Erasmus+

Cooperation for innovation and the exchange of good practices sub-programme

TECHNICAL REPORT form

Programme	Erasmus+
Sub-Programme	Cooperation for innovation and the exchange of good practices
Action	Capacity Building in higher education
Sub-Action	Joint Projects
Call for Proposal	EAC-A03-2018
Project number	609757-EPP-1-2019-1-RS-EPPKA2-CBHE-JP
Agreement/decision number	20192108
Project Title	Dual Education for Industrial Automatization and Robotics in Kazakhstan

Contractual Data

Dates and Beneficiaries

Dates

Project Start:	15/01/2020	Project End:	14/01/2023
Activities Start:		Activities End:	
Project Duration(months):	36		

Beneficiary Data

Role	PIC	Name	Country
Coordinating Organization / Beneficiary	998833833	UNIVERZITET U NOVOM SADU	Serbia
Management Contact Person	998833833	UNIVERZITET U NOVOM SADU	Serbia
Co-Beneficiary / Partner	895470342	URALSK TRANSFORMER PLANT	Kazakhstan
Co-Beneficiary / Partner	902775218	SARYARKAAVTOPROM LIMITED LIABILITY PARTNERSHIP	Kazakhstan
Co-Beneficiary / Partner	938826820	WEST KAZAKHSTAN AGRARIAN TECHNICALUNIVERSITY AFTER ZHANGIR KHAN	Kazakhstan
Co-Beneficiary / Partner	941874851	INNOVATIVE UNIVERSITY OF EURASIA	Kazakhstan
Co-Beneficiary / Partner	942757454	KOSTANAY ENGINEERING AND ECONOMICS UNIVERSITY NAMED AFTER M. DULATOV	Kazakhstan
Co-Beneficiary / Partner	999489456	FH JOANNEUM GESELLSCHAFT MBH	Austria
Co-Beneficiary / Partner	967038494	DUALE HOCHSCHULE BADEN-WURTTEMBERG	Germany

Legal Representative

Organisation Legal Address

Name:	UNIVERZITET U NOVOM SADU		
Street:	DR ZORANA DINDICA 1		
Post Code:	21000	City:	NOVI SAD
Country:	Serbia		

Department

Name:	Faculty of Economics		
Street:	DR ZORANA DINDICA 1		
Post Code:	21000	City:	NOVI SAD
Country:	Serbia		
Local Address:			
Internet site:	http://www.uns.ac.rs		

Contact

Title:	PhD	Function:	Rector
Name	Dejan	Last Name:	Jaksic
Phone Number 1:	+381 21 485 2020	Phone Number 2:	
Fax Number:	+381 21 450 418	Mobile Number:	
Email:	rektor@uns.ac.rs		

Contact Person

Organisation Legal Address

Name:	UNIVERZITET U NOVOM SADU		
Street:	DR ZORANA DINDICA 1		
Post Code:	21000	City:	NOVI SAD
Country:	Serbia		

Department

Name:	Faculty of Economics		
Street:	DR ZORANA DINDICA 1		
Post Code:	21000	City:	NOVI SAD
Country:	Serbia		
Local Address:			
Internet site:	http://www.uns.ac.rs		

Contact

Title:	PhD	Function:	Full professor
Name:	Mirko	Last Name:	Savic
Phone Number 1:	+38124628000	Phone Number 2:	+381641183528
Fax Number:		Mobile Number:	

Email: savicmirko@ef.uns.ac.rs

Project Summary and Horizontal Issues

Project Description

English - 1	The aim is to develop, implement, test and validate the undergraduate program in the field of industry automatization and robotics with implemented dual education (DE), at three HEIs in Kazakhstan. The project will develop necessary documentation, from syllabus to teaching materials, practical training of academic staff and integration of tutors from industry into educational process. The project will also provide the possibility of training professionals in the IAR (LLL). The aim is to create more universal educational trajectories through DE, and better connection between HE and companies. The result will be a better-quality training of specialists capable of integrating into the activities of an enterprise without an adaptation period. Specific objectives: 1) Promote the development and adjustment of curricula in accordance with the needs of industrial companies in the educational process of DE technology. 2) Involve professionals from the industry in defining the specific training needs and elaborate the content for the periodical practical trainings within the dual technology of learning. 3) Transfer and implement the best practices from EU countries that have long-term experience in dual HE programs by creating capacity for delivery of periodical practical trainings by academic and company staff. 4) Create tools and templates to facilitate the phased implementation of practical training in enterprises. 5) Demonstrate the benefits of DE technology of HE for all involved stakeholders by piloting and evaluation of the adapted curricula, necessary tools and training materials. 6) Develop methodology for modification and realignment of existing undergraduate curricula in Science & Technology for implementation in practice-integrated dual paradigm. 7) Ensure continuous exploitation of results by proposing a DE technology to other HEIs and enterprises. 8) Disseminate results in English, Kazakh and Russian and stimulate the creation of more dual HE programs.

Horizontal Issues

Previous recommendations/follow-up

A preventive monitoring visit to project has taken place in February 2020 at Kostanay Engineering and Economics University. It was carried out by the National Erasmus+ Office Kazakhstan. Overall comments: "The start of the project is promising and the composition of the consortium inspires optimism. The teams at each university still need to be complemented to cover the aspects of QA, sustainability, collaboration with enterprises and redistribute the tasks among the present members. But overall, the team is institutionalized and involves as core group of qualified specialists competent in the area the project is addressing. The main activities have not yet started, but there are no delays in project progression. The consortium has a well-thought QA strategy. There is also a potentially good synergy with other completed and ongoing projects. Partnership and cooperation between the Kazakh partners and with EU partners are well established."
The recommendations:
"1)The team should focus more on the collaboration with companies in terms of their willingness and readiness to invest in human and financial resources in job-place training in higher education.
2)The team should not take the involvement of enterprises as granted. It is recommended to have a realistic plan on involving enterprises in introducing dual study and promoting acceptance of the concept of dual study in higher education by relevant companies.
3)The sustainability strategy and plan should be developed and their implementation should start as early as possible.
4)The composition of the teams at each university should be complemented (if need be) to take care of specific areas (sustainability, collaboration with enterprises, QA, etc.).
5)Attention should be paid to enhancing English skills in the team to ensure that the programmes will be delivered in three languages (as planned)."
The following measures were taken in line with the recommendations of NEO:
1)The team focused more on the collaboration with companies through series of meetings with their representatives at three Kazakhstan universities in order to motivate companies to invest in dual education in higher education. So far, beside regular meetings of consortium, there was several meetings with companies, mostly face-to-face.
2)The involvement of companies in dual education is significant, especially when it comes to development of curriculum, where special meetings were organized to present the draft curriculum and to discuss it with representatives of enterprises.
3)Consortium is focused on development of IAR study program and LLL courses at Kazakhstan universities on a long-term basis. Third year of the project will be dedicated to provision of sustainability of project results. Developed training materials and methodological guidelines will contribute to the sustainability of the project. The support of decision makers and employers ensures the sustainability of project results in the future.
4)Through development of joint program at three universities, we have combined the human potential of the institutions in order to obtain complementarity in various specific areas related to project activities and study program.
5)According to the project proposal, the study program will be conducted in local languages, and there is no problem when it comes to use of Kazakh and Russian. Anyway, it is important to increase the level of English language of teaching staff in Kazakhstan, providing the possibility to organize some lectures in English. In the second half of the project, the consortium will assess the level of language skills. Besides language training, one of the solutions is to combine the teaching staff at the joint study program providing teachers with good language skills at all three universities.

Transversal issues

The project addresses several transversal and cross-cutting issues relevant for the EU and its partner countries: unemployment and gender balance.
DIARKAZ project is motivated by needs for professionals in the field of industry automatization and robotics in many branches of Kazakhstan economy. This need is justified by several national strategic documents.
The project is motivated by need for professionals in the field of IAR in many branches of Kazakhstan economy, expressed in all national strategic documents, stressing the shortage of highly skilled professionals in the economy. The main document that sets the direction of the labour market is the Development Strategy "Kazakhstan - 2050", which defines the key benchmarks of the modern education system, training and retraining of personnel based on an analysis of the lack of highly qualified specialists in the economy. Program "Digital Kazakhstan" emphasizes that new time dictates a new system of knowledge transfer. The educational process should be technological, and it is necessary to move away from a purely verbal-reproductive approach to learning, obtaining information comes from a variety of sources. Therefore, accent should be on investment into education and training to face the challenges of fast changing labour market.
In order to develop professionals with right competences, during first half of the project we have organized several meetings with companies from the field of industry automatization and robotics. Through survey and intensive dialogue, we have discovered what kind of experts they need. Every partner university in Kazakhstan organized a several meetings with companies in order to collect information about their attitudes and goals regarding industry automatization and robotics and competences of experts in that field. The representative of companies were involved into development of curriculum in IAR at all three universities. More information on the following links: http://diarkaz.kineuprojects.kz/project-outcomes/ (deliverables 1.1.4, 1.2.1, 1.2.2, 1.2.3).
Ultimately, therefore, this project will result in increase of employment of IAR graduates on labour market in the country and Central Asia region. Dedication of Kazakhstan partner university institutions to develop newly designed dual studies will contribute to the achievement of the project final goals:
• Improvement of the competencies of higher education graduates in Kazakhstan according to the needs of employers,
• Increase of the employability of graduates and their motivation to study, and
• Improvement of accessibility to higher education of students from lower income families
Second issue is related to gender balance. Position of women is unfavourable when it comes to their employment in the industry automatization and robotics sector as a whole. Having that in mind, DIARKAZ consortium is trying to improve the position of women through continuous dialogue with stakeholders and promotion of gender balance in IAR sector.

Involvement of people with fewer opportunities

In order to support and promote the interests of students with special educational needs, all three Kazakhstani universities are implementing an inclusive education policy aimed at increasing the level of accessibility and involvement of all students in the educational process by identifying and eliminating possible obstacles.
The universities have created conditions for providing an educational environment with the use of special educational materials, technical training tools necessary for the development of educational programs by students with special educational needs, material and technical conditions for unhindered access and stay in educational buildings, classrooms and premises for persons with physical disabilities.
The main conditions for the implementation of inclusive education in relation to students with special educational needs are:
•Individual approach to each student;
•Reducing the adaptation period for students;
•Integration of students into the academic environment of the university;
•Providing consulting, psychological support to students with special educational needs in matters of the educational process and youth policy, research activities;
•Formation of an individual learning path for students with special educational needs;
•Accompanying and support throughout the training, including departments, faculties, registrar's office and other divisions;
•Appointment of inclusive education coordinators when a student notifies about special educational needs in writing;
•Training of teaching staff and employees to work with students with special educational needs.

Award Criteria

Assessment Criteria

Relevance of the project

Relevance to the objectives

The overarching aim for our joint project DIARKAZ is to supplement and support the Higher Education System of Kazakhstan by establishing structures and contents for undergraduate study programmes according to the needs of companies in the field of Industry Automatization and Robotics (IAR). One of the core concepts is the co-operation between the corporate sector and academia for Dual Higher Education (DHE). However, there are several further stakeholders involved, who are important for the development of a sustainable dual study program, e.g. Chambers of Commerce, Industry associations or reliable suppliers of equipment.
It is obvious that the development and establishment of a dual framework in HE will provide for advancement of human potential by implementing future oriented teaching and learning methodologies according to the rapid development in the IAR industry. Kazakhstan's formal State Planning System 'Kazakhstan 2050' provides a strong basis to guide the country's socioeconomic development over the medium- and long-term. The short-term increase of the GNP is predicted with 3.2% (2021), 4.0 %(2022) and 4.8 %(2023) (GTAI 2021). Altogether, this indicates the demand for highly qualified professionals in economically relevant industries, which can be met by establishing tailored dual study program. We aim for enabling young people to enter a learning process at the interface of theory and practise, which will lead to a viable degree within a short study period.
As the Kazakh government adapted their policy (2020-2025) to reform VET, allow for flexible curricula, rise permeability into HE and acknowledge an 'Applied Bachelor' degree, the DIARKAZ project seems to proceed in a well-oriented direction (ETF 2021). However, the 'Applied Bachelor' degree still needs alignment with the EQF, which is the long-range aim of the Kazakh Education Ministry. Our project of course strongly supports this aim.
To achieve the standardisation of degrees in dual HE, the integral approach of the DIARKAZ project focuses on 'Modernisation of curriculum by developing new and innovative courses and methodologies' in the field of IAR. Our transfer and adaption is based on up-to-date methodologies of teaching and learning, adequate pedagogical approaches and ICT-based practises as well as on defining learning outcomes, which support employability, and lifelong learning.
The current and future needs of IAR will be mirrored in the curricula of the new dual study program.
So far, the announcement of the DIARKAZ ideas of DHE have found an audience in several conferences, which demonstrates the great interest of all stakeholders. The relevance of the dual approach is evident and the demand of corporate partners for experts in Automation and Control as well as in Mechatronics and Robotics, expressed by the industry, is remarkable. Nevertheless, there is the need to clarify the role of the respective companies in providing for an adequate practise-learning environment and also somehow recognise and remunerate the students' contribution.
On the whole, the high relevance of the DIARKAZ project encourages the consortium to continue on track, however adapt solutions to existing preconditions of the Kazakh governmental framework as well as the developments of the IAR sector.

EU Education, Cooperation & Development policies

The DIARKAZ project contributes significantly to EU Cooperation & Development policies as well as to dissemination of EU Higher Education policies. We strive for promoting the tools used in EHEA network in the partner country Kazakhstan and thus create visibility of and interest in EU Higher Education concepts. As the Kazakh Ministry of Education aims for coherence with the Bologna Process in all levels of the country's education system, we are confident that our project will contribute for a big step towards this aim.
DIARKAZ targets the main issues concerning the employability of students and graduates which is in line with national plan for socio-economic development. Our project aims for modernising and advancing access to HE, as well as strengthening the relations between HE and the wider economic and social environment. In the end, one of the main goals is to increase the employment rate of young Kazakh citizens. The project directly corresponds to relevant CBHE EU policies (e.g. ET 2020) and national priority for Kazakhstan, which is "Modernisation of curriculum by developing new and innovative courses and methodologies" (Category 1): Mathematics and statistics, Information and Communication Technologies, and Education. Additionally, the project corresponds to priorities in Category 3 for Kazakhstan: Lifelong learning and University-enterprise cooperation.
Our project does not only direct its activities towards first-degree students, but also to professionals of respective IAR industries in terms of Life Long Learning. Different stakeholders can bring in their perspective when addressing the design of curricula for the LLL units.
Companies, professionals, policy makers and other non-academic stakeholders are involved into DIARKAZ project activities mostly through the existing networks of partner Universities in Kazakhstan as well as by involvement of ATAMEKEH and KAAR and our two industry partners in the project.
In order to take into account labour market needs, the project team, within WP1.1. and WP1.2., has organized survey and roundtable discussions with representatives of employers.
The creation and modernisation of curricula for Dual HE in IAR was shaped by the requirements of Industry 4.0 including various aspects of digitisation. Learning outcomes largely comply with EU standards. In the first half of the project, a basic curriculum for IAR was agreed upon.
The partner Universities co-operate and enable mobility of their students by allowing for studying in different places, which very much resonates with one of the vital ideas of the Erasmus+ program. In order to support the implementation of the curriculum in theoretical and practical learning, we have organised a Workshop on Teaching Methodologies to provide for competence-oriented tools against the background of the dual teaching and learning paradigm.
For fostering synergies, we invited partners form the Erasmus+ project KAZDUAL, which also focuses on Dual Education, to co-operate and take part in our webinars. We believe that this alliance will enhance the quality and outcome of both projects.
In the second half of the project, the implementation of the new Bachelor and LLL programs will be the main objective. As the consortium is very ambitious in terms of dissemination, we expect a wide-ranging impact of our DIARKAZ project.

Quality of the project implementation

Description of the implemented activities

The project officially started in January 2020, when outbreak of Covid19 has begun. Due to pandemic, we had to postpone some of our activities and to switch on online mode of operation wherever it was possible. The major part of activities in the first part of the project is finished.
In WP1, Development of dual study program in IAR, all activities are finished, from the analysis of best practice, through survey of stakeholders in IAR, consensus about learning outcomes and competencies, to development of joint curriculum, and development of contractual documents.
In the WP2, Preparations for implementation of new bachelor and LLL programs, the significant delay was in the purchase of equipment, due to disturbed supply channels because of Corona pandemic, so it was necessary to wait for delivery. Additionally, administration at some partner universities was working with reduced capacity. Finally, at WKATU the equipment was installed in June 2021, at KEEU in August 2021, while INEU will finish the purchase during September 2021.
Only one activity had to be cancelled in the first half of the project, and it is Activity 2.4: Study visits of staff from Kazakhstan to program countries. This is very important activity for the transfer of knowledge and expertise in the field of dual education and IAR. We have made the report about best practices and organized a several online presentations for teachers in Kazakhstan, but face-to-face meetings of teachers and visit to premises and companies involved in dual HE in Europe is irreplaceable and consortium decided to organize study visits as soon as possible. The rest of the activities in WP2 are planned for the second half of the project lifetime.
In WP3 Implementation of the program. Important note: We are developing one joint dual study program at bachelor level, but all three Kazakh universities mut register the program and go through accreditation individually. One very important activity is finished: Registration of the dual study program in national register. According to accreditation rules in Kazakhstan, after registration, universities can enrol students in the first year, run the program for two consecutive year, and then submit the request for the accreditation. This approach provides better adjustment of new study program during first two years and almost guarantee the accreditation afterwards. The first generation of students on dual study program in IAR will start attending the courses in October 2021, after promotional campaign and enrolment during the spring 2021.
WP4 Dissemination and exploitation of project results, is going according to plan, where dissemination plan was developed, project website launched in March 2020 and constantly updated with news and reports. We have also made profiles on social networks with the purpose of constant raising o awareness for DIARKAZ among stakeholders. Additionally, Kazakhstan partners have developed a Career guidance plan in order to systematically help students enrolling IAR.
WP5 Quality control and monitoring, is also going according to plan, with developed plan for QA and set of metrics for measuring quality of implementation of dual study program and the project as a whole. Internal project control and monitoring is a constant activity at the project.
In WP6 Project management, we have intensified the communication among partners, through organization of four steering committee meetings, several local committee meetings, meetings with companies, workshops and bilateral meetings. Only kick off meeting and meetings with companies were organized face-to-face, while everything else was organized on Zoom platform. The goal is to keep all partners alert and dedicated to project activities.

Quality assurance

The QA during the lifetime of the project is very important to achieve the set goals. The Quality manual defines roles and responsibilities for all participants, and a clear procedure for QA. The Plan determines and describes quality expectations and quality metrics of project outputs and outcomes and project-related activities, as well as the key aspects and procedures for internal and external monitoring and risk management.
The key role in QA belongs to the Quality Committee Team (QCT). QCT consists of one representative per each project partner. The duty of the QCT is to monitor and evaluate the progress of the project and to ensure that all its activities are carried out properly and following QA guidelines, within time and budget constraints. The work of QCT is coordinated by the leader of WP5 Quality control and monitoring. Other responsibilities include: preparation of Quality and assessment plan, preparation of metrics and indicators for quality control and monitoring, together with WP leaders and Project Coordinator monitor and evaluate the quality of project deliverables and suggest improvement strategies, preparation of internal quality reports on regular basis, etc.
After the first half of the project the control and monitoring process was performed following the conditions and requirements of the project, especially relying on the experience of EU partners that have successfully implemented dual undergraduate IAR study program. The quality control and monitoring consists of 4 activities planned for the entire duration of the project:
•Development of quality and assessment plan
•Defining metrics that will be used to analyse DIARKAZ
•Internal project monitoring and control
•Report on external evaluation
The quality control started by the first day of the project and was set when all the project partners agreed on the common developed quality and assessment plan. Quality control of the project is done and will be done continuously through a series of evaluation meetings, especially through a series of Local Committee meetings; all organized and linked to other project events, for the reasons of cost-effectiveness, but due to the Covid situation also through a number of on-line meetings which were not planned at the beginning of the project but are merely necessary to follow the progress of activities in the project as the plan is very demanding. At these meetings all open issues are discussed, and eventual corrections initiated. At the end all internal and other reports will be gathered by the Steering Committee, which will generate and submit the final report about quality.
The WP 5 leader FHJ developed a Plan for Project Quality Control The first draft was presented at the kick-off meeting and the final version was consolidated and confirmed by the steering committee. Although, the quality plan is a “living” document which is being complemented continuously. Also Metrics was defined, which represents the basis for the check-up of achieved indicators in the project: operation of the study program, number of contacts with companies, number of engaged students, employability of students, etc. Moreover, a special set of metrics was defined for measurement of students’ performance at study program and courses individually through a system of learning analytics. For the second half of the project external evaluation of developed study program will be organized. Two independent external experts will be subcontracted in order to evaluate the quality of the developed bachelor program. Based on the report of these external experts, fine-tuning of study program will be performed.

Visibility

The project logo, as the main element of the visual identity of the project, corresponds with the main idea of the project and is visible and attractive. The project logo was developed during the first month of the project by KEEU, the leader of work package 4 Dissemination and Exploition, and was chosen as the official project icon. The latest version of the project dissemination plan was adopted on 18 April 2020. The project logo was used in all project deliverables. It can be seen on the project website https://diarkaz.kineuprojects.kz/.
The project website, as one of the main tools for project visibility and dissemination of project results, was launched by April 2020. An analysis of the Erasmus+ project websites was carried out and based on this analysis an initial website structure was developed. The project website www.diarkaz.kineuprojects.kz is hosted and maintained by Timeweb. According to the suggestions gathered during the SC meetings, the website is continuously being improved.
The website contains a menu with links to the most important project details such as Home (with details of its objectives, work packages and participants), News (with all project related activities including study visits, promotional events (with photo galleries), significant achievements, etc.), Project Outcomes (where all developed project results are presented in electronic form and can be accessed and downloaded), etc. In the central part of the website's home page, there is a video in which the project coordinator, Professor Mirko Savic, talks about the project and its activities, and on the left of the page there is a project banner with the logos of all project partners. The Partners tab also contains the logos of all partners with hyperlinks to their websites. The project website is maintained in three languages (English, Kazakh and Russian), and is regularly updated and maintained by KEEU.
Google Drive is also used to share files and distribute all necessary materials (minutes of meetings, reports, surveys, draft results, etc.) and collaborations. It also contains the necessary project templates: PowerPoint presentation, result/report, agenda, list of participants, participant feedback form, event report, internal report, risk monitoring sheet, etc. To date, there are more than 200 document downloads on the website.
Taking into account the popularity of social networks, especially among promising students as a key target group, we have created accounts in the three most significant social networks and allocated responsibilities (creating and maintaining accounts) among partners: Facebook (INEU), Instagram (WKATU), LinkedIn (UNS). All social media accounts are linked to the project website (icons at the bottom of the homepage). All of them are used for visibility and promotion of the project, as well as for communication with all stakeholders and target groups. All social media accounts of the DIARKAZ project collectively have around 200 followers at the moment.
Project partners also promote the DIARKAZ project on their official websites and in social network profiles, providing a brief description of the project, a logo and a link to the DIARKAZ project website.
All publications and results of the project, including the project website, comply with the EACEA guidelines for project visibility (project logo, Erasmus+ logo, project name and reference number, EU disclaimer).
Based on the Project Application and the Grant Agreement, WP4 Coordinator: Dissemination and Use of Project Results KEEU constantly coordinates the dissemination of activities and results of all partners, as well as the visibility of the DIARKAZ project.

Equipment

In December 2020, the Kazakhstani partners of the project completed the updating of the equipment previously specified in the project application and in February 2021 received permission to make changes. Since KEEU and INEU are private universities and have the right to purchase equipment without holding a tender, the consortium decided that INEU would purchase equipment on its own, and KEEU would purchase equipment both for itself and for WKATU.
On 25 January 2021, Annex 03-61/40 to the Partnership Agreement was concluded by the UNS project coordinator and KEEU to regulate the details of the procurement of equipment for WKATU. A similar Annex was concluded by UNS and WKATU.
The procedure for purchasing equipment for WKATU began in January 2021. KEEU signed contract № 50 with Uchtekhtransit («УчТехТранзит») LLP (Russia) for the amount of 54,840 euros. On 24.02.2021, the first tranche for the equipment was transferred. On May 26, 2021, KEEU received notification from the supplier that the equipment was available and on 09.06.2021, the second tranche was transferred. On June 22, 2021, the equipment was delivered and installed at WKATU.
KEEU signed contract № DID-21-01 with FESTO-RK LLP in April 2021. The cost of the contract was 57,882 euros. The prepayment was made on 04/27/2021. 07/05/2021 the equipment was delivered to KEEU. During August and September, the university is repairing the classroom and purchasing the necessary furniture and computers at its own expense. The installation of equipment and training by the supplier was finished August 2021. Thus, the equipment will be ready for use for the upcoming academic year.
INEU also plans to make a purchase from FESTO-RK LLP, since the equipment corresponding to the technical specification is available for sale in the Republic of Kazakhstan only from this supplier. The above-mentioned company requires 100% prepayment and does not consider other payment options. In this regard, an additional agreement was executed, according to which changes could be made in terms of financing (Article 6 of the Payment Conditions). INEU has sent the original documents to the University of Novi Sad, the amendment of partnership agreement was signed, and the purchase of equipment will be finished by September 2021.

The project includes activities relating to curriculum development

(•) Yes

HIGHER EDUCATION: Promoting internationalisation, recognition and mobility, supporting changes in line with Bologna principles and tools.

Diarkaz takes into account the principles set out in the Bologna process completely (integration in the 3 cycles, definition of learning outcomes in accordance with a national and European Qualification Framework EQF, application of student-centred approaches, compatibility with European Credit Transfer System ECTS and with the European Standards and Guidelines ESGs for QA). The developed dual study program is based on the EQF and ECTS set standards as the feedback to the models of changed curricula in the partner universities stands on the dual program in Germany and Austria. It is a challenge to pass the idea of the dual principle, make it understandable and bring it to live at the partner universities, but always with the high level of enthusiasm, dedication, support and hard invested time and work from all involved project partner institutions.
International orientation of Dual study program in IAR is also one very important aspect, because at the Kazakh partner universities there is a very small number of foreign professors and international students. The project wants to boost the international cooperation by organizing study visits to the partner countries for teachers who will teach at new courses. They will share their gained knowledge in organized workshops where also participants from the industry will take part where the EU colleagues will play the instructional and advising part. Additionally, also a LLL seminar will be developed and conducted by EU partners.
The project team already took the opportunity to promote the project idea and the development of the dual study program in IAR internationally, and all information that we are distributing are in English and Russian/Kazakh language. There has been also the opportunity to participate in the conference of GeKaVoc/KAZDUAL project to merge and share ideas on the development of study programs in Kazakhstan. In addition, a bilateral agreement between the two universities – FH JOANNEUM and KEEU was established to encourage the mobility of staff in the upcoming study period in autumn.

New/updated courses

Each Kazakhstani university has introduced the JEP "Robotic Systems" into the Unified Higher Education Management System (ESUVO) and information systems of universities. Working curricula have been formed for 100%, as well as a description of disciplines with an indication of goals, tasks, sections, competencies.
Kostanay engineering and economics university named after M. Dulatov (KEEU)
During the development of the educational program "Robotic Systems", 11 new courses were developed, namely: Introduction to Mechatronics and Robotics, Technosphere Safety, Fundamentals of Mechatronics and Robotics, Components of Machine Vision Systems, Control Devices Based on Microcontrollers, Industrial Programming, Automation System Design, Interface Device and Communication Protocol, Hydraulic and Pneumatic Drives of Mechatronic Systems, Group Control Systems for Intelligent Robots, Interchangeability, Standardization and Technical Measurements. The total volume of the developed courses is 44 credits or 1320 hours.

The number of updated courses is also 11: Algorithms, data structures and programming, Object-oriented programming, Technological processes of machine-building industries, Automation of standard technological processes and productions, 3D modelling in CNC machines, Automation elements and devices, Robotic processes and systems, Programming for machining parts on CNC machines, Industrial controllers, Automated metal-cutting equipment, Methods of adaptive control of robotic and mechatronic systems. All courses have been updated taking into account the specifics of the new JEP, its focus on the study of robotic and mechatronic systems. The total amount of updated courses is also 44 credits or 1320 hours.
Zhangir Khan West Kazakhstan agrarian-technology university (WKATU)
There are 9 new courses at WKATU: Information systems in robotics, Algorithms, data structure and programming, Robotic system electric drives, Analog and digital electronic devices, Basic robotics and microprocessor technology devices, Robotic systems control, Modern automation technologies, Software for mechatronic and robotic systems, Computer modeling of processes and systems in robotics.
There are 7 updated courses: Integrated and microprocessor circuitry, Industrial controllers, Microcontroller programming, Computer-aided design and construction systems, Installation and operation of robotic devices, Automated metal-cutting equipment, Programming for processing a part on CNC machines.
All courses have 3 and more credits and are included in the curriculum of the educational program "Robotic Systems"

Innovative University of Eurasia (INEU)
In total, according to the application, it was planned to introduce 9 new disciplines and 10 updated disciplines.
7 new disciplines have been introduced, 2 disciplines coincide with the UP of partner universities (a total of 9 disciplines according to the plan).
List of new disciplines: Programmable microcontrollers, Development of mobile applications, Automation of technological processes and production, Simulation of robot movement, Control and diagnostics of robotic systems, Robot control devices, Reliability of robotic systems.
The project application specified 10 updated disciplines. Some disciplines were changed taking into account the change in the direction of training to the group of educational programs B064 Mechanics and metalworking: Electronics, Distributed management information systems, Computer systems design, Intelligent systems, Programming technologies, Object Oriented Programming in C ++ Builder / C #, Engineering and computer graphics, 3D-modelling, Digital circuit technology, Microprocessor technologies.

○ No

Teaching / Training Activities

◉ Yes

Mobility for Teaching, Training and/or project research activities

So far, we had only one mobility in February 2020: To Kostanay (Kazakhstan) for the kick off meeting and first introduction of local partners and stakeholders with dual education.
Due to Covid19 pandemic Activity 2.4: Study visits of staff from Kazakhstan to program countries, is postponed for the second half of the project. This is very important activity for the transfer of knowledge and expertise in the field of dual education and IAR. We have made the report about best practices and organized a several online presentations for teachers in Kazakhstan, but face-to-face meetings of teachers and visit to premises and companies involved in dual HE in Europe is irreplaceable and consortium has decided to organize study visits as soon as travelling restrictions across Europe and in Kazakhstan are relaxed.
According to project proposal, we are planning to organize three study visits, to Novi Sad, Graz and Heilbronn, and one training of teachers and tutors in Graz. Beside travelling to European countries for study visits and training, there will be several visits of professors from FHJ, DHBW and UNS to Kazakhstan, where training sessions related to dual education and industry automatization and robotics will be organized.

○ No

Quality of cooperation

Project management

Project management is carried out at the overall (consortium) level and at the local level including only Kazakhstan partners. All aspects of project implementation are followed and managed through reporting system. All consortium partners participate in project management.
The process for finalizing the Partnership Agreement was conducted in time with all partners. The process of signing the partnership agreement was organized by the project coordinator. Each partner has received a draft of PA, where all responsibilities of the partner according to the Project Description were added. The partners had an opportunity to communicate these responsibilities before signing PA.
The major decision-making body of the project is Steering Committee (SC), which consists of representatives from program countries and Kazakhstan partner organizations. It monitors all project activities, evaluate deliverables, produce detailed reports on implementation and suggests further activities. The Steering Committee coordinates the creation of quality and evaluation strategy, dissemination and exploitation plan, and provides an input into strategic and organizational issues and define the project standards and agree on all project policies that must be formally and explicitly stated. Tasks assigned to consortium partners are becoming contractual obligations. The Steering Committee has met 4 times so far. The kick of meeting was organized as face-to-face session, before Covid19 pandemic, while the following three meetings were organized online on Zoom platform.
The responsibilities of the SC are to: (1) Review project progress and control the activities; (2) Ensure that the project maintains its relevance; (3) Be aware of relevant activities in other projects; (4) Resolve any technical administrative or contractual issues, which have not been resolved by other means within the project; (5) Be the overall quality manager of the project. Decisions are taken on a consensual basis. In case of disagreement, the Steering Committee is making the final decision.
The internal communication is conducted by emails, phone, Zoom, Skype, Google pool, etc. For collecting information, a shared folder with predefined structure in Google Drive was organized by the project coordinator. The folder structure consists of project documents, reporting documents, deliverables, study visits, SC and LC meetings, and documents and templates related to visual identity of ADA project. Each partner has full access to each folder.
For the internal project communication, a mailing list and Zoom are widely used by all partners. The consortium meetings are conducted in English. English also is used for the mailing lists announcements.
Local Committee (LC) monitors implementation and organization of activities in Kazakhstan, and actively participate in dissemination of project results. Seven LC meetings in total are planned during the project realization. So far, LC meetings are organized jointly with SC meetings, and three separate LC meetings, in February and April 2020 and in April 2021.
A detailed allocation of resources and distribution of tasks within the project is carried out equally between the partners and in accordance with the requirements for the implementation of each working package. All partners are engaged in certain activities of each WP. The issue of the ownership of the project results is discussed at the Consortium meeting and it is defined in the Consortium Agreement.

Involvement of partners and stakeholders

The responsibilities between the partners are distributed equally. For six WPs, five different partners are the leading organizations: WP1: KEEU, WP2: INEU, WP3: WKATU, WP4: KEEU, WP5: FHJ, WP6: University of Novi Sad. Partners from Kazakhstan are particularly actively involved in the development of WP, since the development of an educational program in the field of IAR, its implementation and LLL courses should be conducted in Kazakhstan. All partners from Kazakhstan participate in consortium meetings, Local Committee meetings and training events, during which they communicate, learn and improve their potential in the field of IAR.
The partner enterprises SaryarkaAvtoprom LLP and Ural Transformer Plant LLP are important partners for the consortium in the development and implementation of the new dual education program. The expert opinion of the employees of these enterprises - specialists in the field of industrial automation and robotics - is key in terms of the disciplines content, the development of the educational process schedule, and the selection of educational equipment.
Associated partners such as the Kazakhstan Association of Automation and Robotics (KAAR) and the Festo Group contribute to the project objectives by performing tasks in which their expertise is very useful. KAAR provides substantial support to the cooperation of the project consortium with companies in Kazakhstan and contributes to better dissemination of the project results. Thanks to the KAAR and its members, companies in Kazakhstan participated in a survey, the purpose of which was to identify the necessary skills and competencies of graduates and the willingness of companies to cooperate with universities in the implementation of dual training; they will also be involved in dissemination activities.
The selected EU partners are the best for achieving the project objectives. An important factor in selecting EU partners was the need to have colleagues with well-developed programs in the field of dual education. For instance, within the framework of online seminars and webinars, Kazakh partners had the opportunity to learn about the methodology, tools of dual training, the experience of cooperation with companies, the implementation of the educational process within the framework of dual educational programs of such leading universities as FHJ and DHBW.
The needs of partner countries in the development of dual educational programs are taken into account through the participation of representatives of various target groups: companies, universities, teachers, students and politicians. Before starting the development of the educational program "Robotic Systems", a large survey on companies was conducted to find out the opinion about the competencies that professionals in the field of IAR should have. Also, representatives of various stakeholders actively participate in meetings where they exchange their ideas with the project team. On the other hand, the project team members participate in meetings of various stakeholders (events of the Erasmus+ Project in Kazakhstan, LaTFURE project training, the International Scientific and Practical Conference of the GeKaVoC and KAZDUAL projects, etc.).
Students are a very important interest party and they are not involved in project management, but they are reached through career guidance activities in schools and colleges, job fairs, and regular dissemination events at the three universities in Kazakhstan. The participation of students will be crucial at the stage of implementation of the dual educational program "Robotic Systems". Together with representatives of companies, they will participate in monitoring the quality of the joint educational program of Kazakhstani universities and the project as a whole.

Management of the grant

Budget for DIARKAZ project is balanced, harmonized among partners and among work packages. The timely and cost-effective accomplishment of outcomes is secured primarily by efficient management within the work packages and by the strict control of performed academic activities and of the financial flow. To secure the timely realization of outcomes, the Steering Committee (SC) and the project coordinator closely monitor the performance of partners during the project realization. The transfer of funds to the partners depend on their delivery of expected outcomes and submitted reports. On every Steering and Local Committee meeting, the project management team defines measures for overcoming problems or obstacles in realization of the project and revise the work plan if necessary, to ensure timely realization of the project. All equipment purchases for the purpose of project realization, regardless of the equipment value, are done through tendering or on the basis of three competitive bids. Mobility in the project are defined in a way that guarantees performing multiple tasks whenever possible (study visit + SC meeting + LC meeting). The financial management of the grant is conducted according to the defined Quality and Assessment Plan, where the contents of all documents and forms are defined. Furthermore, the universities in Kazakhstan apply strict policies in order to make legal decisions to regulate the financial management within the institutions. Project co-financing will be provided by additional work of project staff members for the purpose of obtaining desired outcomes. If the right conditions are fulfilled, the organization of the final conference, banking fees and cost of money transfer will be co-financed also. The total budget (EU grant) of the project is 693,263.00 EUR. The total staff cost (263,443.00 EUR) is planned according to the distribution of activities to all project partners and necessary work to be done. The planned travel costs are 91,090.00 EUR and costs of stay equals 109.080.00 EUR. Equipment costs (162,000.00 EUR) are planned according to the needs of all participating HEIs from Kazakhstan, with constraint of 30% of the project budget. The equipment is needed for starting and running Industry Automatization and Robotics study program and LLL courses at three HEIs in Kazakhstan. This equipment will allow HEIs to provide students with appropriate lab conditions for practical work in industry automatization and robotics, similar to the equipment used by companies were students realize their practical part of education. Subcontracting costs (67,650.00 EUR) are planned for each partner according to the planned WP activities of the partner. The subcontracting costs cover project auditing, accreditation cost, printing dissemination products, conference proceedings, translation services etc. Roughly, there are three groups of partners having the balanced budget:
a) HEIs from Kazakhstan: total budget amount ranging from 121,865.00 to 130,070.00 EUR
b) Partners from EU countries: total budgets ranging from 65,635.00 to 116,699.00 EUR
c) Non-HEI partners (companies) from Kazakhstan: total budgets ranging from 21,247.00 to 27,342.00 EUR.
At the moment, institutions from Kazakhstan participating in the project realization, have spent their budget predominantly on the equipment, travel and costs of stay budget lines – and the staff costs will be compensated after the second pre-financing (it is expected that 70% of the first pre-financing will be spent in next couple of weeks, depending mostly on Covid-19 lock-up and consequently on delivery of equipment by vendors). The detailed summary of the current state of the Projects' finances is presented in the Financial Statement accompanying this Report.

IMPACT AND SUSTAINABILITY

Awareness raising, dissemination, sustainability and exploitation of the project results

Actions already undertaken: a dissemination and implementation plan and a project logo were defined at the beginning of the project; a project website and social media profiles were created. The project members participated in a large number of meetings, media events, workshops, summer schools, raising awareness about the DIARKAZ project and the joint educational program "Robotics Systems". More intensive promotional activities are planned for the second part of the project, after the recruitment of students and accreditation of educational programs, when all available advertising channels and paid promotion in social networks will be used to attract students and raise awareness of a wider audience.
In HEIs, partners regularly inform students, teachers and policy makers at various meetings (lectures, staff meetings, decision-making bodies meetings, meetings with teachers from other departments). Unfortunately, the world situation due to the coronavirus pandemic has postponed study tours, but the online training and workshops have also provided an excellent opportunity to ensure visibility within each organization and beyond. We have been raising awareness of the project through the Kazakhstan Association of Automation and Robotics and its distribution channels. Stakeholders can access information about the project through the website, social media, conferences and publications. All universities involved in the project are very active internationally and have many partner organizations in different countries that are informed about the project and its results.
Sustainability: developed training materials and methodological guidelines prepared in the next phase of the project will contribute to the sustainability of the project after its completion. The support of decision makers and employers ensures the sustainability of project results. Participants from universities are also researchers: they are already preparing publications and in the future, they will have presentations in the field of industrial automation and robotics.
We have included employees of international offices in our teams to include our visiting professors in the mobility program in order to ensure the long-term involvement of foreign teachers after the completion of the project.
We are referring to three potential sources of funding after the completion of the project. After accreditation, the program can be funded like any other accredited program. This means that students can participate in a competition for a state educational order for training personnel. Since the Kazakh Ministry of Education and Science has recognized education in the field of "Engineering" as a priority, the probability of receiving financial resources from the state budget is very high. From 2021 to 2024, 1,350 grants have been allocated for the group of educational programs "Mechanics and Metalworking", to which JEP "Robotic Systems" belongs.
The second source is tuition fees from students. The priority for us is to attract students from the Kostanay, Pavlodar and West Kazakhstan regions, because three Kazakhstani universities will be the only higher educational institutions offering training in a dual system. We will promote this curriculum to a wider market through the regional network of the Kazakhstan Association of Automation and Robotics and our international connections, since Kazakhstan has many comparative advantages in relation to international students: low living and tuition costs, the country's location in the centre of the Eurasian continent, political stability, etc.
The third source is LLL courses. Many companies in the region will be interested in improving the competencies of their employees in the field of industrial automation and robotics.

Statistics and Indicators

Type of equipment:

- [ ] books and pedagogic material
- [ ] audio-visual equipment

- [x] Computers and software
- [x] lab material
- [ ] Other

For Curriculum Development projects

- [ ] Yes

Level of new/updated courses:

- [ ] Short cycle
- [x] 1st Cycle (e.g. Bachelor)
- [ ] 2nd Cycle (e.g. Master)
- [ ] 3rd Cycle (e.g. Doctoral)
- [ ] Vocational Education and Training

Type of recognition:

- [ ] HEI Degree
- [x] National degree
- [ ] Multiple Degree
- [x] Joint Degree

Volume (in ECTS) of new/updated courses	212

The new study programme includes:

- [x] Placements/internships for students
- [x] Career orientation service
- [x] Career development measures

Number of learners / trainees enrolled (per intake / course delivery)	45

Type of skills/competence developed:

- [ ] Transversal/behavioural skills
- [x] Technical /academic /scientific / research skills
- [x] Linguistic competences

% of the new curriculum taught in foreign language of the the total of new curriculum developed by the project	100

For Training/Mobility Activities

Number of partner country "HEIs' students" trained	45
Number of partner country "HEIs' academic staff" trained	38
Number of partner country "HEIs' administrative staff" trained	5
Number of partner country "non-HEI individuals" trained (priv. sector, NGOs, civil servants, etc.)	7

IMPACT AND SUSTAINABILITY

Impact at individual level

Extent of attention given to vulnerable groups	totally accomplished
Number of direct beneficiaries in the Partner country(ies) per year: academic staff from HEIs	38
Number of direct beneficiaries in the PCs (/year): administrative staff from HEIs	5
Number of direct beneficiaries in the PCs (/year): HE students	45
Number of direct beneficiaries in the PCs (/year): non HE individuals	7

Impact at institutional level

Extent of impact at institutional level: for instance new courses / strategies (policies, regulations) / services (units, centres)	totally accomplished

Potential of planned project measures to contribute to new national cooperation activities in the Partner countries HEIs as a result of the project (Memorandum of Understanding /research projects / joint publications /participation in networks or associations etc.)	totally accomplished
Potential of project to contribute to new international cooperation activities in the Partner countries HEIs as a result of the project (international agreements / Memorandum of Understanding / research projects / joint publications / participation in networks or associations, etc.)	to a very high extent

Impact on the HE Sector

Potential of project to contribute to new (/updated) national or regional policies / laws / regulations in HE	totally accomplished
Potential of project to contribute to the establishment (/ further development) of external bodies (/associations /agencies)	to a small extent
Potential of project to contribute to improve the excellence / competitiveness / attractiveness of the Higher Education institutions	totally accomplished
Innovative character of the planned results (i.e. the courses developed; the new tools, services, procedures delivered; the strategies implemented for reaching the target groups; etc.)	totally accomplished

Impact on the society as a whole

Potential of the project to pay particular attention to least developed countries	totally accomplished
Potential of the project to engage Partner Countries HEIs in new means of cooperation with employers and other stakeholders (e.g. NGOs, associations, etc.)	totally accomplished
Measures contributing to improving lifelong learning approaches in the Partner Country HEIs	totally accomplished

Sustainability

Institutional support for Partner	totally accomplished

Country HEIs to sustain project results	

Measures to collect Sources of financial (/logistic) support for sustaining the project results from:

- [ ] Partner HEIs
- [x] Public authorities in Partner countries
- [ ] NGOs
- [x] Private sector
- [ ] European Union
- [ ] Other

QUALITY OF PARTNERSHIP & COOPERATION

Involvement of students in the project implementation	totally accomplished
Involvement of non-educational stakeholders in the project implementation	totally accomplished

RELEVANCE in relation to project objectives

To what extent the project contributes to the policy objectives of the Partner Countries	totally accomplished

Project potential to promote EU's horizontal policies

- [ ] Agriculture, fisheries and foods
- [x] Business
- [ ] Climate action
- [ ] Cross-cutting policies
- [x] Culture, education and youth
- [ ] Economy, finance and tax
- [x] Employment and social rights
- [ ] Energy and natural resources

Environment, consumers and health

- [ ] External relations and foreign affairs
- [ ] Justice, home affairs and citizens' rights
- [x] Regions and local development
- [x] Science and technology
- [ ] Transport and travel

Meetings,Training and Mobilities

Meetings, Trainings and Mobilities

Estimated dates of consortium meetings until the end of the projects

Venue country	Venue city	Date of Meeting
Kazakhstan	Pavlodar	21/11/2022
Kazakhstan	Kostanay	22/03/2022
Kazakhstan	Oral	13/12/2021
Kazakhstan	Kostanay	19/12/2022
Kazakhstan	Kostanay	12/09/2022
Kazakhstan	Oral	16/05/2022
Austria	Graz	04/04/2022
Kazakhstan	Pavlodar	01/03/2022
Germany	Heilbronn	01/02/2021
Austria	Graz	06/12/2021
Serbia	Novi Sad	11/10/2021

Training and Mobilities

Event	Purpose	Type of participants	Gender	Number	Country of Origin	Country of destination	Duration (in weeks)	%compared to objectives

Attachments

Type of File	Name of the File
Budget Table	2021 09 Financial statement DIARKAZ 10.9.2021..xlsm
Declaration of Honour	DIARKAZ_DoH.pdf
Table of achieved results	DIARKAZ annex_c_table_of_achieved_planned_results_1.docx
Dissemination/Exploitation Plan	4.1 Dissemination and exploitation plan.pdf
Quality Assurance Plan	5.1 Quality control plan.pdf
Request for Payment	
Specification 1	
Specification 2	
Specification 3	
Specification 4	