



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
Belarusian NEO
December 10th 2020

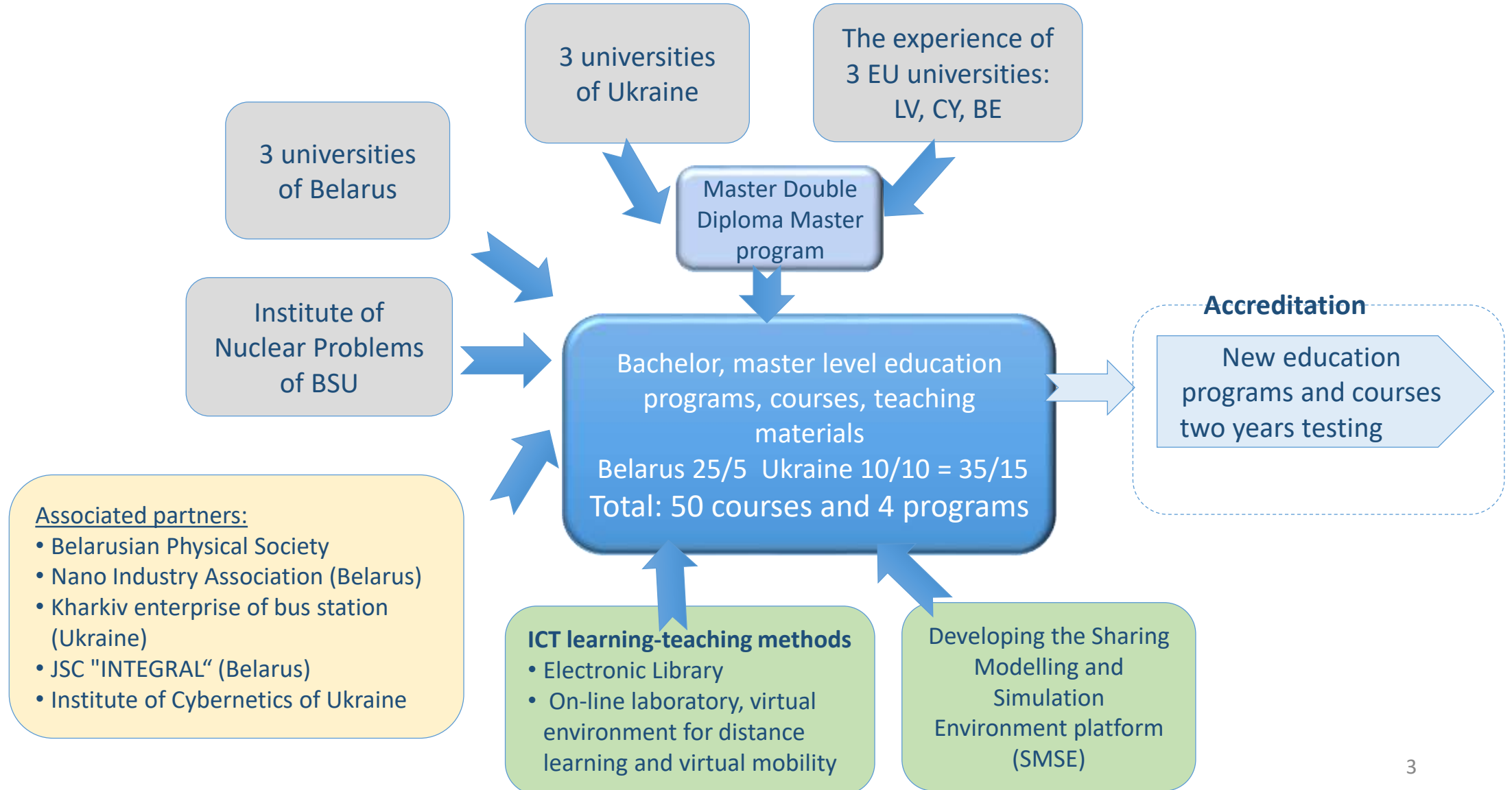
Dr.sc.ing. Anatolijs Zabašta
Project coordinator
Riga Technical University

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)

Implementation: **Preparation tasks (WP1)**

WP1 Deliverables and milestones

- The table of the courses and credits is updated and responsible for development of training programs and courses are nominated
- 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 and contractors

- 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

BELARUSIAN STATE UNIVERSITY	Belarus	Web design for e-Learning platform. Type - IT tool for teaching / learning. Specification - development, the coding of the website pages, the programming of the required software components, search & wiki engines, database	6 500.00
BELARUSIAN STATE UNIVERSITY	Belarus	Designing of SMSE platform: specification development, programming work using freeware, web interface design, the coding of the website pages, integration of the web interface, integration of new developed platform to the existing ICT infrastructure of BSU, programming of the required software components, database, users management, security issues.	10 500.00

Equipment - KhNAHU



Covid-19 impact

- 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 January meeting different alternatives of arrangement of the courses



How to keep motivation for Belarusian 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

e-Library

4th e-book Modern Mathematical Physics: Fundamentals and Application – BSU

БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

Разделы курса <

Участники

Компетенции

Оценки

Личный кабинет

Домашняя страница

Календарь

Мои курсы <

Личные файлы

cyberdocs

Basic information about E-book "Modern Mathematical Physics: Fundamentals and Application"

MATHEMATICAL INTRODUCTION

- Definite Integrals
- Delta function
- Special functions
- Improper integrals
- Multiple integrals

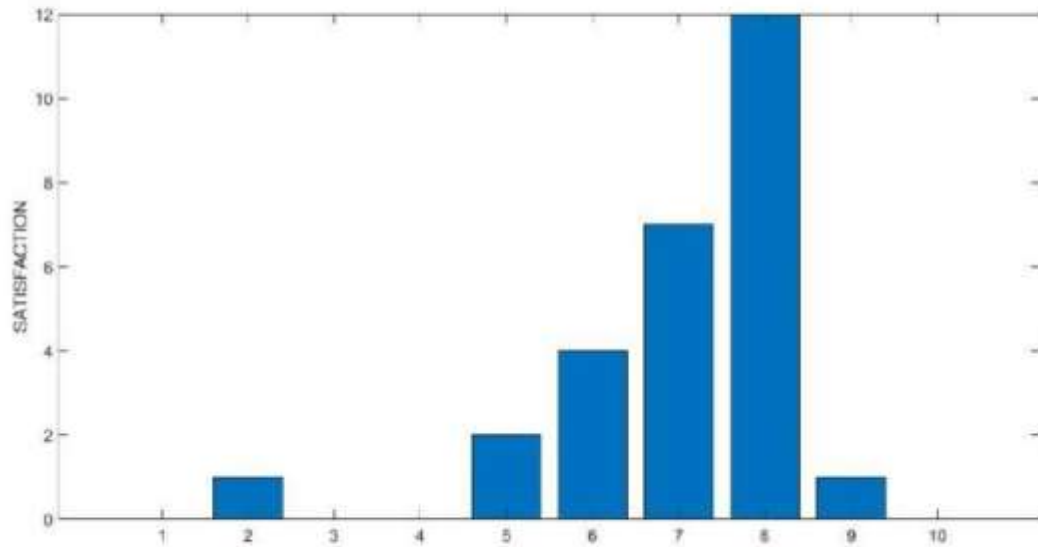
HEAT AND MASS TRANSFER

- Equations of heat and mass transfer
- Uniqueness of the solution of heat equation
- Heat transfer in a cylindrical domain
- Automodel solution
- Hierarchy of heat transfer models
- Green function method
- Operational method

Satisfaction of the teaching staff, KU Leuven

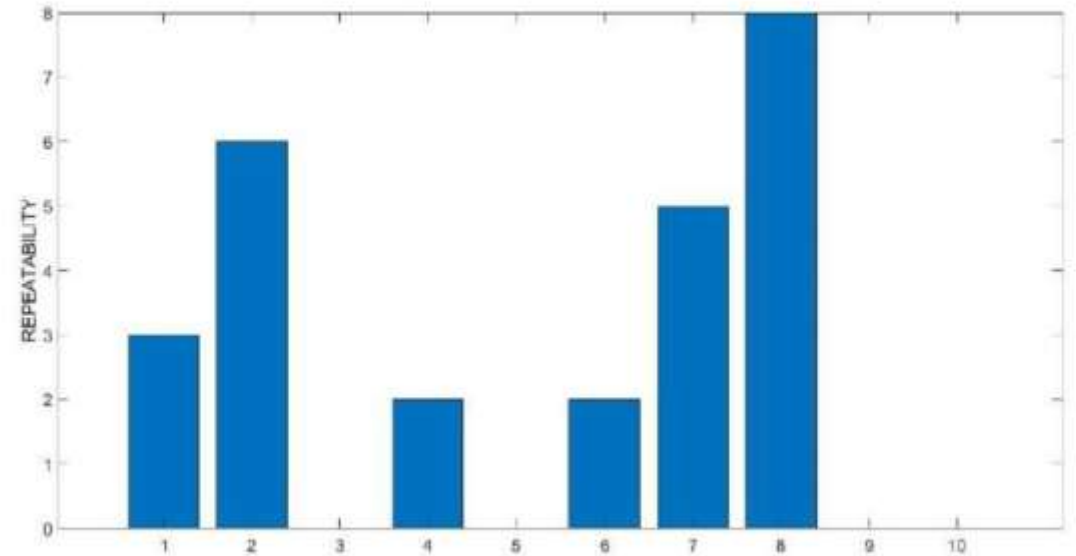
Satisfaction of the teaching staff

The global **satisfaction** among the teaching staff concerning the digital education approach is **quite high**:

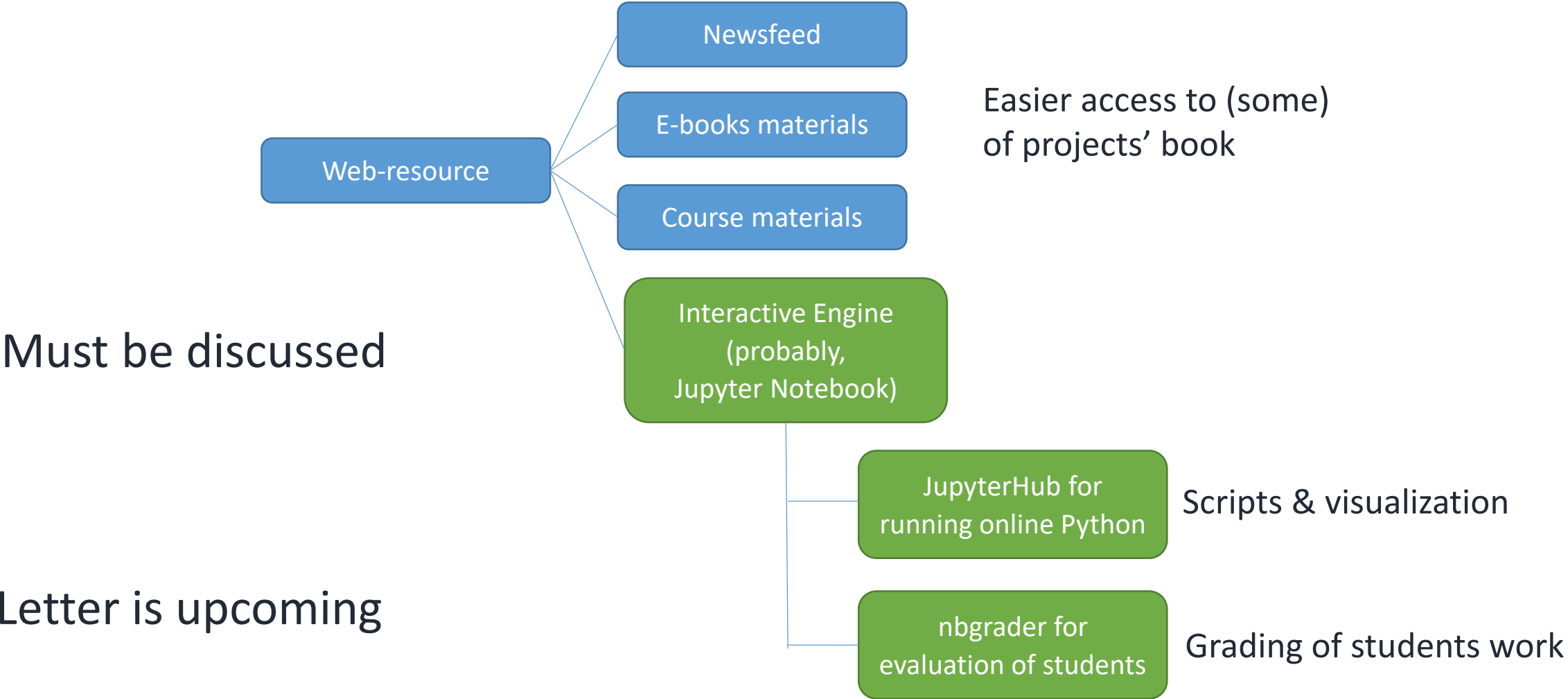


Satisfaction of the teaching staff

The **willingness to repeat** (entirely or partially) the digital education approach in “normal” situations is smaller.



Sharing Modelling and Simulation Environment platform (WP4)



Working Group on SMSE is created, 1st WS in January

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

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

<https://www.facebook.com/groups/227194018274534>




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Article

Research on Cross-Domain Study Curricula in Cyber-Physical Systems: A Case Study of Belarusian and Ukrainian Universities

Anatolijs Zabašta ^{1*}, Joan Peuteman ², Nadezda Kunicina ¹, Volodymyr Kazymyr ³,
Sergey Hvesenya ⁴, Andrii Hnatov ⁵, Tatsiana Paliyeva ⁶ and Leonids Ribickis ¹

15:15	15:30	<i>Anatolijs Zabašta (Riga Technical University, Latvia), Anatolijs Zabašta, Joan Peuteman, Nadezda Kunicina, Lyudmyla Kruhlenko, Dmitry Kovalenko and Anastasia Zhiravetska "Approach for Cross-Domain Study Curricula in Cyber-Physical Systems for Belarusian and Ukrainian Universities" (33)</i>
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Problem issues

- Is it possible to reallocate a part of **saved travel cost** in order to pay for **additional job to the staff**?

Regarding your question about unspent travel costs, they will have to be refunded to the Agency. I am afraid we do not see any reason why staff costs should increase because of Covid-19.

- **Very slow accreditation of CybPhys** in the Belorussian Government' institutions – still not finished yet!
 - ✓ Delay of purchase of equipment!
 - ✓ Cause motivation of Belarusian team members
 - ✓ In the middle of 2021 EU and Ukrainian partners will **run off money**!
 - ✓ High risk that the Grant **will be reduced** due to low acquisition of funds!
 - ✓ High risk that the project **will be delayed**

Thank you for the questions!

