Co-funded by the Erasmus+ Programme of the European Union

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

On-line preventive monitoring meeting
October 29th , 2020

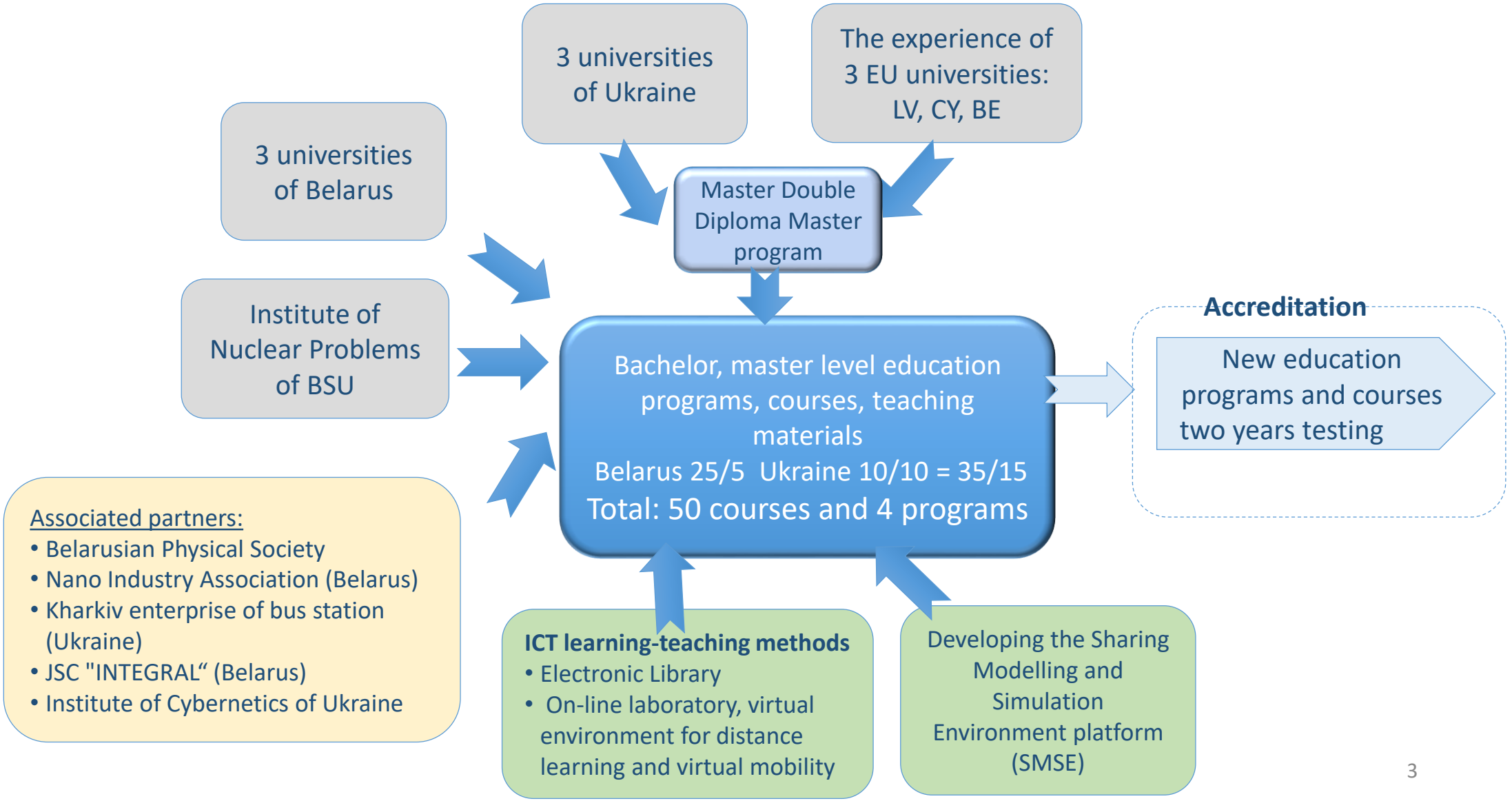
Dr.sc.ing. Anatolijs Zabašta
Project coordinator
Riga Technical University

Topics of my presentation

- The project targets
- The project progress
- Quality assurance issues
- Problem issues and suggestions

Project concept

Implementation: November 15th 2019 – November 14th 2022



Courses and programs: new / updated

- BSU: courses 11/2; Programs 1/1
- GSU: courses 10/2
- MSPU: courses 4/1
- CPNU: 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 : **50**
- Volume (in ECTS) of new/updated courses: **240**
- Number of planned learners enrolled per course delivery: **15**
- Expected number of students" to be trained: **420**
- Expected number of academic staff" to be trained: **120.**
- Expected number of "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**
  - students: **140**
  - non HEIs individuals: **16**
- % of the new curriculum planned to be taught in foreign language of the total of new curriculum developed by the project: 20%

Double Degree Master program development and accreditation: RTU - KNAHU

- To develop curriculum of the double-degree Master Program
- Bilateral Agreements between RTU – KhNAHU
- KhNAHU will accredit Double Degree master program at the Ministry of Science and Education
- RTU and KhNAHU start preparation to the student admission (practical arrangements, visa arrangement, etc.).

New teaching e-books
European value of EU-PCs cooperation

1. Bringing innovations to the market – RTU
2. Mathematical Modelling of Mechatronic Systems – KU Leuven
3. Model-oriented control in Intelligent Manufacturing Systems – CPNU
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)

Ukrainian consortium – very diligent team!

Chernihiv Polytechnic National University

- CPNU will develop, validate and accredit in the Ministry of Education and Science a new master program “Industrial Automation, update and accredit courses for existing bachelor program “Computer Systems of Automation”.
- It will develop and upgrade of the new courses, lectures, didactic materials, e-book.
- **Coordinating the e-book elaboration “Model-oriented control in Intelligent Manufacturing Systems”**
- It will purchase of hardware and software for creation new Virtual Automation Laboratory
- It will ensure master students flow for teaching in EU universities. The key teachers will be retrained at university of EU partners.
- It will develop dissemination and marketing materials
- Will involve region stakeholders:
- Will organize Ukraine stakeholders’ events, WS and MC meetings in Chernihiv.

Kharkiv National Automobile and Highway University

- Developing the training modules (standards) and curricula of the educational program “Electric Vehicles and Energy-Saving Technologies”;
- **Development of Double Degree master program with RTU** and accrediting the curricula and the training programs by the Ministry of Education and Science of Ukraine;
- **Coordinating the e-book elaboration “Cyber-Physical Systems for Clean Transportation”**.
- Training the teaching staff and Master’s students;
- Developing the lab “Laboratory of Energy-saving technologies in transport”.
- Arrangement of Ukrainian stakeholders’ events.
- Dissemination and exploitation activities concerning new training programs and courses.
- Arrangement of WS and MC meetings in Kharkiv.

Kryvyi Rih National University

- KNU is responsible for development of study programs of courses, developments of lecture courses, development of didactic materials.
- KNU will develop and accredit in the Ministry of Science and Education **the new educational program «Cyberphysical systems».**
- Acquisition a virtual /experimental labs and innovative ICT teaching methods and tools,
- New study courses and programs validation and accreditation;
- Teaching staff and students flow for training in EU universities.
- Arrangement of Ukrainian stakeholders' events in Kryvyi Rih. Dissemination and exploitation activities concerning new training programs and courses.
- Contribution to e-books elaboration by development course materials: "Cyber-Physical Systems for Clean Transportation".

Implementation:
Preparation tasks (WP1)

WP1 Deliverables and milestones

- The names of responsible for development of training programs and courses development were confirmed
- The table of the courses and credits is updated
- Partners elaborated Ex-Ante reports
- A survey of stakeholders was provided by Belarusian and Ukrainian partners was implemented. A Report with recommendation is created.
- Matrix of competences and profile of the CPS specialist is created in each PC university
- Workshop in Minsk (BSTU) on 10-11th, March 2020

Tenders for the equipment

Tenders for the equipment

- We should be aware of the fact that the procurement and delivery of equipment is often a rather complex procedure and this should be taken into consideration at the planning stage.
- Partners are responsible for arrangement of procurement procedure
- RTU will pay an advance to the partner, when gets the proof of successful tender

P4	BELARUSIAN STATE UNIVERSITY	Belarus	64 000
P5	FRANCISK SKORINA GOMEL STATE UNIVERSITY	Belarus	28 000
P6	Mozyr State Pedagogical University - MSPU	Belarus	28 000
P8	**Chernihiv National University of Technology**	**Ukraine**	**28 000**
P9	**Kharkiv National Automobile and Highway University - KhNAHU**	**Ukraine**	**32 000**
P10	**Kryvyi Rih National University - KNU**	**Ukraine**	**28 000**

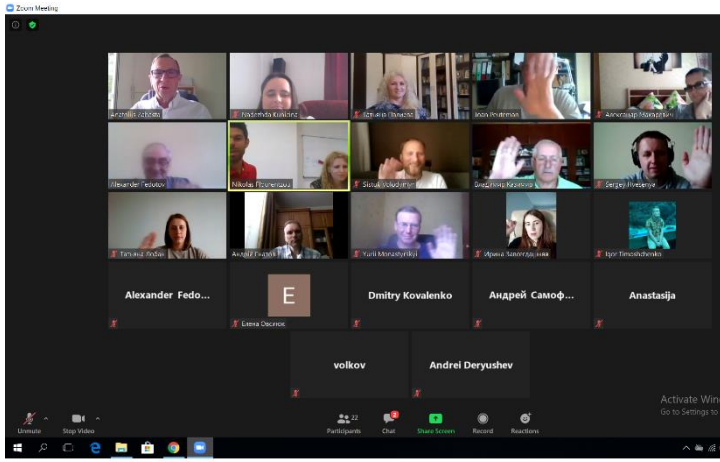
Equipment - KhNAHU

The problem issues

- A partners RANI (Belarus) left the consortium – incorporation of a new partner was finished in June 2020. *Delay!*
- Very slow accreditation of Belorussian consortium in the Government – still not finished yet. *Delay of purchase of equipment!*
- Covid-19 restrictions which prevent:
  - Travels for meetings
  - Travels for training
  - Restrictions on the dissemination events

How to resolve Covid-19 restrictions?

- Management meeting and WS – to on-line: July – December – monthly meeting at Zoom
- English language courses for teachers: have been postponed.
  - Three online sessions will be organized in January, February and March in 2021.
  - At site course (in Brugge) is postponed to September 2021
- Training courses for students and teachers in EU countries according to the Plan – at the 2nd part of the project
  - We will discuss at December meeting different alternatives of arrangement of the courses



How to keep motivation for Ukrainian partners?

- Involvement into Bologna process: recognition of curricula, new education programs and courses, ICT based teaching methods
- New equipment for laboratories and creation of Shared modelling and simulation platform
- Additional salaries for teachers, interpreters and professionals
- Opportunity for teachers and students to travel and create network of researchers, to improve English language skill.
- Intercultural exchange, etc.

How to keep motivation in the Covid-19 reality?

Virtualization of the training?

Development of innovative ICT based teaching and learning environment WP.3

- Development of virtual environments for distance learning and virtual mobility on the base of Moodle platform - Electronic Library
- Elaborating e-books, document sharing facilities, digital writing and publishing facilities.
- Development of learning and teaching methodologies and pedagogical approaches for use of ICT
- KU Leuven develops methodology for the e-book on “Cyber-physical systems for clean transportation” (as demonstration)
- The **KU Leuven** will show the possibilities of the use of a Virtual Learning Environment based on these course materials

BSU: Accreditation documents of education programs and courses

GSU: Accreditation documents of education programs and courses

MSPU: Accreditation documents of education programs and courses

CNUT: Accreditation documents of education programs and courses

KNAHU: Accreditation documents of education programs and courses

KRNU: Accreditation documents of education programs and courses

SYNOPSIS & LECTURES

Belarusian State University

Gomel State University

Mozyr State Pedagogical University

Chernihiv National Technological University

Kharkiv National Automobile and Highway University

Kryvyi Rih National University

DEVELOPMENT OF INNOVATIVE ICT BASED ELEARNING ENVIRONMENT

ICT based eLearning and teaching materials: demonstration of a Moodle based educational course

Instructional technical videos and presentations on ICT based learning during meetings

Educational example of a Moodle course

DEVELOPING THE SHARING MODELLING AND SIMULATION ENVIRONMENT PLATFORM

Development documents

Technical instructions

Learning and teaching materials

Sharing Modelling and Simulation Environment platform (WP4)

- Sharing Modelling and Simulation Environment platform for online, distance and virtual laboratory works for teaching of modelling and simulation of CPS.
- Analyses of experience of the contemporary technical solutions and development of a concept of the SMSE
- Development of the technical platform of the SMSE and designing of web interface.
- Development of computer classes with on-distance/ virtual laboratory
- Creation methodologies for implementing distance and virtual laboratory.

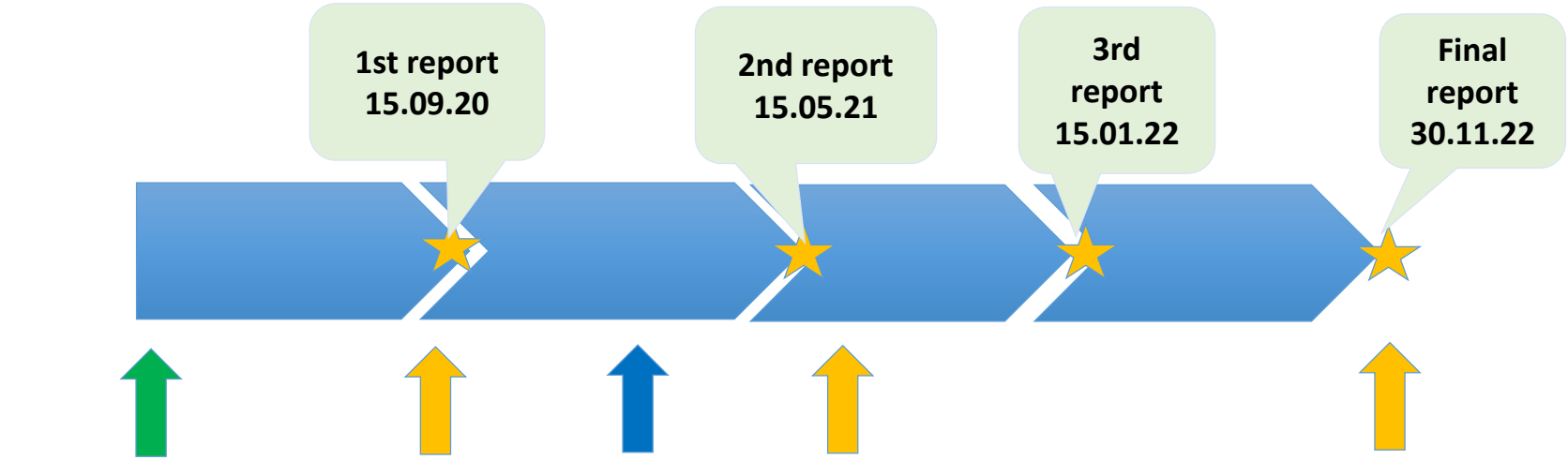
Topics for the future cooperation

- The CybPhys is not “overnight adventure”, but as a start for the future cooperation
- *Virtualization of teaching and learning* could be the topic of the next ERASMUS+ project
- However, it depends on how the consortium will implement the current CybPhys

WP 5 Quality Assurance:

University of Cyprus and RTU – quality of project implementation

Reporting & Progress monitoring



Intermediate reports (EACEA forms)

✓**Financial report**: Excel and evidences (timesheets, conventions, printing from bookkeeping system)

✓**Activities report** on the project progress against project plan, milestones and deliverables.

Quality Assurance Plan milestones

WP2 (D2.9)	**Partners' report on curricula development: development and enhancement of lectures, lab practices and compatible teaching (didactic) materials (lecture synopses, presentations, lab guides etc.)**	**14.08.21**
(D2.8)	**Partners reports on new curricula testing with feedback from teaching staff, students, Ministry' officers and entrepreneurs (professional associations, enterprises, etc.) involved in student teaching and curricula enhancement**	**15.01.22 14.06.22.**
(D5.4)	**Quality Reports from partners as well as Consolidated Quality Reports, produced by LP.**	**Presentations on Zoom meetings and reports by 15.01.22**
WP6 (D6.4)	**Survey and elaboration of recommendation obtained from associated partners and other stakeholders. A report with recommendations for new master-level program: introduction in PCs universities beyond the project.**	**14.11.22**
(D5.5)	**Reports on external experts on quality monitoring: Intermediate QA report Final QA report**	**14.11.22**

Problem issues due to Covid-19

- Travel cost saving due to Covid-19: is it recognised as a shortage of the project?
- Does it mean that the other parts of the budged must be reduced in order to keep 40 - 30% proportion?
- Is it possible to reallocate a part of saved travel cost in order to pay for additional job to the staff?

For example for e-learning training, teaching and learning materials development for e-learning?

Thank you for the questions!