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Development of practically-oriented student-centred education in the field of modelling of Cyber-Physical Systems – CybPhys

609557-EPP-1-2019-1-LV-EPPKA2-CBHE-JP – ERASMUS+ CBHE

**MC and WS meeting
September 19 – 21st 2022**

Anatolijs Zabashta,
Project coordinator
Anastasija Zhiravecka
Riga Technical University

Agenda for September 19th

- Project progress
 - Implementation of the project KPIs
- WP4: Developing the Sharing Modelling and Simulation Environment platform
 - ✓ SMSE manual, staff training and examples for using SMSE for lectures
- WP3: Implementation of innovative ICT based teaching/learning environment
 - ✓ Joint activities within WP3 and WP4
- WP6: Dissemination
 - ✓ General status and opportunities. Updated communication plan
- MSc in CIS (prof. Maria Michel) – UCY

Agenda for September 20th

- WP2: Development and modernizing of curricula
 - ✓ Implementation of new developed courses in Ukraine
 - ✓ Documentation and training and teaching materials
 - ✓ Documentation of accreditation in partner's universities and Accreditation Office of Ukraine
- ✓ Arrangements for the TSS at UCY (3rd-17th of Oct, 2022 online or hybrid)
- WP5: Quality assurance
 - ✓ Feedback from stakeholders on new developed courses

Agenda for September 21st

- Recall to WP2 and WP6: Development and modernization of curricula. Dissemination activities during the Ukrainian war
- Further tasks and next steps
- Continuation of the project

Project progress

- Despite the warship Ukrainian partners continue the education process online
- Second curricula training report has been elaborated by Ukrainian partners
- Ukrainian partners arranged survey of industrial stakeholders.
- A draft of a form of the ***Report with recommendations for new master-level programs introduced in Ukrainian universities beyond the project D 6.4*** has been sent to the partners for consideration.
- New Dissemination plan and report is under way (is delayed)
- We are still waiting adjustments to the Grant Agreement due to rejection of Belarusian partners (*the main issue is to get a permission for an additional equipment*)
- We are still waiting decision about extension of the project

The project targets and deliverables

Courses and programs: new / updated

- BSU: courses 11/2; Programs 1/1
- GSU: courses 10/2
- MSPU: courses 4/1
- CNTU: Courses 5/2; Programs 1
- KhNTHU: Courses 2/4; programs 1
- KNU: courses 3/4; programs 1

Total: courses Belarus 25/5 and Ukraine 10/10 = 35/15 = 50

What we promised! *Indicators 1*

- Expected number of new/updated courses to be DEVELOPED/ ACCREDITED/ IMPLEMENTED: **50**
- Volume (in ECTS) of new/updated courses: **240**
- Number of planned learners enrolled per course delivery: **15**
- Expected number of partner country "HEIs' students" to be trained: **420**
- Expected number of partner country "HEIs' academic staff" to be trained: **120.**
- Expected number of partner country "non-HEI individuals" to be trained (priv. sector, NGOs, civil servants, etc.): **4**

Indicators 2

- Number of direct beneficiaries in the Partner countries per year: academic staff from HEIs: **102**
- Number of direct beneficiaries in the PCs (/year): students: **140**
- Number of direct beneficiaries in the PCs (/year): non HEs individuals: **16**
- % of the new curriculum planned to be taught in foreign language of the total of new curriculum developed by the project: **20%**

Table of training

	Event	Purpose	Type of participants	Gender	Number	Country of origin	Country of destination	Duration weeks	Compared to objectives%
1	Workshop WP1 10 - 11 March 2020	WS	teachers	M F M F	15 5 5 2	Belarus Belarus Ukraine Ukraine	Belarus Belarus Belarus Belarus	1 1 1 1	
2	July 27th, 2020 WP2, WP4 WP6. All partners 23 (13+10)	WS	teachers	M F M F	6 4 6 7	Belarus Belarus Ukraine Ukraine	Latvia Latvia Latvia Latvia	1 1 1 1	on-line
3	.August 3th, 2020 WS-Wp3 The Blackboard /Toledo environment is not accessible but is has been demonstrated at the ZOOM	WS	teachers	M F M F	5 3 6 4	Belarus Belarus Ukraine Ukraine	Latvia Latvia Latvia Latvia	1 1 1 1	on-line

Double Degree Master program development and accreditation: RTU - KNAHU

- To develop curriculum of the [double-degree Master Program](#)
- KhNAHU will accredit Double Degree master program at the Ministry of Science and Education of Ukraine
- Bilateral Agreements between RTU - KhNAHU.
- RTU will make adjustments in the existing master program, which do not require accreditation in the Ministry of Education
- RTU and KhNAHU start preparation to the student admission (practical arrangements, visa arrangement, etc.).
- The MS student admission Guide and Agreement will be developed

New teaching books - plan

1. Bringing innovations to the market – RTU, GSU
2. Mathematical Modelling of Mechatronic Systems – KU Leuven
3. Model-oriented control in Intelligent Manufacturing Systems – CNUT
4. Modern Mathematical Physics: Fundamentals and Application – BSU
5. High-Performance Scientific Computing and Data Analysis – BSU
6. Cyber-Physical Systems modelling and simulation – UCY
7. Cyber-Physical Systems for Clean Transportation – KNAHU
8. Control methods for critical infrastructure and Internet of Things (IoT) systems interdependencies analysis – RTU
9. Computer modeling of physical processes (handbook for students and PhD students)

New teaching books - implementation

1. Bringing Innovations to the Market, ISBN 978-9934-22-673-1
2. Mathematical Modelling of Mechatronic Systems, ISBN 978-9934-22-716-5
3. Model-oriented control in Intelligent Manufacturing Systems, ISBN 978-9934-22-674-8
4. Modern Mathematical Physics: Fundamentals and Application – BSU – several chapters are available
5. High-Performance Scientific Computing and Data Analysis – BSU- **not available!**
6. Cyber-Physical Systems modelling and simulation , ISBN 978-9934-22-675-5
7. Cyber-Physical Systems for Clean Transportation, ISBN 978-9934-22-676-2
8. Control methods for critical infrastructure and Internet of Things (IoT) systems interdependencies analysis – RTU (ISBN will be beyond the project)
9. Computer modeling of physical processes (handbook for students and PhD students) – we have all chapters, however, without translation.

Developing the Sharing Modelling and Simulation Environment platform: WP4

~~BSU~~ CPNU and UCY (methodical support)

Sharing Modelling and Simulation Environment platform

4.2. Development of the technical platform of the SMSE and designing of web interface for SMSE platform.

4.3. Development of computer classes with on-distance/ virtual laboratory in framework of SMSE platform

- *Development of computer classes with virtual laboratories in the framework of the SMSE platform.*
- *Development of learning and teaching methodologies and pedagogical approaches for the use of the SMSE platform.*
- *Organizing of on-distance/ virtual labs practicums for students of all partners,*
- *Creation a guidelines and instructions for on-distance/ virtual laboratories and distance learning tools usage which reside on the SMSE platform.*
- *Arrangement of the training /teaching workshop*

SMSE implementation

- CPNU will arrange a seminar for users of SMSE, in September at the meeting in UCY.
- Example of a course “***Computer modelling course***” will be demonstrated by CPNU team.
- Suggestion: each Ukrainian partner will prepare at least one lecture using Moodle and SMSE by the end of the project.

Implementation of innovative ICT based teaching/learning environment (WP3)

Ku Leuven University (methods), (BSU – technical support)

Development of innovative ICT based teaching and learning environment

3.1. Creation of Electronic Library.

Development of virtual environments for distance learning and virtual mobility on the base of Moodle platform.

3.2. Elaborating e-books, document sharing facilities, digital writing and publishing facilities.

3.3. Development of learning and teaching methodologies and pedagogical approaches for use of ICT

3.4. *Workshop on ICT tools in Brugge*

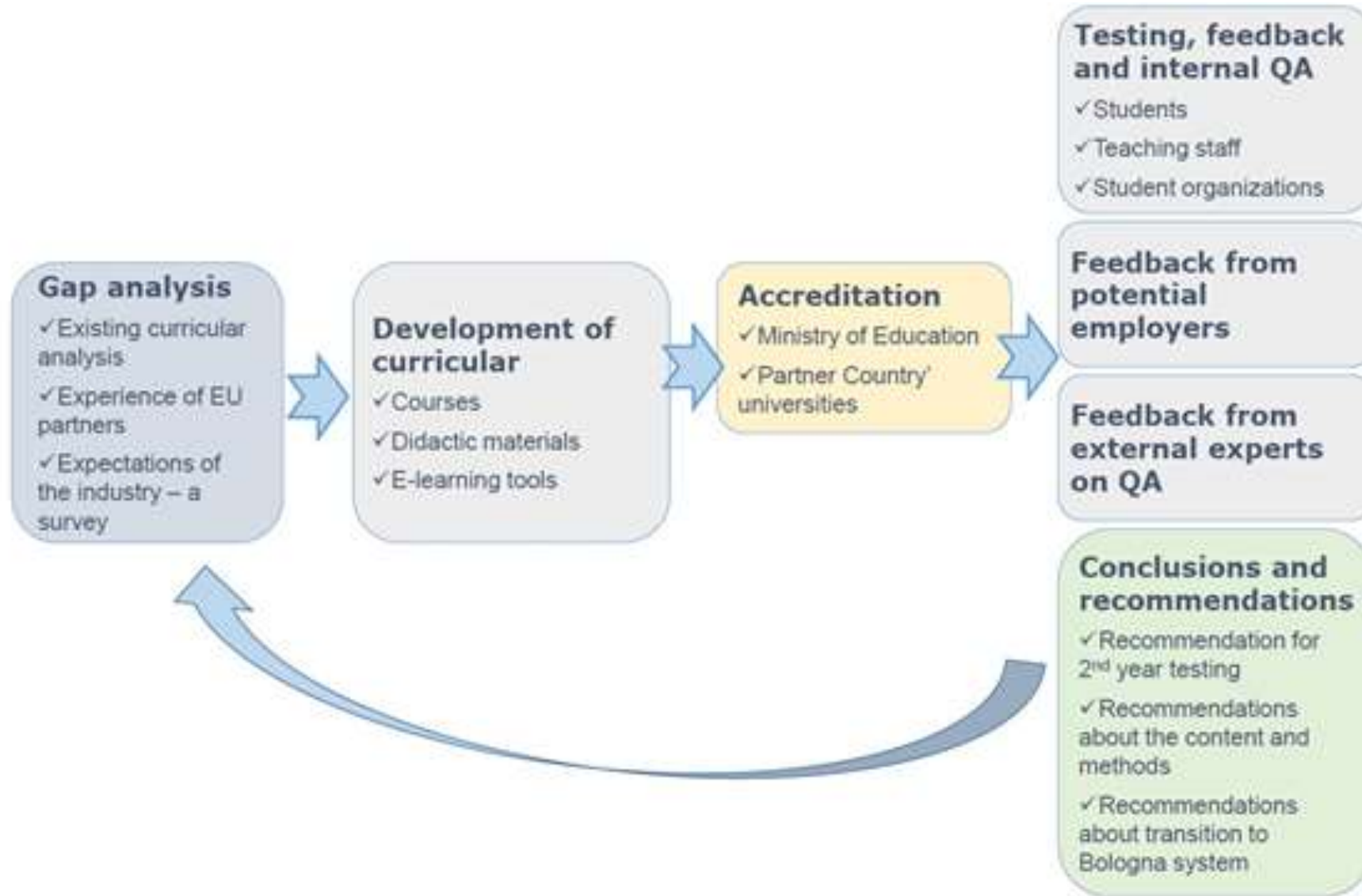
WP 5 Quality Assurance:

University of Cyprus and RTU – quality of project implementation

Method of new curricula testing with feedback from teaching staff, students, students organizations, and entrepreneurs (professional associations, enterprises, etc.) involved in student teaching and curricula enhancement

(covered 2.8; 5.5 and 6.4 of the QAP)

Sustainability Report with recommendation



- The overall approach aims to make sure the curricula are developed and adjusted according to the stakeholders' needs in CybPhys.
- It should be implemented in five stages:
 - Gap analysis (is done in WP1)
 - Development of new curricular (WP2-4)
 - Accreditation (WP2)
 - Testing and obtaining feedback from stakeholders (WP2 and 5)
 - Analyses, final adjustments, and planning for sustainability of CybPhys (WP6)

The suggested method getting a feedback from the stakeholders

- Each Ukrainian university arranges a survey of its stakeholders.
- A questionnaire includes two types of questions.
 - One type of question included **information about experts** (age, position, professional experience in education, science and industry, gender, etc.).
 - The **second list of questions included information concerning the expert's opinion on the quality of study programs and courses** and suggestions for improving study programs.

Methods for obtaining of a feedback

- For **each expert**, depending on the experience in the field of education, might be offered **several approved courses**/laboratory study programs.
- The analysis of the results of answers to questions should be presented in the **form of two tables**.
- **Comments** on the programs and courses, which might allow us to tune the programs after the testing is over, are welcomed.

Methods for obtaining of a feedback

- **Questionnaire** (for academy and for industry) of the peer review of experts **by courses/laboratory works study programs** from professional NGOs, research scientific institutes, enterprises, and universities
- **Summary** Table of the answers "yes" and "no" to the questions in questionnaires **for courses/laboratory** study programs (and comments)
- **Summary** Table of **professional experience of participants** in the survey
- **A report** is based on the results of peer review of tested curricula and courses/laboratory study programs
 - ✓ **Conclusions and recommendations**

Implementation of the curricular (WP2)

Belorussian State University

Dissemination and Exploitation and Sustainability of results (WP6)

Activities

- 6.1. Development of information and promotional materials.
- 6.2. Information sessions for target groups.
- 6.3. Project Web Portal and social media
- 6.4. Recommendations for new training programs for the targeted stakeholders beyond the project.
- 6.5. Strengthening the academia – industry network
- 6.6. Hosting and maintenance of e-Learning and SMSE platform beyond the project.
- 6.7. Strengthening cooperation beyond the project to sustain the outcomes.

Development of information and promotional materials

- Development a project logo.
- Press conferences will be arranged (at least 3 press conferences by PCs partners)
- Posters allocated in the premises, where equipment/software is installed and where teaching activities take place (6 PCs universities)
- Project leaflets issues (RTU)
- Distribution of promotional materials including regional TV and radio advertising.

Information sessions for target groups.

- Information sessions for students of secondary schools, university' students, universities teaching and academic staff.
- Seminars for stakeholders: professional associations, NGOs, SMEs, research institutions, students, universities teaching staff Ministries of Education and national accreditation offices.
- 2 regional stakeholder sessions: one in Minsk (arranged by RANI and Belarusian partners) and the second in Kharkiv
- Organisation of a Final conference
- The network universities – enterprises - institutes will be set up with the support of associated partners
- Spring conferences for master-level and PhD students (at RTU and UA-BY HEIs in May 2020, 2021, 2022).
- Partners will participate in international conferences related education topics with papers and presentations

Project Web Portal and social media

- -Design of Web Portal platform (RTU and UCY) and regular updating portal information
- -Project participants will regular update their portals with actual information;
- - Regular publications about the project and conducted studies and questionnaires at partners' websites.
- - User groups will be created at social networks in LinkedIn, Facebook, etc. (all partners).
- - Project deliverable's materials publishing in YouTube.
- - Advertising in social media about selection for students training in EU and BY-UA universities.
- - BY-UA partners will send direct mails to the schools aiming to invite to “open doors” events, stakeholders' seminars and conferences.
- - Project e-Newsletter, with all information about the reached results of the project and advertising about future plans and activities;
- - Publications and press realizes in mass media, TV, radio broadcasts and joint Newsletter of the Project.

Social networks

- LinkedIn
- Facebook
- ВКонтакте: <https://vk.com>
- Telegram Messenger <https://telegram.org>

- You tube
- ???

Recommendations for new master-level programs introduction in PCs universities beyond the project

- Analysis of feedback, gained during the first year of new courses/ programs testing.
- Elaboration of recommendation obtained in the meetings and workshops with associated partners and other stakeholders.
- Provide a report with recommendations for new training programs/ courses introduction in Belarusian, Ukraine universities in compliance with ECTS principles beyond the project.

Strengthening the academia – industry network

- Elaboration and signing Double-sided agreements for cooperation between project partners during the project running and beyond the project.
- Partners will agree that produced educational materials will be freely accessible through the use of open licenses.
- The university - enterprise network will be set up in the first project year with the support of associated partners.
- It will be used for dissemination and exploitation activities within the industry and research institutions sector.

Hosting and maintenance of e-Learning system and SMSE platform beyond the project.

- Agreements between HEIs responsible for hosting and maintenance of e-Learning and SMSE platforms (BSU) and the other partners beyond the project.
- Planning of the budget for hosting and maintenance of e-Learning and SMSE platforms beyond the project.

**Virtual meetings are
basically modern seances**



“Elizabeth are you here?”

“Make a sound if you can hear us?”

“Is anyone else with you?”

“We can't see you. Can you hear us?”

Further tasks and the next steps

P1	LV Riga	RTU	Students training in Riga, 4 pers. x 3 universities., 14 days.		WP2	2022: Jan 17-28 th
P1	LV Riga	RTU	MC2, WS2: Workshops for curricula development. 2 persons x 4 days, all partners (<i>instead of meeting in November 15-16th 2021</i>)	MC1	WP2: WS2	2022: Jan 27-28 th EU- online, UA- in Riga
P2	BE Brugge	KU Leuven	Students training in Bruges, 4 pers., x 3 universities., 14 days.		WP2	2022: Feb.7-18 th
P3	CY Nicosia	UCY	Students training in Nicosia, 4 pers., x 3 universities., 14 days.		WP2	2022: Feb.28th— March 11th Was postponed due to warship
P8	UA	CPNU	WS3: devoted to implementation Quality Assurance Plan (WP5) in Chernihiv. 1 pers. X 4 days. All partners.		WS3: Quality WP5	Is merged with WS in March
P8	UA Chernihiv	CPNU, UCY QAP	WS6: 1) Developing the Sharing Modelling and Simulation Environment platform (SMSE) training. 2) Quality Assurance Plan (WP5) in Chernihiv 3 pers. X 4 days, all partners, <i>+2 days</i>	MC2	- WP4: WS6 SMSE - Quality WP5	2022: March 21-22 nd . Was arranged online on March 21 st
P9	UA Kharkov	KNAHU	Inform. session for stakeholders, Kharkiv. (only RTU – 1 pers. x 4 days.)		WP6: Dissemination	2022 April - Was postponed due to warship

P1	LV Riga	RTU	<p>Training of teachers in Riga: KNAHU, CPNU, KNU: 5 days, x 4 pers. KU Leuven, UCY: 5 days x 2 pers. ENERGYCON Riga 9-12 May 2022. <i>Training of teachers was replaced by a workshop.</i></p>	WP5 QA (External expert) MC; WP4-SMSE	WP2	2022: May 10-12 th Online
P9	UA Kharkov	KNAHU	<p>WS8: Workshops for curricula development, Double degree, Kharkov. 2 pers. X 4 days. All UA partners and RTU.</p>		WP2: WS8 devoted to DDMP	2022 May 19-20 th - Was postponed due to warship
P8	UA Chernihiv	CPNU	<p>Regional 3 days seminars – master classes in Chernihiv: - RTU, KU Leuven, UCY: 3 pers. x 5 days. - KhNAHU, KNU: 4 pers. X 5 days, +2 days</p>		WP2	2022 June 29 th - July 1 st - Was postponed due to warship
P2	BE Brugge	KU Leuven	<p>WS5: Workshop on innovative teaching methods & electronic environments, training. 2 pers. X 5 days, all partners.</p>	MC3	WP3: WS5 - ICT tools WS5	2022: July 4-6 th EU partners in Bruges, UA - online
P3	CY Nicosia	UCY	<p>WS4: Workshops for curricula development. QA reporting WS5. 2 persons x 5 days, all partners.</p>	MC4	WP2: WS4 /MC2	2022 September 19-21 st - hybrid format

P10	UA	KNU Kryvyj Rih	Final Conference: 2 persons x 4 days. All partners.		WP6: Disseminati on	2022 October 25- 26th. To be postponed due to extension of the project
P3	CY Nicosia	UCY	Students training in Nicosia, 4 pers., x 3 universities., 14 days.		WP2	3rd-17th of Oct, 2022 online or hybrid. Two weeks in Jan. - Febr. 2023?
P1	LV	RTU	MC and WS		WP2: WS7	March 16-17 th
P2	BE	KU Leuven	MC and WS		WP2, 3, and 4: WS10	April 13-14 th
P10	UA	KNU Kryvyj Rih	Final Conference: 2 persons x 4 days. All partners. - <u>Variant 1</u> : Final Conference: KNU , <i>Hybrid or Online format.</i> - <u>Variant 2</u> : RTU, Riga – for safety reason, hybrid format		WP6: Disseminati on	April 27-28 th 2023
			Project has been extended by May 14th 2023			

Further tasks and the next steps

- Students training in UCY, Nicosia, 4 pers., x 3 universities., 14 days, 3rd-17th of Oct, 2022 online or hybrid
 - Another option 2 weeks in January or February of 2023 is suggested by Ukrainian partners. UCY will give a proposal about the date of the Student's school.
- Ukrainian partners will submit a report about survey of industry representatives by September 30th
- Partners will send to CPNU the names of 1-2 persons for testing SMSE and creation of examples for own courses/labs by October 7th .
 - CPNU will arrange a seminar by the end of October.
- An updated schedule of training and workshops will be confirmed by partner by October 5th
- Ukrainian partners will publish all documents, which proof accreditation of courses and study programs in the e-Library of CybPhys.

Further tasks and the next steps

- RTU will elaborate available materials of e-books 4 and 9 in 2 single e-books.
- Ukrainian partners plans to finish accreditation of study programs and courses by the end of [April 2023](#).

Thank you for the questions!

The image features a clean, minimalist design. The background is white. In the bottom right corner, there is a decorative graphic consisting of several light blue lines that intersect to form a series of overlapping, irregular geometric shapes, resembling a stylized architectural or structural pattern. The lines are thin and have a consistent color.