робототехника танловида Фарғона политехника институти MechaUz: “Ўзбекистонда “Мехатроника ва робототехника” бакалавриат таълим йўналишини инновацион ғоялар ва рақамли технологиялар асосида модернизация қилиш” халқаро лойиҳасининг иштирокчилари Ю.Ю.Хусанов ва Ш.М.Абдуллаевлар раҳбарлигида 37-20 М ва Р гуруҳ талабалари Д.О.Комилов, М.А.Орифжонова, Д.М.Абдумаликова, А.А.Шавкатов, О.Б.Собирова, Д.А.Жамолиддиновалардан иборат ROMOSMART ва FARPINATOR жамоалари иштирок этишди.

Институтнинг ROMOSMART жамоаси “Robo futbol” йўналишида фахрли II ўрини олиб Диплом ва 1 млн сўм пул миқдори билан, FARPINATOR жамоаси эса “Foydali model” йўналишида фахрли III ўринни эгаллаб Диплом билан тақдирланди.



**5-расм. Тошкент давлат техника университетида ўтказилган “ROBOT-UZ 2021” робототехника танловида Фарғона политехника институтининг жамоаси қўлга киритган ташаккурнома ва сертификатлар (2021 й. апрел)**

Ислон Каримов номидаги Тошкент давлат техника университети томонидан 2021 йил 9-10 апрель кунлари “ROBOT-UZ 2021” робототехника соҳасида иқтидорли ўқувчилар, талабалар, ёш педагог ва тадқиқотчилар, ҳамда корхоналарнинг ёш мутахассислари учун республика танловида Фарғона политехника институти MechaUz: «Ўзбекистонда “Мехатроника ва робототехника” бакалавриат таълим йўналишини инновацион ғоялар ва рақамли технологиялар асосида модернизация қилиш” халқаро лойиҳасининг иштирокчилари Ю.Ю.Хусанов ва Ш.М.Абдуллаевлар ҳамда талабалар Д.О.Комилов, А.А.Шавкатов ва Н.М.Абдувалиевдан иборат ROMOSMART ва FARPINATOR жамоалари иштирок этишди. Жамоалар танловда ташаккурнома ва сертификатлар билан тақдирланди.

2021 йил март ойида Фарғона политехника институтининг MechaUz лойиҳаси жамоасининг вакиллари Тошкент шаҳрида “Transformers Education” ўқув марказида Робототехника ва Мехатроника бўйича ўқитувчи

тайёрлаш базавий курсини муваффақиятли тамомладилар. Ўқув курсида олинган билимлар асосида профессор-ўқитувчилар талабаларга робототехника ва мехатроника соҳасида билим бермоқдалар.

MechaUz лойиҳаси доирасида Фарғона политехника институтида ўқув лаборатория хонаси ташкил этилиб янги замонавий жиҳозлар билан жиҳозланди. MechaUz лойиҳаси маблағлари ҳисобидан ўқув лабораториясига қуйидаги замонавий жиҳозлар олиб келинди:

1. Robot Arm Mover User Guide лаборатория роботи.
2. System Unit Train CO4204-7X чизиқли ҳаракат қурилмаси.
3. System Unit Train CO4204-7Z асинхрон двигатель қурилмаси
4. System Unit Train CO4204-7W қадамли электр юритма

Янги лаборатория қурилмаларни ишлатиш ва бошқариш бўйича услубий кўрсатмалар тайёрланмоқда. Ҳозирги кунда MechaUz ўқув лабораторияси хонасида талабаларга амалий ва лаборатория машғулотлари машғулотлар ўтказилмоқда.



**6-расм. Фарғона политехника институтидаги MechaUz лойиҳасининг ўқув лабораторияси (2021 й. сентябр)**

Лойиҳанинг амалга оширилиш режасига асосан 2020 йил 11-13 феврал кунлари Грецияда MechaUz лойиҳасининг биринчи учрашуви бўлиб ўтди. Учрашув давомида Фарғона политехника институтига лойиҳанинг “Dissemination and exploitation”га оид вазифаларни бажариш таклиф этилган. “Dissemination and exploitation” лойиҳанинг давомида ва тугатилгандан сўнг доимий ишлаш талаб этилган, лойиҳани оммалаштиришда, ахборотларни жамоатчиликка улашиш ва тарқатиш фаолиятини олиб бориш учун мўлжалланган. Шу билан биргаликда лойиҳа, унинг мантиқий асослари, мақсадлари, шериклик, лойиҳанинг бориши, молиялаштириш ва Ўзбекистонда “Мехатроника ва робототехника” бакалавриат таълим йўналишини инновацион ғоялар ва рақамли технологиялар асосида модернизация қилишнинг аҳамиятини тушунтириш. Жамоатчилик ва истеъмолчилар бу соҳанинг ижтимоий ва маданий жиҳатдан хабардор бўлишларини таъминлашдан иборат. Шунингдек, билимларни самарали ва фаол равишда узатиш, натижада турли аҳоли қатламлари, охириги фойдаланувчилар томонидан қабул қилинади ва эксплуатация қилинади, бу эса MechaUz учун ўлчовли таъсир кўрсатади, шу



билан бирга MechaUz ва интеллектуал мулк тўғри бошқарилишини таъминлайди.

“Dissemination and exploitation” режаси Фарғона политехника институти томонидан ишлаб чиқилган ва уни мувофиқлаштириш учун масъулдир. Барча лойиҳа иштирокчилари, ўз мамлакатларида ва ўз жамоаларида, лойиҳанинг натижаларини етказиш ва тарқатишда иштирок этадилар. Самарали оммалаштириш, технология ва билимларни узатиш ҳамда салоҳиятни ошириш учун ушбу махсус иш пакети MechaUz лойиҳасининг бир қисмидир. У лойиҳа бошланганидан сўнг қайта ишланди ва амалга оширилмоқда. Лойиҳанинг амал қилиш муддати давомида доимий равишда кўриб чиқилади ва вақти-вақти билан янгиланади.



Фарғона политехника институти қуйидаги ижтимоий тармоқлардаги аккаунтларни ишлаб чиқиш ва юритишни назорат қилмоқда: Facebook, Twitter, YouTube ва Instagram. Facebook саҳифасига мақсадли аудиториямизга бўлажак воқеалар, лойиҳа натижалари ва янгилик, тадбиркорлик ва стартаплар ҳақидаги қизиқарли янгиликлар ҳақида хабардорликни ошириш учун маълумот бериш учун ишлатилмоқда. Twitter аккаунтимиз манфаатдор томонлар ва сиёсатчилар учун яратилган. Instagram ижтимоий медиа тармоқ бўлиб, ундан асосан ёш авлод фойдалаши учун яратилган. YouTube ижтимоий тармоғидаги каналимиз конференциялар, семинарлар, онлайн учрашувлар ва бошқа иштирокчилар ёзган видео файлларни тарқатиш учун мўлжалланган. Лойиҳа давомида барча ҳамкорлар учун минимал ва мунтазам жойлаштириш схемаси учун ижтимоий тармоқларнинг контент режаси белгиланган.



**7-расм. MechaUz лойиҳасининг медиа материаллари (2021 й. июнь)**

# ART AND ENTREPRENEURSHIP AS TWO COMPONENTS OF SUCCESS IN LIFE

(Erasmus+ Project “MUSAE”, 609821-EPP-1-2019-1-IT-EPPKA2-CBHE-JP)

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**Аннотация.** Erasmus+ “MUSAE: Multidisciplinary Skills for Artists' Entrepreneurship” лойиҳаси бўлажак rassom ва мусикачиларда мустақил равишда ишга жойлашиш имкониятини самарали юксалтириш мақсадида, уларда ишбилармонлик кўникмаларини ҳосил қилиш ва ривожлантиришга йўналтирилган. Мақолада охириги 12 ой ичида лойиҳа бўйича олиб борилган ишлар ҳақида асосий маълумотлар келтирилган.

**Аннотация.** Проект Erasmus+ “MUSAE: Multidisciplinary Skills for Artists' Entrepreneurship” направлено на подготовку и развитие навыков предпринимательства с целью эффективного повышения самостоятельной возможности трудоустройства у будущих художников и музыкантов. В статье представлена основная информация по проведенным работам по проекту за последние 12 месяцев.

**Abstract.** The Erasmus+ project “MUSAE: Multidisciplinary Skills for Artists' Entrepreneurship” is aimed at training and developing entrepreneurship skills in order to effectively increase self-employment opportunities for future artists and musicians. The article provides basic information on the work carried out on the project over the past 12 months.

## 1. Introduction

The Erasmus+ project “MUSAE: Multidisciplinary Skills for Artists' Entrepreneurship” was received in November 2019. The work on the project was officially started on January 15, 2020. Project participants are 14 institutions from 6 countries, including Italy (Conservatorio di Musica “Alfredo Casella”, University of L'Aquila, Accademia di Belle Arti di L'Aquila - Academy of Fine Arts of L'Aquila), Belgium (Artesis Plantijn Hogeschool Antwerpen), Finland (JAMK University of Applied Sciences), Palestine (Palestine Polytechnic University, Dar al-Kalima University College of Arts and Culture, Birzeit University), Tunisia (The University of Sfax, Institut Supérieur de L'animation pour La Jeunesse et La Culture de Tunis) and Uzbekistan (National Institute of Fine Arts and Design named after Kamoliddin Bekhzod, Toshkent Shahridagi Turin Politexnika Universiteti (Turin polytechnic university in Tashkent), State Conservatory of Uzbekistan and Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan).



Conservatorio di Musica “Alfredo Casella” (Conservatory of Music “Alfredo Casella”, Italy) is the main coordinator of the project. The Turin Polytechnic University in Tashkent is the coordinator of MUSAE in Uzbekistan.

The main goal of the project is to develop entrepreneurship skills and start a successful career for students of creative professions after receiving diplomas, teaching them the basics of creating successful projects and strengthening ties with international partners. Creative professions in the project were understood as musicians, singers, dancers, composers, designers, artists, actors.

However, due to the fact that project participants are mainly universities, which teach specialties related to music and design, the project was aimed basically at these specialties. The curricula and teaching programs prepared as a result of the project can be adapted for students of other creative specialties in the future.

Despite the fact that at the beginning of the project, quarantine restrictions associated with a pandemic arose, the work on the MUSAE project began and the first results were already obtained by now. Over the past 12 months, a lot of work has been done, including the conduct of educational trainings. In addition to trainings, several online meetings with foreign partners were held, as well as several meetings between partner universities of Uzbekistan, at which the current project problems were discussed, preparation of local reports on the work done, as well as the prospect and ability to prepare educational materials in accordance with the requirements of a particular university.

## **2. Conducting tests and preparatory information collection**

As is known before submitting any educational material, especially if it refers to the training of specialists, one need to collect some information related to the need to introduce certain curricula or educational courses.

The project work began with the preparation of questionnaires and conduct a survey of staff members and students of universities as well as possible employers. Preparation of questionnaires was engaged in the Academy of Fine Arts of the city of L’Aquila (ABAQ, Italy). Questions for university staff included issues such as existing curricula and general issues on the organization of such programs.

Issues for students included, except for general information, many questions related to their study subjects, future specialty and plans for the future. In addition, some of the questions were devoted to what knowledge students would like to get to use in their future activities. Such questions made students think about what they were going to do after graduating from the university that they are already able at the moment, what knowledge they received and what knowledge they are still needed to start or continue their professional activities at the moment or after graduation university.

Thus, on the basis of this survey, each university plans to create its own educational course, including the most required and necessary issues.

### 3. Workshops and trainings

From April to June of 2021, several online trainings (workshops) were organized by European project partners. Trainings were very interesting and included discussions and interviews as well as video materials. In particular, participants in the trainings got acquainted with some principles in organizing training of future artists. Future artists, with the subjects in the specialty, simultaneously study academic subjects related to the creation and successful career after receiving a diploma.

Various existing projects related to performances and concerts organized by students of European project partners are presented on these workshops. They used various recent achievements and developments from the field of information technologies, including volumetric lighting effects, unusual solutions and their original presentation in these performances.

Trainings and seminars were organized by Artesis Plantijn Hogeschool Antwerpen (Belgium), JAMK University of Applied Sciences (Finland) and Conservatorio Di Musica "Alfredo Casella", University of L'Aquila, Accademia Di Belle Arti Di L'Aquila - Academy of Fine Arts of L'Aquila (Italy). Each workshop was devoted to certain issues in teaching students used in these universities. Particularly interesting in all these trainings was acquaintance with the fact that future artists teach management, entrepreneurship and ways to build a career, and this is given enough time.

The first, introductory, training was organized by the Antwerp University College of Artesis Plantijn (Belgium) and continued for three days. Training participants met with the basics of entrepreneurship and how it is connected with musicians, artists, singers and other employees of creative professions.

In particular, during training the basics of entrepreneurship of students of creative professions pay great attention to the practical work of students. They are engaged in cooperation with people who will help them in their activities. The future artist should understand well how and where he can start building his career so that it becomes successful and disappointed it in the future.

In order to study the foundations of entrepreneurship, the student should strive to develop his abilities, try to be independent and at the same time be able to work in a team.

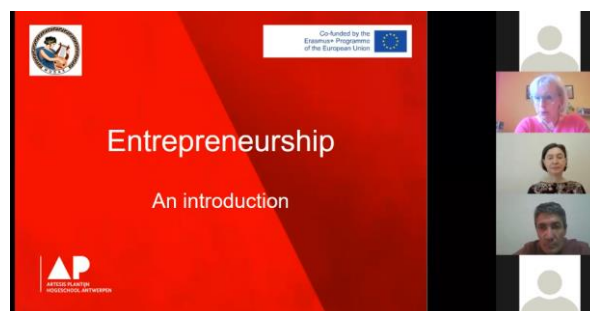


Fig.1. Screenshot of a workshop on entrepreneurship, organized by Artesis Plantijn Hogeschool Antwerpen (Belgium).

In addition, entrepreneurship course is closely related to various design practices. Therefore, the skills that are trained in this course are developing many different qualities that can be useful not only in the professional activities of future artists, but also in any other direction of activity, including ordinary life.

To become a successful artist (musician, composer, designer, a singer, a dancer or artist), independent (if possible) from various circumstances, it is required to elaborate a strategy for the development of the future career, which consists from various components. Since advertising is currently playing a big role, it occupies an important place in the work of any artist, since the artist is more independent personality. Proper advertising is a significant part of success. You can be very talented, but if no one knows about you, you will remain in recent roles.

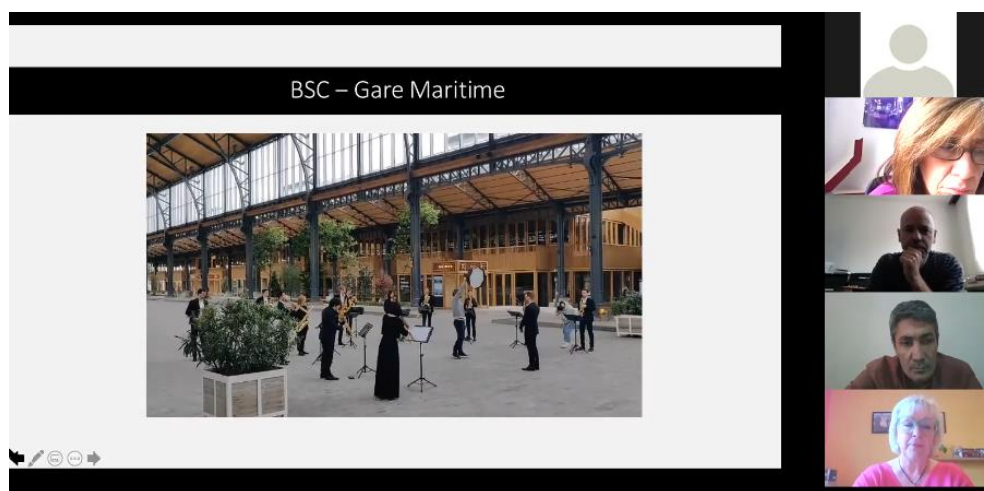


Fig. 2. Screenshot of the training (workshop) with performance of the original concert organized by young musicians at the train station.

In addition to advertising, one need also to choose the brand that will become a business card for artist (painter, musician etc.). You can create or choose a specific style in clothes, a certain (own) direction in music, dancing, and concert performance. For example, a business card characteristic of cultures of different countries is the creation of its (special) style in clothing, music or in the theater performance.

An important component for the work and development of a career of any artist is the license and other necessary legal documents (contracts, etc.). Such questions also pay enough attention to training.

Subsequent workshops organized by other European universities were devoted to the detailed main topics defined in the first introductory seminar, as well as other issues related to training the basics of entrepreneurship. In particular, interviews were presented with students successful in their career and former graduates of these universities. They told about what their career began and what allowed them to become successful in their field.

In addition to the lecture part of the trainings, part of the time was devoted to discussing the topics presented during the seminars, as well as answering the questions that the participants had.

Despite the difficulties associated with organizing online seminars, time difference, difficult environment due to the pandemic and other circumstances, the seminars were quite well organized and quite successful. The knowledge gained during the trainings will be used by the participants in the future to prepare, together with the European partners, curricula and educational materials for organizing academic courses and trainings in their universities.

#### **4. Conclusion**

The first year and a half of the project is over. Although it is too early to summarize, now we can already say that this is a unique project in every respect that made it possible to bring such different countries and people of different nationalities closer together, allowing them to become part of one team in joint work to educate students, create new cooperation between future professionals of creative specialties and, possibly, the creation of new joint creative teams, works and new projects.

Although due to the ongoing quarantine restrictions, there are no opportunities to meet in person with all project participants, our communication continues online. And work on our common project is also continuing.

#### **References:**

1. [www.musae-project.com](http://www.musae-project.com)
2. Materials of online workshops and trainings of the MUSAE project.
3. <https://musae.polito.uz/>

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## **ENHANCING CORE COMPETENCIES OF ENTREPRENEURIAL EDUCATOR IN ART HIGHER EDUCATION OF UZBEKISTAN IN THE FRAME OF MUSAE**

**(609821-EPP-1-2019-1-IT-EPPKA2-CBHE-JP Multidisciplinary Skills for Artists'  
Entrepreneurship)**

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**Abstract.** The need for entrepreneurial knowledge and skills in the arts is quite acute, which encourages the development of common approaches to the issues of methods and practice of teaching entrepreneurship in higher education. MUSAE is one of the successful practices for the development and enhance of entrepreneur educator skills.

**Аннотация.** Потребность в предпринимательских знаниях и навыках в области искусства стоит достаточно остро, что способствует выработке единых подходов к вопросам методики и практики обучения предпринимательству в высшем образовании. MUSAE - одна из успешных практик по развитию и совершенствованию педагогических навыков предпринимателей.

**Annotasiya.** San'at sohasida tadbirkorlik bilim va ko'nikmalariga bo'lgan ehtiyoj oliy ta'limda tadbirkorlikni o'qitish usul va amaliyotiga yagona yondashuvni ishlab chiqish zaruratini keltirib chiqardi. MUSAE - bu tadbirkor pedagog mahoratini oshirish va takomillashtirish bo'yicha eng muvaffaqiyatli amaliyotlardan biridir.

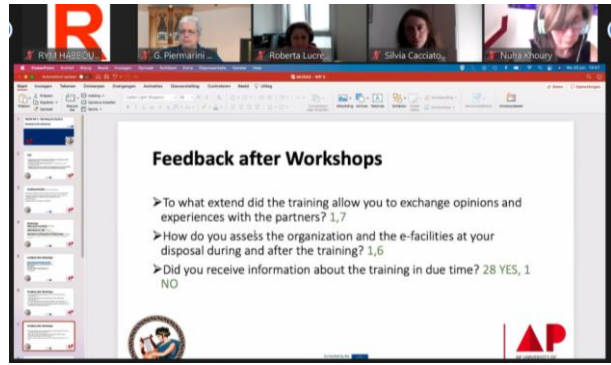
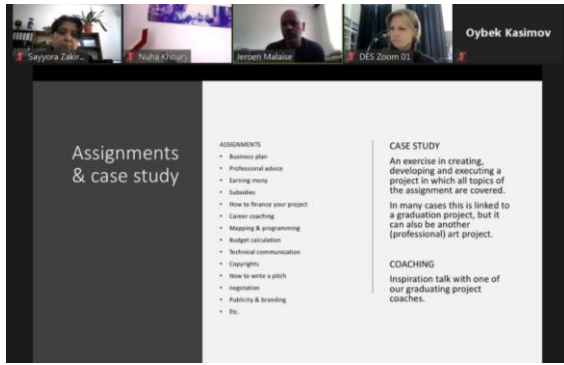
## **Introduction**

The debate about whether art universities should include entrepreneurship modules in their educational programs does not stop. Such an argument often sounds: not all practical activities should be reflected in university education programs. After all, art university is not the highest commercial courses, it is a special type of educational institution whose task is to form the country's intellectual and cultural elite. Note that not all the skills necessary for life should be formed by a university, but it can form those in which there is a social need. For any entrepreneurial activity, in addition to knowing the technology of a particular industry or type of activity, the same competencies are needed to discover new chances and the ability to realize them, attracting the missing resources. And if students gain knowledge of technology within the framework of their main educational programs, then entrepreneurship skills can be mastered in joint training and project activities, particularly in MUSAE (609821-EPP-1-2019-1-IT-EPPKA2-CBHE-JP Multidisciplinary Skills for Artists' Entrepreneurship)

## **WP 2: Retraining sessions for teachers**

The retraining sessions for teachers were convened by Programme Country partners on April-June, 2021 in online format.

The first workshop themed “Creating a course on Entrepreneurship in the Arts, the sequel: perspective from a teacher, an institution and the professional field” was run by Artesis Plantijn Hogeschool Antwerpen.

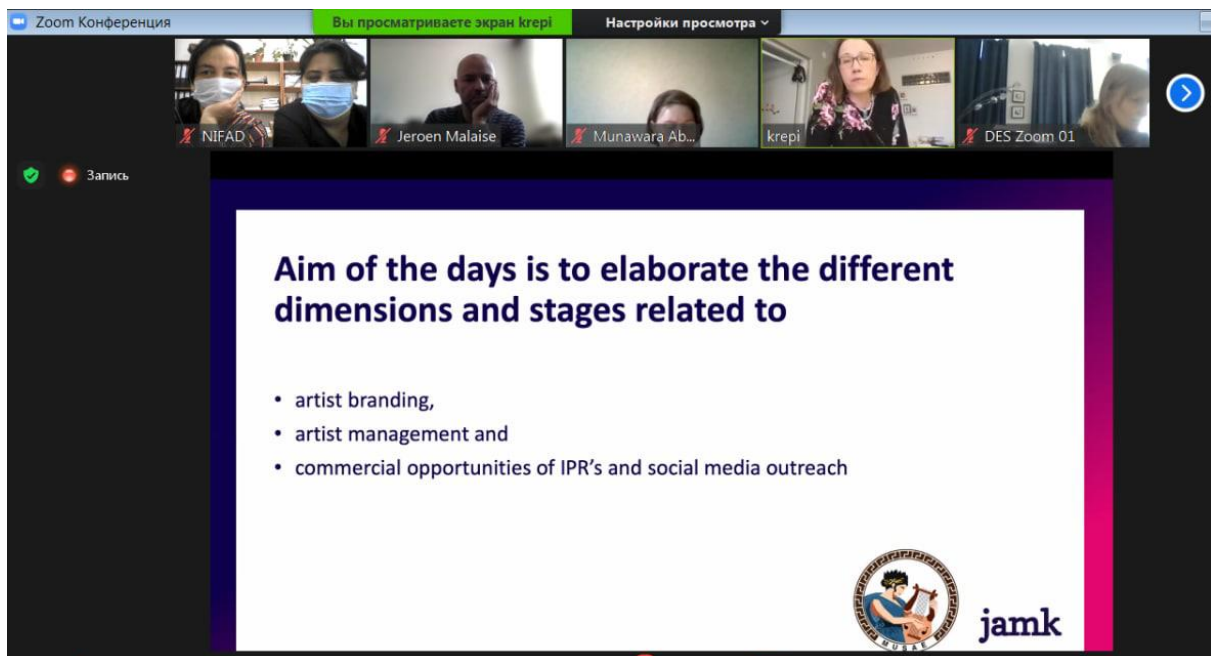


JAMK held MUSAE workshop #2. The purpose was to discuss the following:

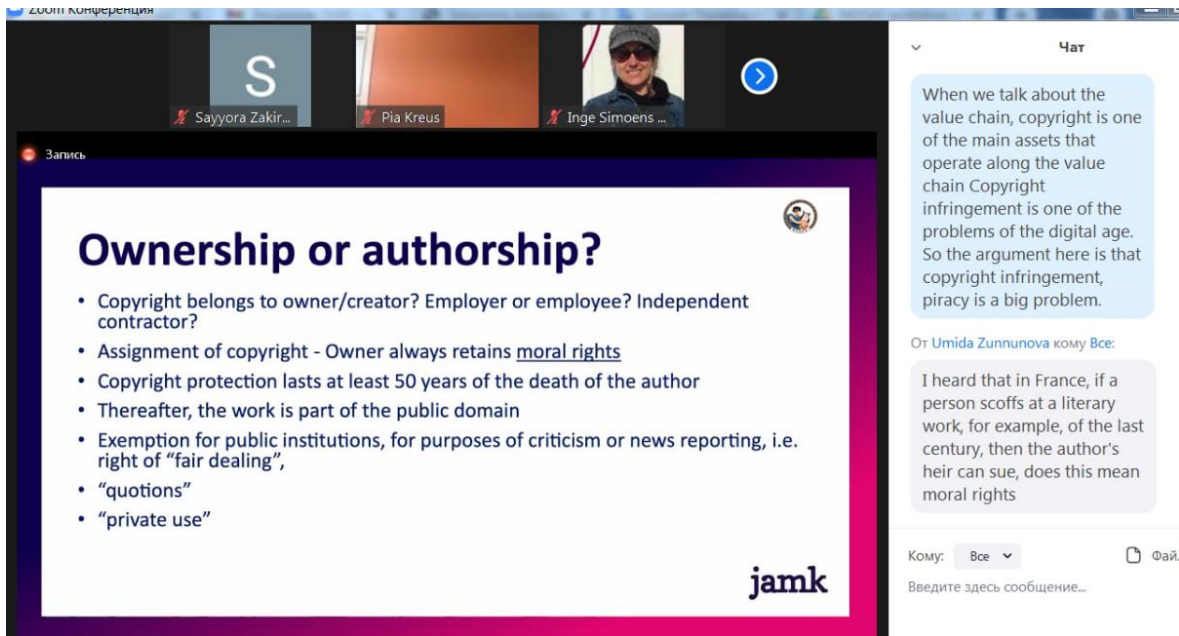
- Artist branding
- Artist management (development)
- Sponsorship/partnership agreements

The content was included from

- The goal is to create a development plan for the artist case introduced in this presentation.
- The plan serves as a roadmap in the artist development and will give an overall understanding of the commercial potential of artist acts when establishing an international career in music.
- The development plan helps to clarify key considerations and to manage the "right things" in order to establish clear goals for the artist and her management team.

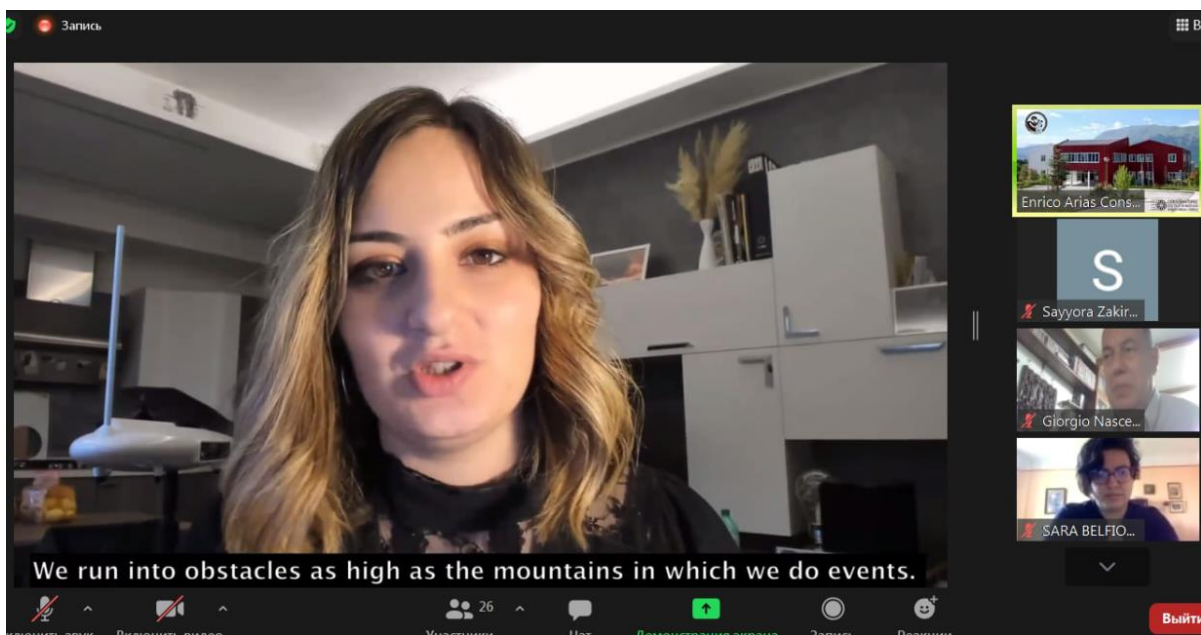






CONSAQ : "Learning from our students".

In this meeting CONSAQ presented some experiences of students or former students who had implemented entrepreneurial initiatives in different fields of sound and musical arts. Some of these initiatives are already standing on their own feet while others have a great potential for becoming business ventures. Through a collaborative path of co-creation and the knowledge acquired in the previous workshops, the key points that underlie the conception and implementation of an entrepreneurial project were identified by participants together.





Interviews with students about their entrepreneurial experience in:

- multidisciplinary perspectives on composition and performance
- cognitive development and sound perception.
- Erasmus+ traineeship, a valuable opportunity to strengthen students' future careers

UNIVAQ and ABAQ ran workshop on “Entrepreneurship and territory: some good practices (from videomapping to artists groups)”.

UNIVAQ:

- **Introduction.** Innovative teachings modules:  
Videomapping. How to use audiovisual projection technologies to musealize the city of L’Aquila (**M. Lino**)
- **From teaching to realization:** How to create a Videomapping event (administrative, creative and planning issues) (**M. Lino**)
- **The dissemination of research:** How to archive the products of videomapping installations (**M. Lino**)

ABAQ:

- **Introduction:** Do we need more artists-entrepreneurs or more entrepreneurs who understand the value of art? (**S. Manganaro**)
- **How to use creativity to activate synergies with the territory:** some concrete examples where students, entrepreneurs and institutions are a catalyst for the Abruzzo region (**M. Coccia, F. Fiorillo, S. Manganaro**)

## Conclusion

Effective entrepreneurship education is dependent on both university culture and educators. Entrepreneurship teaching involves encouraging students to determine the right questions, be creative and confident enough within their own capacity to take the necessary risks required to succeed. Retraining sessions for teachers held

for academic staff of NIFAD, SCU and TTPU gave an opportunity to get know the new best European practices and knowledge. The core competencies of entrepreneurial educator were analyzed. We concluded could the following entrepreneurial skills that be applied with core competencies generally for Uzbekistan.

The attributes of the entrepreneurial educator

## **Main activities and responsibilities**

*Innovative*  
*Relevant*

### **Teaching and Learning Support**

Design and development of new or existing programmes with deliver effective Enterprise and Entrepreneurship curricula. Teach a range of materials on entrepreneurship

Develop and apply innovative and appropriate teaching techniques and material which create interest, understanding and enthusiasm amongst students

*Reflective*

### **Research, enterprise and scholarship**

Engage in knowledge generation, knowledge exchange and knowledge transfer activities

Undertake and contribute to research, conducting individual research or collaborating with others

Conduct individual or collaborative scholarly projects

*Engaging*

### **Liaison and Networking**

*Enterprising*

Develop links with external contacts such as other educational bodies, employers and professional bodies to foster collaboration

Interact and collaborate with other internal departments and faculties

*Inclusive leadership*

### **Team Working**

Provide academic leadership to those working within programme areas, for example by agreeing work plans to ensure that programmes are delivered effectively or organising the work of a team by agreeing objectives and work plans

*Enabling*

### **Student Support**

Supervise research degree students as

appropriate

Supervise student projects and placements as appropriate

### **Acknowledgements and Legal Notice.**

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### **References:**

1. <https://panopto.jamk.fi/Panopto/Pages/Sessions/List.aspx?folderID=63eaac35-66c6-43ae-b2c1-ad3c00c24f9d>
2. B. Sayfullayev. Trends in the development of art theater in Uzbekistan.// International scientific practical conference. NIFAD. 2021.
3. S.Zakirova, U. Zunnunova. Information technologies in management //International Journal on Integrated Education. -2019-Vol. 3. No 1. P. 19-22.
4. U. Zunnunova, S. Zakirova. Academic and organizational aspects of entrepreneurship education in art universities of Uzbekistan. Journal of critical reviews//doi:10.31838/jcr.07.13.298
5. U. Zunnunova. Development Trends of the Organization of Information Processing at the Enterprise//International journal of advanced research in science, engineering and technology.-2020-Vol.7.No.2. P. 12963-12966
6. S.Zakirova. The Role of IT-Management in the Development of Information Technologies//International journal of advanced research in science, engineering and technology. -2020-Vol.7.No.2. P.12959-12962

# ANALYSIS AND COMPARISON OF MECHATRONICS TEACHING SYSTEMS IN EU AND UZBEKISTAN: TOWARDS THE DEVELOPMENT OF A BACHELOR DEGREE IN UZBEKISTAN THROUGH INNOVATIVE IDEAS AND DIGITAL TECHNOLOGY

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## Abstract

This paper aims to present some of the main findings of the work package one (WP1) of the “Modernization of Mechatronics and Robotics for Bachelor degree in Uzbekistan through Innovative Ideas and Digital Technology (MechaUz)” Erasmus+KA2 project (2020-2022). The work package aimed, primarily, to implement an analysis and comparison of mechatronics teaching systems and methods in HEIs of EU and Uzbekistan, at both undergraduate and graduate level.

## 1. Introduction

Mechatronics has been identified as an interdisciplinary field. The main characteristic in mechatronics is the synergism and integration of mechanical engineering, computers, control systems and electronics in the design process (Craig and Stoffi, 2002).

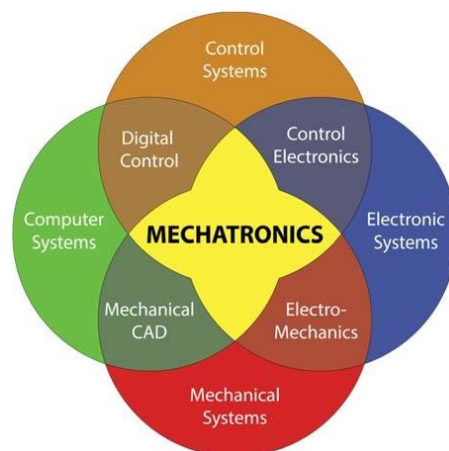


Figure 1: Mechatronics synergism and integration in the design (Craig and Stoffi, 2002).

It has been defined as “an intelligent and unifying paradigm, that offers an area of interdisciplinary knowledge and interactions regarding ways of working and thinking, practical experiences, as well as theoretical knowledge” (Maki et al., 2013; Liliana and Florina, 2015). There is no unique definition of Mechatronics, based on the findings of WP1. As a result, different Mechatronics degree programmes, at both the bachelor and master degree level, present their own perspective of Mechatronics. A mechatronics definitions, based on the findings of WP1, follows.

“Mechatronics is a fusion of mechanical, electrical and control engineering. In order to compete successfully in a global market, modern manufacturing companies must have the ability to integrate electronics, control, software and mechanical engineering into a range of innovative products and systems. Graduates of this programme will have this interdisciplinary knowledge, skill and approach to engineering.” (BEng Mechatronics, School of Engineering, University of Glasgow (UK)).

An analysis and comparison of mechatronics teaching systems and methods in HEIs of EU and Uzbekistan, at both undergraduate and graduate level was implemented in WP1 of the MechaUz project. Furthermore, the studying experience of the EU MechaUz partners in the implementation of standards, curriculum and teaching materials in the field of Mechatronics was investigated and identified. Finally, a list of good practice examples, based on the studying experience of the EU partners, was compiled.

## **2. Methodology**

A template (MechaUZ - Working Template for WP1) was used by the MechaUZ Partners for filling out information required for the completion of the relevant tasks 1 in WP1. The collected information has been included in appendix B. The template was introduced by the MechaUz coordinator and WP1 leader, the International Hellenic University (IHU).

The template was divided into Part A and Part B. Part A involved the analysis and comparison of mechatronics teaching systems and methods in HEIs of EU and Uzbekistan.

Data on Part A included bachelor and/or master degrees in Mechatronics for EU and Uzbekistan. The programmes listed for each country of interest should cover the essential information about the corresponding teaching systems in the respective countries and therefore the provided list of relevant degree programmes should not be exhaustive. Information in Part A included (for each identified bachelor/master degree programme): programme title; department; University; Country; URL; degree of study programme; ECTS; duration (in years); language; bachelor project; teaching methodology (Theory, lab sessions, development of projects, connection with industry, seminars, other); course-specific learning aims/outcomes/competences; the structure of the programme;



profile of the programme (distribution of the course subjects); and any further comments (such as collaboration with industry, industrial experience, etc.).

Information in Part B included a list of good practice examples. Partners were asked to provide their own studying in the implementation of standards, curriculum and teaching materials in the field of Mechatronics. They could also list URL addresses.

### **3. WP1 Results – Discussion**

Detailed results and relevant discussion have been included in the report of WP1 of the MechaUz project.

#### **3.1 Mechatronics and Mechatronics related programme titles at a bachelor degree level**

In total, 50 bachelor degree programmes from 24 countries were identified, in EU and UK. Degree programmes in EU and UK include Mechatronics, Mechatronics Engineering, combined degrees such as Mechatronics and Robotics, Mechatronics and Business Management and Automotive Mechatronics.

Other degree programmes include Automation Engineering, Automation and Control Engineering, Informatics: Robotics and Intelligent Systems, Automotive Engineering, Mechanical and Manufacturing Engineering, Production Engineering and Management and Industrial Engineering and Management.

In Uzbekistan, degree programmes include Mechatronics and Robotics and Computer Engineering.

#### **3.2 Mechatronics and Mechatronics related programme titles at a master degree level**

29 master degree programmes from 14 countries were identified, in EU and UK. Degree programmes in EU and UK include Mechatronics, Mechatronics Engineering and combined degrees such as Mechatronics and Robotic Engineering, Mechatronic systems for Industry and Medicine, Control for Green Mechatronics, Mechatronic systems and advanced mechanics and Mechatronics and Business Management.

Other degree programmes include Informatics: Robotics and Intelligent Systems, Automation and Control Engineering, Automation Systems, Robotics and Automation Engineering, Strategic Product Design, Manufacturing and Welding Engineering Design and Mechanical and Manufacturing Engineering.

In Uzbekistan, master degree programmes include Mechatronic Engineering (Control Technologies for Industries 4.0) and Mechatronics and Robotics.

#### **3.3 Programme duration**

The duration of the bachelor degree programmes in Mechatronics or related degrees in EU, UK and Uzbekistan varies between 3-5 years. Specifically, 16 bachelor degree programmes have a duration of 4 years (34.8%), 22 programmes

have a duration of 3 years (47.8%), 4 programmes have a duration of 3.5 years (8.7%) and 4 programmes have a duration of 5 years (8.7%).

### **3.4 Teaching methodology**

Teaching methodology includes different combinations of lectures, laboratory classes, individual and group projects, connection with industry, internships and tutorials. Laboratory work is integrated in all bachelor degree programmes. High tech laboratories are highlighted in some degree programmes.

### **3.5 The course profiles by subjects**

For each identified course at a bachelor degree programme, the course profile was described in a Table which included the main fields of study. The results varied among different countries. Detailed results have been included in the WP1 report of the MechaUz project. Indicative results from bachelor degree programs in France and Portugal follow.

#### **France**

<b>Subject</b>	<b>Percentage of the total course modules</b>
Mechanical Engineering	9-19%
Electrical/Electronic Engineering	9-15%
Computer Science/ ICT	0-7%
Mechatronics	22-49%
Fundamental subjects	21-51%

#### **Portugal**

<b>Subject</b>	<b>Percentage of the total course modules</b>
Mechanical Engineering	17-20%
Electrical/Electronic Engineering	30-32%
Computer Science/ ICT	10-19%
Mechatronics	8-17%
Fundamental subjects	14-32%

### **References**

Craig K, Stolfi F. (2002). "Teaching control system design through mechatronics: Academic and industrial perspective", *Mechatronics*, 12(2), pp. 371–81.

Liliana D., Florina P.S. (2015). Education, Knowledge and Innovation from a Mechatronics Perspective, *Procedia – Social and Behavioral Sciences*, vol. 203, p. 205.

Maki, K., Habib and J. Paulo Davim (2013). *Interdisciplinary Mechatronics: Engineering Science and Research Development*, Wiley-ISTE.

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## THE ROLE OF TRIGGER PROJECT IN THE EMPLOYMENT OF UNIVERSITY GRADUATES IN UZBEKISTAN

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**Abstract:** One of the most important priorities today is the employment of graduates of higher education institutions and the formation of entrepreneurial skills in them. It is no secret that the quality of education and the conditions created for our young people to get higher education or to graduate as qualified professionals depend on the conditions created. The fact that the theoretical knowledge currently provided by higher education institutions must be implemented in consultation with employers is very important in a developing market environment. This article describes the ongoing deeds and expected results under the EU Erasmus+ project “Triggering innovative approaches, entrepreneurial skills and attitudes in HEI learners through creating the favourable conditions for graduate’s employability in Central Asia - TRIGGER”.

### **Introduction.**

It should be noted that due to the attention paid to young people in our country and the creation of a modern education system for them, today youth issues have risen to the level of state policy. On July 16, 2021, at a video conference chaired by President Shavkat Mirziyoyev on the priorities of the higher education system, consistent development of the education system in order to provide young people decent education, to train specialists in line with world standards has become a topic of discussion. Based on these requirements, the main goal of the policy of our country is to provide students with a thorough knowledge and attention to their future independent life. In addition, the authorities of higher education institutions in the country is constantly cooperating with employers on increasing employment rate of graduates.

Of particular importance in the employment of graduates is the gradual introduction of the credit-module system of education in accordance with advanced international educational standards from the 2020/2021 academic year. In this case, five days a week are allocated for the educational process and one day for internships in order to improve the skills and competencies of students in production organizations and enterprises. Graduates are already developing practical skills in their field during their internships, which accelerates the process of their placement and adaptation to future jobs. In recent years, the formation of curricula has focused on the teaching of modern disciplines, based on the needs of consumers, and the extension of internships also serves to strengthen the integration of industry and higher education.

### **Main part.**

The normative and legal framework for youth employment has been created in Uzbekistan. In particular, article 6 of the Law of the Republic of Uzbekistan “On employment of the population” states that one of the main directions of state policy in the field of employment is youth, especially young people in rural areas. Therefore, it is planned to take measures to ensure the employment of graduates of general secondary and secondary special education institutions, vocational schools, vocational colleges, technical schools, higher education institutions.

In accordance with Article 68 of the Labor Code, the state provides additional guarantees to young people who have graduated from secondary special education institutions, as well as privileged graduates of vocational education institutions and universities. According to Article 84, an initial probationary period is not applied when graduates are hired for the first time.

Also, based on the trends in the labor market, district (city) employment centers provide employment services to the unemployed. 46.6% of those who received employment assistance in the last financial year were young people.

Related ministries, organizations and enterprises have entered data on employees into the “Unified National Labor System” (ISHC - interdepartmental software and hardware complex) and formed an electronic database. Today, through this system, information about jobs is published on the sites [www.ish.mehnat.uz](http://www.ish.mehnat.uz) and [www.ish2.mehnat.uz](http://www.ish2.mehnat.uz).

In addition, job fairs are held throughout the country to provide employment for young people. Employers and organizations are participating in these fairs with available vacancies.

In 2021, it is planned to allocate 250 billion soums from the Public Works Fund to attract the unemployed to paid public works.

Measures are being taken to allocate subsidies for the employment of the unemployed and unemployed, especially young people, women, disadvantaged and the needy, which are included in the “Iron Boo”, “Women's Book” and

“Youth Book’. In 2021, it is planned to train 72,000 unemployed people in 40 professions that are in high demand in the labor market.

In order to provide financial support to unemployed citizens, 49.3 thousand unemployed people have received and are being paid 40.3 billion soums of unemployment benefits from loans provided under the World Bank project. As of January 1, 2021, out of 19 million 100 thousand labor resources in the country, 14 million 800 thousand are economically active population. Of these, 13.2 million people have their own jobs, and 1.6 million people need to be employed (more than 805,000 people are unemployed aged 16-30)..

In addition, a total of 560,000 graduates (103 thousand graduates of universities, 438 thousand of secondary schools, 18 thousand of graduates of academic lyceums and professional colleges) will enter the labor market in 2021. As a result, the need for youth employment in 2021 will exceed 1 million 365 thousand people.

134 Bachelor's and 137 Master's degrees have been newly opened in 131 universities in the country. In the concept of development of the higher education system until 2030, it is planned to increase the coverage of youth with higher education to 50% by 2030.

From the above, it is clear that the employment of graduates of educational institutions is becoming more and more important every year. However, at present, the country does not have a system for studying the demand for highly qualified personnel in specific sectors. In addition, in the republic, there are no real-time tracking job vacancies that are highly-paid, no exact information on salaries, fields of work in high demand.

In 2020, 82% of the total employed or 11 million 100 thousand people are employed in the private sector. This means the need to further expand direct cooperation between businesses and higher education institutions in the system of targeted training, defining the real need for personnel.

Employment of graduates studying on the basis of a state grant is carried out by the commission one month before graduation. However, there are no clear targeted measures for the employment of other students, who pay tuition fee.

The requirement for graduates studying on the basis of a state grant to bring a tripartite agreement (student, university, employer) from their future place of work in order to receive a diploma, in many cases only serves to increase the false information in this process.

For example, “Recruitment Centers” at U.S. universities bring together alumni and employers. Students regularly develop skills through the formation of resumes, various trainings and seminars on how to pass the initial interviews. There are also "Recruitment Centers", mainly in technical universities, which attract students for large companies such as Apple, Google, Amazon. Career Centers at Russian universities regularly publish information about vacancies and internships for students in VKontakte, Facebook or Telegram groups. There will

also be lectures, master classes and workshops with the best employers. The centers provide a wide range of opportunities for all students, including those with disabilities.

The main activity of the special employment service in higher education institutions in Finland is to study the demand for specialties in the labor market and to provide vocational guidance to students.

In Japan, recruitment takes place in April each year in the form of a competition. The selected student will take a compulsory short-term training course for up to four weeks and will be thoroughly acquainted with the activities of the organization. In Japan, there is a program called “lifelong employment system”, according to which one person is guaranteed to work in one company for 55-60 years.

Students at the University of Sydney in Australia can participate in real industrial projects, and the Sydney Knowledge Center has partnerships with startups, nonprofits and corporate organizations.

In order to provide employment for graduates in Poland, the government has a “First Job” program, the status of graduates is valid for 12 months from the date of graduation.

In order to provide employment for graduates in Kazakhstan, the program "To the village with a diploma" has been developed. The project will provide additional benefits to graduates studying in the fields of education, health, social security, culture and sports, veterinary medicine.

Another problem in the employment of graduates of higher education institutions is related to the fact that the standard staff units do not meet the requirements of the modern labor market. Therefore, there is a need to analyze the standard staff units of state and government agencies, ministries.

For example, although many people have gained Bachelor’s and Master’s in Social Work (various fields of activity) since 2004, there is no provision of employment of the personnel in this area in the standard staff units of social protection institutions Patronage and Charity Houses, Employment Centers. In particular, as a result of the fact that bachelors and masters of socio-cultural activities are not included in the standard staffing table by the Ministry of Culture, graduates studying in this field are unable to find jobs.

Similarly, political scientists and sociologists, specified in the National Standard Classification of Training of the Republic of Uzbekistan, are not included in the standard staff units of the respective employers. The Ministry of Health operates on the basis of the model staffing table of the former Soviet Union, and the Ministries of Public Education and Preschool Education operate on the basis of the model staffing table of 1996.

The report, published by UNICEF on 11 December 2020, highlights the fact that a significant proportion of young people in Uzbekistan (54.6%) do not study,



do not work and do not receive vocational training after secondary education. Thousands of young people have informally turned their attention to unprotected employment.

### **Results and discussions.**

Despite the fact that the issue of ensuring youth self-employment through the support of entrepreneurship has been identified as a priority in our country, a number of problems remain in the field.

The project “Triggering innovative approaches, entrepreneurial skills and attitudes in HEI learners through creating the favourable conditions for graduate’s employability in Central Asia - TRIGGER” within the framework of the European Union’s Erasmus+ program was launched on January 15, 2021 to study the problems of higher education in the field of employment of graduates and to provide practical assistance for the higher education institutions in Uzbekistan, Kazakhstan and Tajikistan.

TRIGGER project focuses on three Central Asia countries (Kazakhstan, Tajikistan and Uzbekistan) which undertook significant changes in the past decade. Even the substantial differences between Central Asia countries exist, the serious challenges remain, particularly in implementing deeper institutional and systemic reforms that are critical to strengthening the foundations of economic freedom.

TRIGGER project, which gets 5 European and 11 Central Asian institutions together, is aimed to “strengthening of relations between HEIs and the wider economic and social environment”. TRIGGER is multi-country projects within one single region –Central Asia, involving three countries (Kazakhstan; Uzbekistan; Tajikistan) from this region. TRIGGER project refers to regional priority for Central Asia countries (Region 7): “Developing the higher education sector within society at large”: University-Enterprise cooperation, particular TRIGGER supports student practical placements, entrepreneurship, employability of graduates. Uzbekistan and Kazakhstan listed this regional priority also under national priorities. Tajikistan listed governance, strategic planning and management of HEI, which are partially covered by TRIGGER project as the condition for successful implementation of favorable conditions for better employability of graduates in Central Asia countries requires also improvement of strategic planning at HEI level. The EC innovative tools HEInnovate and EntreComp will be used.

TRIGGER also focuses on the university-business cooperation. In a considerable part of the world, including Central Asia, HEIs are still seen as the bastion of basic research and academic values and not as the engines for innovation, growth and employability. Further globalization and the corresponding need to respond to broader knowledge demands from society and the economy are bound to change this. European experience with this change process is a valuable asset in TRIGGER. Given recent socioeconomic

developments, closer cooperation in both directions between the worlds of work and learning is inevitable. The lack of contact between HEIs and businesses is felt most strongly in teaching and research. Cooperation with industry for innovation and with employers for work requires HEIs to take a fresh look at relevant academic disciplines and of the mutual benefits entailed. There are clear benefits to closer cooperation for both HEIs and their stakeholders in society. The active involvement of nonacademic partners in curriculum development and performance evaluation enhances the innovation potential of HEIs and the employability of their graduates. TRIGGER is focusing on this area but not exclusively only on cooperation with industry. Opening up HEIs to civil society and to society at large also has strong potential for change. There is much to be gained for students and society by forging links with local NGOs, trade associations and local authorities where possible.

In order to improve communication between academics and entrepreneurs, and between HEIs and enterprises, TRIGGER brings the training on proper way of communication, usage of suitable communication techniques, carrying out needs analyses on issues related to entrepreneurship, organizing events with partners outside of HEI environment and integrating special kind of internships based on ENTER.M into study programs. Transferrable skills and soft sciences will be encouraged to become a part of science and engineering curricula, so that these graduates are better adapted to labor market needs. A favorable legal, administrative and financial environment is needed, in which HEIs can conclude comprehensive agreements and contracts with industry, provide incentives to their staff, as well as to representatives of enterprises, and establish and operate dedicated structures. The support from national authorities is required to do this that is why they are involved as associated partners in high extend. TRIGGER will be focused on enhancing the value of learning, research and innovation for society. The TRIGGER partners will learn how tracking of the graduates is needed for the employability of students and career trajectories, to provide evidence on which to react. They can be supplemented with the establishment/enhancement of work with alumni for monitoring longer-term outcomes and ensuring peer support. TRIGGER also ensures the sustainability of project results by establishing operational structures that sustain industry-HEI cooperation.

Main aim of TRIGGER project is: to contribute to economics growth through creating the favorable conditions for better employability of graduates in Central Asia countries. The main aim will be reached through 4 specific objectives fulfilment as follows:

1. to support HEI preparedness for future challenges especially related to the entrepreneurial and innovative nature of their higher education environment;
2. to enhance Entrepreneurship Education and Skills Development at partner country HEIs;

3. to establish/enhance the Careers, Employability and Enterprise Services at partner country HEIs;

4. to strength the relations between HEIs and the wider economic and social environment.

The list of TRIGGER partners:

1. Technical University of Kosice, Slovakia
2. L.N. Gumilyov Eurasian National University, Kazakhstan
3. Atyrau State University, Kazakhstan
4. Toraighyrov University, Kazakhstan
5. Termez State University, Uzbekistan
6. Namangan Institute of Engineering and Technology, Uzbekistan
7. Jizzakh Polytechnic Institute, Uzbekistan
8. Tashkent State Transport University, Uzbekistan
9. Dangara State University, Tajikistan
10. Branch of Lomonosov Moscow State University in Dushanbe, Tajikistan
11. Khorog State University named M. Nazarshoev, Tajikistan
12. Kulob State University, Tajikistan
13. University of Applied Sciences BFI Vienna, Austria
14. Universite Cote d Azur, France
15. ASTRA, Slovakia
16. IDEC, Greece

Termez State University is considered to be the leader for the WP5 referring to Dissemination, Exploitation and Sustainability of the project.

The target groups of TRIGGER projects are as follows:

The primary target audiences:

- a. HEI teachers, researchers, lecturers;
- b. HEI administrators, technicians, librarians;
- c. Developers of standards, programs, curricula, etc.;
- d. Training providers;
- e. Decision-makers and managers in HEI institutions;
- f. Representatives of employers, employer's organizations and networks;
- g. Relevant businesses and R&D institutions, other universities;
- h. HEI students and graduates.

The secondary target audiences:

- a. Decision-makers on regional/national level especially in economics, labor, employment & education policy;
- b. Policy makers at the national, regional and community level;
- c. Representatives of regional and local authorities;
- d. Representatives of non-profit sectors dealing with employment and training;

f. Regional development support organization (e.g. regional development agencies, innovation centers);

g. business support organizations at the regional level (e.g. business innovation centers, regional information, and consultancy centers).

Under the TRIGGER project all Central Asian universities conducted surveys, using the EC innovative tools HEInnovate, on HEI preparedness for future challenges, on entrepreneurship education at each partner university and gaps between labour market future skills requirement and entrepreneurship education provision, potential knowledge and skills mismatches, on graduates employability within the WP1, WP2 and WP3 of the project. Coming out of the results, the universities were given a chance to identify weak points on the above mentioned areas, and to work on them.

### **Conclusions and suggestions.**

Taking into account the above, based on the analysis of the work done under the project as well as the work carried out in Uzbekistan in the field of employment of graduates, the following conclusions and recommendations can be made:

1. Taking into account the requirements of employers, modern labor market and industries in the development of curricula for areas of study and specialties;

2. Introduction of special courses on entrepreneurial skills and financial literacy in general secondary, vocational and higher education institutions;

3. To create sufficient conditions for internships for students in enterprises and organizations, and to establish the practice of reaching employment contracts during the future internships;

4. Establishment of services, such as “legal advice”, “business incubators” for young entrepreneurs and simplification of the process of obtaining a loan;

5. To study the modernity of electronic resources that track real-time specialties in high demand and provide exact information on vacancies and average wages available in the labor market

In conclusion, we believe that the TRIGGER project will make an invaluable contribution to the employment of university graduates in line with the state policy in the field of youth employment in Uzbekistan.

### **References:**

1. Resolution of the Senate of the Oliy Majlis of the Republic of Uzbekistan No. SQ-311-IV of May 29, 2021.

2. <https://mehnat.uz/uz> - Website of the Republic of Uzbekistan on employment and labor relations.

3. <https://lex.uz/> - Portal of the legislation of Uzbekistan.

4. <https://stat.uz/uz/> - Website of the State Statistics Committee of the Republic of Uzbekistan.

# **“БИОЭКОНОМИКА” В УЗБЕКИСТАНЕ: ПЕРСПЕКТИВЫ РАЗВИТИЯ И МЕЖДУНАРОДНОЕ СОТРУДНИЧЕСТВО В СФЕРЕ ПОДГОТОВКИ КАДРОВ ДЛЯ ПЕРСПЕКТИВНЫХ ОТРАСЛЕЙ НАРОДНОГО ХОЗЯЙСТВА**

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**Аннотация.** Мақолада Бухоро давлат университетида “BioEcUZ: Инновацион био-ресурс иктисодиёти бўйича янги магистерлик дастури” лойиҳаси доирасида амалга оширилаётган ишлар ва режалаштирилган натижалар ҳақида маълумот берилган.

Основными предпосылками развития биоэкономики учеными признаются следующие факторы: уменьшающийся объём полезных ископаемых, минеральных, сырьевых и энергетических ресурсов, загрязнение окружающей среды и экологический вред, нехватка продовольствия из-за роста численности населения в мире, стремительное развитие науки и технологий, что способствует привлечению всё больше ресурсов в процессе производства ради удовлетворения растущего спроса населения планеты на товары и услуги. В настоящее время большинство ученых экономистов полагают, что пятым (и основным!) фактором экономического роста и развития современных государств является знаниевый фактор. И только те страны, которые активно используют новые знания, то есть являются знаниеёмкими, к 2030-2050 году смогут стать экономически развитыми.

Ныне, наряду с выпуском промышленно добываемых ресурсов, появилась объективная необходимость использовать ограниченные природные ресурсы в обществе (прежде всего, биологические) на возобновляемой и экономически обоснованной основе, что в свою очередь повлияло образованию новой сферы науки - биоэкономики. В настоящее время формирование биоэкономики становится приоритетным и стратегическим направлением государственного развития во многих странах мира, где созданы специальные программы поддержки этого нового направления и проводится целенаправленная государственная политика.

Среди стран Европейского Союза в области развития биоэкономики одну из ведущих ролей занимает Финляндия, где главным источником биомассы являются леса. Стратегия биоэкономики в Финляндии направлена на повышение производства в секторах биоэкономики от нынешних 64 миллиардов евро до 100 миллиардов евро к 2025 году. В ходе этого процесса будут созданы 100 000 новых рабочих мест и дано второе дыхание национальной экономике. Потенциал огромный: в Европе биоэкономика уже приносит более двух триллионов евро ежегодно, и продолжает быстро

расти. Но для обеспечения успеха в длительной перспективе нужно сделать еще много, в частности, готовить новых ученых и поощрять новые компании.

А, по проведенному предварительному анализу секторов биоэкономики в Узбекистане проведенным консорциумом проекта (полный анализ (на английском языке) доступен: <http://bioecuz.tdau.uz/results>), было установлено, что Узбекистан находится на стадии формирования и развития национальной политики по биоэкономики, но в то же время Узбекистан имеет огромный потенциал для ускоренного роста биоэкономики. Постепенно уделяется больше внимание и средства по улучшению экологии, безопасности продуктов питания и расширению использования возобновляемых ресурсов в стране. Следует отметить, что население Узбекистана за период 2001-2021 года выросло на 36,5 %. Относительно быстрый рост населения страны требует расширения рынка товаров и услуг соответствующим образом, что приводит к увеличению спроса на сырьевые ресурсы.

В Узбекистане концентрирован разнообразный и богатый растительный и животный мир, огромный, потенциал солнечной и ветровой энергии, а также развито сельское хозяйство и .... подготовка кадров в сфере сельского хозяйства, биохимии и биотехнологии. Так же в настоящее время имеются большие возможности по использованию вторичных ресурсов. В данном аспекте в стране делаются первые шаги вперед. Так, в Узбекистане за год накапливаются 7.1 млн. т бытовых отходов. В 2018 году в результате переработки 1.3 млн. тонн таких отходов произведены около 1.1 млн. тонн товаров. Из представленных данных видно, что ежегодный объем не переработанных бытовых отходов составляет 5,8 млн. тонн. Дальнейшая организация их глубокой переработки, наряду с ростом объемов производства товаров, служит предпосылкой для создания новых рабочих мест и для улучшения окружающей среды. Решению данной задачи в Узбекистане уделяют особое внимание: развитие инфраструктуры санитарной очистки, направленное на обеспечение полного охвата населения услугами по сбору и вывозу твердых бытовых отходов; создание эффективной и современной системы переработки твердых бытовых отходов; сокращение объемов твердых бытовых отходов, направляемых для захоронения на полигоны, создание современных полигонов твердых бытовых отходов, соответствующих требованиям санитарных и экологических норм, а также принятие мер по закрытию и рекультивации существующих полигонов; совершенствование ценообразования и оптимизация тарифов в сфере санитарной очистки; использование объектов твердых бытовых отходов в виде источников альтернативной энергии.

Для реализации этих задач в регионах разрабатываются инновационные проекты по переработки бытовых отходов. Однако, для комплексного, рационального и эффективного использования бытовых отходов и вообще биоэкономического потенциала страны в перспективе



наряду с применением современных инновационных технологий играет большую роль изучения передового опыта зарубежных стран в сфере производства, научных исследований и подготовки кадров в отраслях биоэкономики. В данном аспекте международное сотрудничество научно-исследовательских и образовательных учреждений нашей страны тоже имеет весомое значение. В целом, симбиоз биологии и экономики не ограничивается только их взаимопроникновением, поскольку в этот процесс активно включаются и другие науки, тесное взаимодействие которых привело не только к зарождению биоэкономики, но так же способствует интенсивному расширению и углублению теоретических знаний в различных областях биоэкономики; диверсификации направлений развития реальных секторов, в которой создаются новые области практической деятельности, создающие новые профессии и специальности в сфере биоэкономики.

Реализация проекта «Новая магистерская программа для устойчивого развития биоэкономики в Узбекистане» (BioEcUz) при участии восьми партнёров: Латвийский университет естественных наук и технологий (Латвия), Университет Витовта Великого (Литва), Университет прикладных наук Ювяскюля (Финляндия), Ташкентский государственный аграрный университет и Самаркандский филиал данного университета, Ташкентский институт инженеров ирригации и механизации сельского хозяйства, Бухарский государственный университет и Министерство сельского хозяйства Республики Узбекистан станет одним из более масштабных мероприятий в сфере развития биоэкономики. Проект внедряется с финансовой поддержкой программы «Эрасмус+» Европейского Союза.

В результате проекта будет создана основа для продолжения обучения по биоэкономике и дальнейшего развития нового направления, а именно будет:

- разработана и внедрена новая, инновационная магистерская учебная программа по биоэкономике;
- повышен уровень компетенций и навыков преподавательского состава в четырёх ВУЗах Узбекистана;
- повышен инновационный потенциал участвующих вузов Узбекистана;
- созданы условия для дальнейшего сотрудничества между университетами Узбекистана и Европейского союза.

Для достижения намеченных целей весной 2021 года был проведён углублённый анализ, чтобы осознать и понять факторы, способствующие или затрудняющие развитию биоэкономики в Узбекистане. Анализ включает: а) оценку участвующих высших учебных заведений и краткий обзор других ВУЗов Узбекистана, которые предоставляют образование в секторах биоэкономики, б) анализ смежных отраслей народного хозяйства в Узбекистане и краткий обзор по Центральной Азии; в) анализ государственного сектора в Узбекистане, включая государственные органы ответственные/занимающиеся секторами биоэкономики, ответственные за

разработку, принятие и мониторинг национальных стратегий, политики и планов развития, связанных с областью биоэкономики.

Следует отметить, что в проведённом анализе наряду с определением базовой основы биоэкономики по отношению трёх основных заинтересованных сторон: университеты, бизнес и государственный сектор, так же была определена роль каждого вовлечённого ВУЗа Узбекистана.

Исходя из анализа и договорённостей достигнутых во время многократных встреч партнёров были определены основные направления новой магистерской программы. Новая учебная программа будет включать знания обширные знания в разных направлениях. Например, таких, как:

- поощрение развитию растениеводства, животноводства и аквакультуры на основе внедрения новых технологий, развития селекции и семеноводства, повышении плодородности почвы и продуктивности животных;
- эффективное использование биомассы, а также развитие переработки био-отходов;
- производство и использование альтернативных видов энергии;
- расширение производства и экспорта продукции, произведённой из обновляемых природных ресурсов;
- за счет создания новых мощностей поощрение ускоренного роста новых производственных направлений, мощностей и другие.

Подробная информация о реализации данного проекта размещена на разработанном веб-сайте <http://bioecuz.tdau.uz/>.



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## **HARMONE - ГАРМОНИЗАЦИЯ И ВЗАИМНОЕ ПРИЗНАНИЕ ПРОГРАММ МАГИСТРАТУРЫ В ОБЛАСТИ ГИГИЕНЫ ТРУДА И ОКРУЖАЮЩЕЙ СРЕДЫ**

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**Аннотация.** Авторами проанализировано пути реализации проекта HARMONE - который приведет к совершенствованию знаний и практики в области общественного здравоохранения, достижению устойчивых

результатов, удовлетворению текущих потребностей, и заполнение пробелов в странах Центральной Азии.

**Annotatsiya.** Mualliflar tomonidan HARMONE loyihasini amalga oshirish yo‘llarini tahlil qilindi – bu aholi salomatligi sohasida bilim va amaliyotni takomillashtirish orqali barqaror natijalarga erishish, hozirgi ehtiyojlarni qondirish evaizga Markaziy Osiyo mamlakatlaridagi bo‘shliqlarni to‘ldirishga olib keladi.

**Abstract.** The authors analyzed the ways of implementing the HARMONE project - which will lead to improving knowledge and practice in the field of public health, achieving sustainable results, meeting current needs, and filling gaps in the countries of Central Asia.

*Ключевые слова: эпидемиология, магистратура, окружающая среда*

Противодействие экологическим угрозам, эндемичным для Центральной Азии, имеет ключевое значение. Поэтому необходимо наращивать потенциал в области экспертизы окружающей среды. Консорциум HARMONE состоит из 9 высших учебных заведений Центральной Азии (CA HEIs) в четырех разных странах и двух европейских университетов.

Глобальные тенденции, такие как изменение климата, рост населения, урбанизация, вырубка лесов, увеличение спроса на продовольствие и значительный рост международной торговли и путешествий, создают серьезные проблемы для общества в целом, включая серьезные риски для здоровья людей, животных и экосистем.

Адекватное решение этих глобальных проблем должно включать разработку и осуществление долгосрочных мероприятий, которые исходят из комплексной и сбалансированной перспективы, в которой интегрированы элементы и соображения, касающиеся человека, ветеринарии, дикой природы и окружающей среды. Другими словами, оптимальное глобальное здоровье должно быть достигнуто за счет использования целостного подхода.

Это решительно подтверждается Целями в области устойчивого развития, которые являются настоящим призывом к действиям всех стран - развитых и развивающихся - в рамках глобального партнерства.

Они признают, что ликвидация нищеты и других лишений должна идти рука об руку со стратегиями, направленными на улучшение здравоохранения и образования, сокращение неравенства и стимулирование экономического роста.

С более классической точки зрения, основное внимание в рамках One Health уделяется передаче инфекционных заболеваний на стыке человека, животных и окружающей среды.

Здоровье окружающей среды затрагивает все физические, химические и биологические факторы, внешние по отношению к человеку. Она охватывает оценку и контроль тех экологических факторов, которые потенциально могут повлиять на здоровье, включая жилье, рабочую среду, городское развитие, землепользование и транспорт. Она направлена на профилактику заболеваний и создание благоприятных для здоровья условий, способствующих позитивному вкладу в общественное здравоохранение. Для ясности, в остальной части предложения мы будем использовать общий термин "Общественное здравоохранение" для обозначения рассмотренных выше вопросов. Для эффективного применения интегративного подхода необходимо поощрять междисциплинарные исследования и образование, в которых региональные проблемы могут потребовать особого внимания в рамках этой обширной структуры.

Проблемы охраны окружающей среды в Центральной Азии вызывают серьезную озабоченность. Странам приходится справляться со сравнительно более сильным воздействием изменения климата на здоровье в Центральной и Восточной Европе, загрязнением окружающей среды в результате удаления токсичных отходов и загрязнения воздуха, химическими отходами от добычи полезных ископаемых (золото, ртуть, свинец, сурьма, асбест, уран). Ядерные отходы все еще присутствуют в результате испытаний ядерного оружия в период бывшего Советского Союза и в результате захоронения ядерных отходов из Западной Европы.

Кроме того, важной проблемой является загрязнение воздуха промышленностью, процессами отопления, автомобильными выбросами и открытым сжиганием твердых отходов. Эти загрязнения окружающей среды со многими токсичными горячими точками влияют на здоровье людей, живущих по соседству с загрязненными участками. Таким образом, проблемы гигиены труда имеют решающее значение в Центральной Азии, одни и те же загрязнители также влияют на здоровье работников, занятых в горнодобывающей промышленности и участвующих в очистке и контроле загрязненных территорий. Недавнее внедрение вторичной переработки создает новые проблемы в области охраны труда. Кроме того, зоонозы, такие как бруцеллез и эхинококкоз, среди фермеров устойчиво распространены во всех 4 странах ЦА. Имеется заниженная информация о профессиональных заболеваниях и смертях. Местный опыт в этих областях недостаточен, отчеты часто противоречивы.

Нехватка ресурсов и опыта препятствует развитию систематического и надлежащего образования магистров в области общественного здравоохранения. Это имеет важное значение для соответствующих программ эпиднадзора и консультаций по решению этих проблем. Разработка новых модулей для программ магистратуры должна основываться на - Международное сотрудничество; - Подход "Учи учителя" для обеспечения устойчивого образовательного результата в регионе; - Укрепление таких дисциплин, как экологическая эпидемиология,

токсикология, инфекционные заболевания, науки о воздействии, гигиена труда, оценка рисков; - Исследование междисциплинарности; - Навыки как междисциплинарного, так и смешанного обучения.

**Целью проекта** является совершенствование знаний и практики в области общественного здравоохранения, с использованием подхода "Учи учителя" для достижения устойчивых результатов в соответствии с текущими потребностями и пробелами в странах Центральной Азии.

Конкретные цели проекта будут соответствовать основным задачам, которые заключаются в нижеследующим:

1. Разработка новых модулей для укрепления дисциплинарных навыков, необходимых в области общественного здравоохранения.

2. Нарращивание местного потенциала путем подготовки преподавателей по вопросам разработки и проведения магистерского образования (MSc) в области общественного здравоохранения.

3. Повышение уровня образовательных и исследовательских компетенций и навыков в участвующих вузах в областях, связанных с общественным здравоохранением.

4. Укрепление и расширение существующей региональной и международной сети в области просвещения в области общественного здравоохранения.

5. Внедрение междисциплинарного подхода в просвещение в области общественного здравоохранения.

Программа разделена на следующие этапы:

I. Этап согласования; II. Обучение; III. Разработка модулей MSc в области общественного здравоохранения; IV. Поставка новых модулей MSc; V. Деятельность по распространению информации;

#### **Результаты и обсуждение:**

Был проведен SWOT-анализ который дал возможность создания модулей MSc в области общественного здравоохранения, соответствующих стандартам ЕС и учитывающих местные особенности.

Результаты инвентаризации двух предыдущих проектов определили академическое содержание учебной программы летних школ. Участники на основе анализа учителя будут обучены нескольким дисциплинарным навыкам, включая экологическую эпидемиологию, токсикологию, (зоонозные) инфекционные заболевания, науки о воздействии, гигиену труда, оценку рисков с использованием обширного онлайн-подготовительного модуля и 2 раза по 2-недельному курсу в классной комнате с промежутком в один год.

Рассмотрены междисциплинарные навыки, такие как сотрудничество на основе дисциплинарного обоснования, принятие перспектив, общая

основа и интеграция, что позволило учителям развивать более широкий кругозор и иметь возможность соединять различные дисциплины и области. Кроме этого учителя были ознакомлены и оснащены в разработке контента для образовательных модулей, инновационных методов обучения, смешанного обучения, разработке учебных материалов и подготовке студентов и других преподавателей.

В связи распространением новой коронавирусной инфекции вовлеченный за собой пандемию COVID-19 программа летней школы 2021 года было перенесено на онлайн формат. Первые онлайн уроки были организованы в ноябре 2021 года профессором Dario Consonni на тему Общие понятие эпидемиологии. Все материалы были загружены в облачную пространство что позволили всем участникам воспользоваться информацией в любое время суток.

После первой летней школы учителя в течение года будут работать над собственными проектами под наблюдением специалистов ЕС. Они будут выполнять индивидуальный исследовательский проект по теме, представляющей интерес для их страны происхождения, что позволит учителям более широко обучать этим (междисциплинарным) навыкам и применять их в теме, соответствующей местным потребностям.

Во второй летней школе будут представлены индивидуальные исследовательские проекты и разработанные модули MSc. После этой летней школы смешанные модули MSc могут быть доработаны и распространены в дальнейшем. Обученные тренеры будут делиться новыми знаниями и обновленными научными навыками со своими коллегами в университетах ПК и со студентами, подготавливая дидактические материалы (брошюры, буклеты и книги). Для бюджетной эффективности оборудование будет выбрано таким образом, чтобы его можно было использовать более чем в одной дисциплине общественного здравоохранения, что гарантирует улучшение модулей, связанных с общественным здравоохранением, в будущем. Предпочтительным будет оборудование, которое может быть использовано в практическом преподавании различных дисциплин общественного здравоохранения, например, для определения устойчивости микроорганизмов к антибиотикам или качества продуктов питания и воды.

После проведение обучающего этапа перейдут к разработке модулей MSc в области общественного здравоохранения. Преподаватели будут разрабатывать модули MSc в 7 командах, состоящих из 4 участников из каждой страны Центральной Азии (ЦА). В конце концов, все модули MSC, охватывающие несколько дисциплин должны быть внедрены в каждой стране ЦА.

В следующем этапе партнеры ПК начинают объявлять модули, открытые для 10 студентов каждый, отобранных с использованием объективных и прозрачных критериев. Во 2-й половине проекта в каждом



университете будут организованы международные семинары с приглашенными преподавателями из университетов ЕС и ЦА.

В Заключительном этапе программы обученные тренеры поделятся своими знаниями и навыками с помощью платформы Moodle. Все материалы проекта будут размещены на веб-сайте. В период реализации проекта будут организованы публичные мероприятия, в рамках которых будет продолжено сотрудничество с местными и национальными органами власти (НПО, министерствами образования/здравоохранения/окружающей среды, компаниями).

**Заключение:** реализация проекта HARMONEE - который подразумевает гармонизацию и взаимное признание программ магистратуры в области гигиены труда и окружающей среды приведет к совершенствованию знаний и практики в области общественного здравоохранения, достижению устойчивых результатов, удовлетворению текущих потребностей, и заполнение пробелов в странах Центральной Азии.

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