TeComp

WORKSHOP ON THE SUSTAINABILITY OF THE PROJECT RESULTS

- PROCEEDINGS -

SEPTEMBER 2022

www.tecomp.ni.ac.rs
tecomp@ni.ac.rs
tecomp.p2018@gmail.com

Project acronym:	TeComp
Project full title:	Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences
Project No:	598434-EPP-1-2018-1-RS-EPPKA2-CBHE-JP
Number of grant contracts	2018-2467/001-001
Web address of project	www.tecomp.ni.ac.rs
Funding Scheme:	Erasmus+
Coordinator Institution:	University of NIš
Coordinator:	Prof. dr Jelena Ignjatović
Project duration:	15.11.2018. – 14.11.2022.
Work package:	WP3 – Professional development of teaching staff
Task leader:	University of Nis
Date:	10. 9. 2022
Version of the document:	Final
Status:	
Dissemination level:	External

Moderators:

Sladjana Dimitrijevic
Ana Kaplarevic- Malisic
Jelena Ignjatovic
Jelena Matejic
Tatjana Andjelkovic

Table of Contents

ABOUT TECOMP - INTRODUCTION 5

TECOMP PROJECT TEAM 7

University of Niš **9**

University of Belgrade **10**

University of Novi Sad **11**

University of Kragujevac **13**

Eqrem Çabej University Gjirokastër **14**

Fan S. Noli University Korce **15**

University of Oviedo **16**

Matej Bel University in Banska Bystrica **17**

Ghent University **19**

University of Granada **20**

University of Ostrava, Czech Republic **20**

SUSTAINABILITY 22

CENTER FOR PROFESSIONAL DEVELOPMENT OF TEACHING STAFF AT UNI AND CENTER FOR LIFELONG LEARNING AT UNIKG 23

MATERIAL FOR SHORT-CYCLE CPD COURSE CONDUCTED BY UGENT 25

DESCRIPTION OF MAIN DELIVERABLES 26

Sustainability – Curriculum Development **26**

THE MODERNIZED COURSES PUBLISHED ON THE LEARNINGKEY PLATFORM 38

Sustainability – CDP (LLL) **43**

Sustainability – Teaching/Training Matherial **44**

Sustainability – Learning platforms **52**

LearningKey platform **52**

Platform for peer evaluation **53**

Systems for electronic testing **54**

Sustainability – Future Cooperation **55**

About TeComp - Introduction

In the past fifthteen years, Serbia and Albania have gone through a comprehensive reform of the higher education system aimed at its harmonization with the Bologna principles and the full integration into the European educational framework. As a reform outcome, in the field of natural and mathematical sciences modern study programs have been created with contents that strictly follow the European and world standards. However, the changes made in the way of studying and modernization of study programs have not sufficiently been accompanied by adequate changes in the way of teaching and learning, and we are faced with the continuation of reforms, which should be accomplished through the modernization of teaching and learning.

According to the report on New modes of learning and teaching in higher education, submitted by the European Union's High-Level Group on the Modernisation of Higher Education to the European Commission in October 2014, and the report on Improving the quality of teaching and learning in Europe's higher education institutions, submitted by the same group in June 2013, the main task of European governments in the modernization of higher education is to strongly encourage and support a greater integration of new technologies and appropriate pedagogical approaches in conventional education. It was also pointed out that comprehensive strategies for the adoption of new modes of learning and teaching within higher education have to be developed at both the national and institutional level, and the main proponent of changes should be the teaching staff of these institutions. To be up to the task, the teaching staff must possess the knowledge and skills to allow them to fully utilise the range of new teaching tools available. Consequently, continual professional development for teaching staff must become the imperative across all higher education institutions.

TeComp project strictly follows the initiative and recommendations of the European Union's High-Level Group on the Modernization of Higher Education (HLG) and consistently apply them in the modernization of teaching and learning in the field of natural and mathematical sciences at six higher education institutions in Serbia and Albania. The first general task of the project was the continual professional development of university teaching personnel in the field of natural and mathematical sciences. It was organised continual professional development of the teaching staff in pedagogy and methodology of teaching, it order to gain new knowledge about the basic pedagogical principles in the higher education, and the specifics of teaching and learning in the field of natural and mathematical sciences, thereby raising the level of their teaching competencies and skills. In view of HLG's recommendations, special attention was paid to pedagogical and methodological aspects of the use of ICT in teaching and learning, as well as to training in the use of new educational technologies. To stimulate internationalization, it was also organised the training of teachers for teaching and academic writing in English. Along with all these forms of training we worked on raising awareness about the necessity of modernizing teaching and learning through the integration of new technologies and relevant pedagogy. In order to demonstrate the benefits it brings both to teachers and students and also because of living conditions during Covid epidemy, we launched several pilot courses for the integration of online

technologies and pedagogies within courses. At our institutions we also develop and implement strategies for the support and on-going improvement of the quality of teaching and learning, especially for the adoption of new modes of learning and teaching.

The main objective of TeComp project was improvement of the quality of higher education in the field of natural and mathematical sciences at higher education institutions in Serbia and Albania in line with advance EU practices, thereby enhancing their comparability and competitiveness in Europe and beyond. This wider aim was achieved through completion of the set of specific objectives concerned with the areas where the measures were applied:

- enhanced professional competences and skills of teaching staff through training courses in contemporary pedagogical approaches, methodologies and educational technologies;
- upgraded educational infrastructure as a basis for wider integration of modern pedagogical principles and technologies in teaching and learning;
- delivered new/modified courses in psychology, pedagogy, methodology of teaching, and technology enhanced learning at the PC HEIs in line with the modern European strategies;
- strengthened personnel infrastructure through the introduction of continuous professional development in the system of higher education.

According to these objectives, we achieved the following outcomes:

- Identified and adopted the necessary measures and actions required for quality enhancement of teaching and learning processes;
- Upgraded educational infrastructure;
- Organized trainings of teaching staff for harnessing pedagogical and methodological principles and new modes of teaching and learning;
- Developed methodology and platforms for wider integration of ICT in teaching and learning.

The project was particularly focused on the transition from a teaching-oriented to learning-oriented approach to the learning process, a flexible approach and individualization, as well as better communication and interaction between teachers and students.

TeComp project team

Project team consists of 11 members, 6 universities from partner counties (Serbia and Albania) and 5 universities from program counties (Spain, Slovak Republic, Belgium, Czech Republic).

- Partner 1 – University of Niš (UNI), Serbia
- Partner 2 – University of Belgrade (UB), Serbia
- Partner 3 – University of Novi Sad (UNS), Serbia
- Partner 4 – University of Kragujevac (UNIKG), Serbia
- Partner 5 – Eqrem Çabej University Gjirokastër (ECUG), Albania
- Partner 6 – Fan S. Noli University Korce (UNIKO), Albania
- Partner 7 – University of Oviedo (UNIOVI), Spain
- Partner 8 – Matej Bel University in Banska Bystrica (UMB), Slovak Republic
- Partner 9 – Ghent University (UGENT), Belgium
- Partner 10 – University of Granada (UGR), Spain
- Partner 11 – University of Ostrava (UO), Czech Republic

The Serbian universities, involved in this project, have a long tradition of education in the field of natural and mathematical sciences (NMS) and a strong educational and scientific base in this field. For that reason, their participation has a crucial importance for the project. General problems that occur in teaching and learning in the field of NMS are common for all these universities, and they are well motivated and determined to solve them together. The project teams from UB, UNS, UNI, and UKG consist of experts in the field of NMS, some of whom are engaged in methodology of teaching and experts in the field of educational sciences. These teams have great experience in the realization of EU projects, some of them, they have implemented together and that also contribute to the success of this project. In particular, together they realized the TEMPUS project Science Teacher Education Revision and Upgrading. The UNI staff who coordinated this project has participated in several Tempus projects and they have experience in the coordination and management of such projects. To achieve the regional dimension of the project, two universities from Albania, ECUG and UNIKO, with the same problems as Serbian universities, are also included. UNIKO has great experiences with EU projects and ECUG had experience in Tempus projects and it was recently included in Erasmus+ project TEAVET. The teams from ECUG and UNIKO consist of the experts in the field of NMS and educational sciences. Definitely, this project enabled strengthening cooperation between Albanian and Serbian universities.

EU partners were selected according to the needs of the project, too. Teams from UNIOVI and UMB have excellent mutual connections, and together they have already had succesful cooperation with Serbian teams on many projects. In addition, the team from UNIOVI has excellent professional cooperation both with UGENT and UGR. The teams from UNIOVI, UMB and UO consist of experts in the field of NMS and ICT experts, some of whom deal with the methodology of teaching in different areas of NMS. Teams from UGENT and UGR consist of

experts in educational sciences and they are complementary to other partners, so their expertise was of crucial importance.

At the end of project we are very sure that we will cooperate in future in similar projects about improvement of HE, but also in other areas. During the workshop all partners together made and agreed to sing as the base for future cooperation.

Figure 1. Fotography of TeComp team on Kick of mitting

Contact persons and Key staff members of each partner institution are listed below.

University of Niš

Dr DRAGAN ANTIĆ, RECTOR, Full Professor
Institution: University of Niš, Faculty of Electronic Engineering
E-mail: rektor@ni.ac.rs
Research field and areas: Modeling and Simulation, Control systems, Sliding Mode Control

Dr Jelena Ignjatović, Assistant Professor
Institution: University of Niš-Faculty of Sciences and Mathematics
E-mail: jelena.ignjatović@pmf.edu.rs
Research field and areas: Theoretical Computer Science –Fuzzy Set Theory, Fuzzy automata theory, Ordered sets and lattices, Social Networks, Data Analysis

Dr Miroslav Ćirić, Full Professor
Institution: University of Niš, Faculty of Sciences and Mathematics
Address: Višegradska 33, 18000 Niš
Telephone: +381638912842
E-mail: miroslav.ciric@pmf.edu.rs
Research field and areas: Mathematics and Computer Science – Semigroup Theory, Ordered Algebraic Structures, Fuzzy Set Theory, Linear and Multilinear Algebra, Matrix Theory, Mathematical Logic, Social Networks, Theory of Computing, Data Analysis

Jelena Matejić, Assistant
Institution: University of NIš - Faculty of Science and Mathematics
Address: Višegradska 33, 18000 Niš
Telephone: +381643562664
E-mail: jelena.matejic@pmf.edu.rs
Research field and areas: Computer Science

Dr Tatjana Anđelković, Full Professor
Institution: University of Niš, Faculty Science and Mathematics,
E-mail: tatjana.andjelkovic@outlook.com
Research field and areas: Environmental chemistry; Environmental and food safety control; Teaching chemistry methodlogy

Dr Aleksandra Arsenijević, Associate for finance on projects
Institution: University of Niš
Address: Univerzitetski trg 2, 18000 Niš
Telephone: +38118257089
E-mail: aleksandra@ni.ac.rs
Research field and areas: Accounting, Auditing and Financial Management

University of Belgrade

Dr Sinisa Djurasevic, Full Professor
Institution: University of Belgrade-Faculty of Biology
Address: Studentski trg 3, 11000 Belgrade
Telephone: +381648237956
E-mail: sine@bio.bg.ac.rs
Research field and areas: Physiology, Metabolism, Pharmacology, Care and use of laboratory animals

Dr Andrijana Zekic, Full Professor
Institution: University of Belgrade-Faculty of Physics
Address: Studentski trg 16, 11000 Belgrade
Telephone: +381604469449
E-mail: andrijana@ff.bg.ac.rs
Research field and areas: Physics - Condensed Matter Physics - Physics of Crystal Growth.
Physics Education

Dr Miroslav Maric, Full Professor
Institution: University of Belgrade-Faculty of Mathematics
Address: Studentski trg 16, 11000 Belgrade
Telephone: +381648650111
E-mail: maricm@matf.bg.ac.rs
Research field and areas: Artificial Intelligence, Teaching Methodology in Mathematics and Computer Science, Operational Research, Credit Risk, Mathematical Optimization, Parallel Algorithms

Dr Nebojsa Jasnic, Associate Professor
Institution: University of Belgrade-Faculty of Biology
Address: Studentski trg 3, 11000 Belgrade
Telephone: +381648237940
E-mail: jasnicn@bio.bg.ac.rs
Research field and areas: Physiology, Endocrinology, Metabolism

University of Novi Sad

Dr Andreja Tepavčević, Full Professor
Institution: University of Novi Sad-Faculty of Science
Address: Trg Dositeja Obradovića 4, 21000 Novi Sad
Telephone: +381637478273
E-mail: andreja@dmi.uns.ac.rs
Research field and areas: Mathematics, Algebra, Universal Algebra and Lattice Theory, Fuzzy Set Theory and Applications

Dr Zorana Lužanin, Full Professor
Institution: University of Novi Sad-Faculty of Science
Address: Trg Dositeja Obradovića 4, 21000 Novi Sad
Telephone: +381638697179
E-mail: zorana@dmi.uns.ac.rs
Research field and areas: Optimization, Mathematical and Statistical modeling, Education-Teaching of mathematics

Dr Goran Radojev, Associate Professor
Institution: University of Novi Sad-Faculty of Science
Address: Trg Dositeja Obradovića 4, 21001 Novi Sad
Telephone: +381641698992
E-mail: radojev@dmi.uns.ac.rs
Research field and areas: Numerical analysis, Numerical methods for ODEs and PDEs, Computational mathematics.

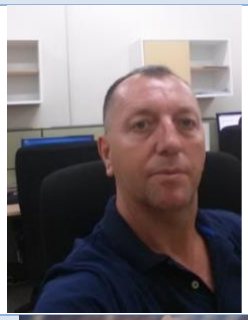
Dr Jasna Atanasijevic, Associate Professor
Institution: University of Novi Sad-Faculty of Science
Address: Trg Dositeja Obradovića 4, 21102 Novi Sad
Telephone: +381637724131
E-mail: jasna.atanasijevic@dmi.uns.ac.rs
Research field and areas: Empirical economics, Governance, Public policy analysis, Applied econometrics.

MSc. Đurica Salamon, Secretary of Department of Mathematics and Informatics
Institution: University of Novi Sad-Faculty of Science
Address: Trg Dositeja Obradovića 4, 21102 Novi Sad
Telephone: +381648900559
E-mail: djurica.salamon@dmi.uns.ac.rs
Research field and areas: administrative staff, Applied statistics

University of Kragujevac

Dr Srećko Trifunović, Full Professor
Institution: University of Kragujevac-Faculty of Science
Address: Radoja Domanovića 12, 34000 Kragujevac
Telephone: +381648150052
E-mail: srecko.trifunovic@pmf.kg.ac.rs
Research field and areas: Inorganic chemistry

Dr Slađana Dimitrijević, Assistant Professor
Institution: University of Kragujevac-Faculty of Science
Address: Radoja Domanovića 12, 34000 Kragujevac
Telephone: +381642019676
E-mail: sladjana.dimitrijevic@pmf.kg.ac.rs
Research field and areas: Stochastics, Fractional differential equations, Fix point theory, Mathematics Education and Teaching Methodology in
Mathematics



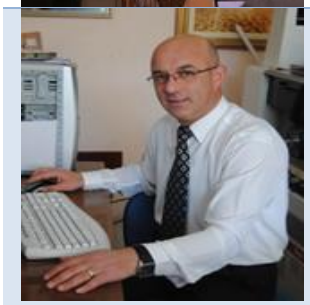
Dr Milan Kovačević, Full Professor
Institution: University of Kragujevac-Faculty of Science
Address: Radoja Domanovića 12, 34000 Kragujevac
Telephone: +381637746648
E-mail: milan.kovacevic@pmf.kg.ac.rs
Research field and areas: Applied optics and photonics, Plasma physics, Physics Education, Biophysics.

Dr Ana Kaplarević Mališić, Assistant Professor
Institution: University of Kragujevac-Faculty of Science
Address: Radoja Domanovića 12, 34000 Kragujevac
Telephone: +381642968444
E-mail: ana.kaplarevic@pmf.kg.ac.rs
Research field and areas: Computer Science, High-performance computing, Computer modeling and simulation, Teaching Methodology in Computer Science.

Dr Ivana Radojević, Assistant Professor
Institution: University of Kragujevac-Faculty of Science
Address: Radoja Domanovića 12, 34000 Kragujevac
Telephone: +381 34336223 loc. 273
E-mail: ivana.radojevic@pmf.kg.ac.rs
Research field and areas: Microbiology, Microbial ecology, Bioremediation, Methodology of scientific research.

Eqrem Çabej University Gjirokastër

Luiz Seiti, Head of IRO
Institution: "Eqrem Cabej"University of Gjirokastra-International Relations and Scientific Research Office
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Research field and areas: English teaching, Accounting & Finance, PhD candidate in English language



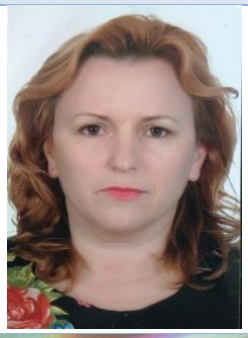
Dr Romeo Mano, Full Professor
Institution: "Eqrem Cabej"University of Gjirokastra-Faculty of Natural Science
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355695435906
E-mail: manoromeo2002@yahoo.com
Research field and areas: Mathematics, Statistics, Probability, Applied Mathematics, Teaching Methodology and Pedagogy in the field of Mathematics

Dr Isidor Kokalari, Full Professor
Institution: "Eqrem Cabej"University of Gjirokastra-Faculty of Natural Science
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355684015599
E-mail: isidorkokalari@yahoo.com
Research field and areas: Biophysics. Non ionizing radiation of mobile telephony, Modelling of cardiovarcular system, Methodology and Pedagogy of teaching of Physics

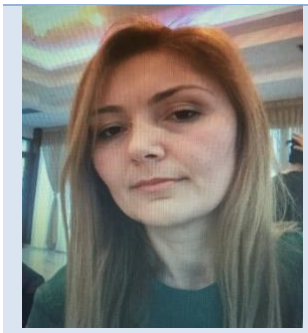
Dr Dhori Terpo, Full Professor
Institution: "Eqrem Cabej"University of Gjirokastra-Faculty of Natural Science
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355697263868
E-mail: dhterpo@uogj.edu.al
Research field and areas: Informatics, e-Governing, Data mining

Dr Antuela Sinani, Full Professor
Institution: "Eqrem Cabej"University of Gjirokastra-Faculty of Natural Science
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355695740747
E-mail: asinani@uogj.edu.al
Research field and areas: Measurement of ionizing and non-ionizing radiation, Acoustic pollution

Dr Mimoza Carka, Full Professor
Institution: "Eqrem Cabej"University of Gjirokastra-Faculty of Social Sciences
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355694285836
E-mail: mcarka2001@yahoo.com
Research field and areas: Pedagogy and Psychology, Motivation and productivity, Diversity and communication in the classroom, Inclusion in education, Curriculum development, Assessment in education



Dr Loreta Mamani, Full Professor
Institution: "Eqrem Cabej"University of Gjirokastra-Faculty of Social Sciences
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355694640798
E-mail: loretamamani@hotmail.com
Research field and areas: Psychology-Pedagogy Clinical Psychology, Education



Irma Gjolleshi, Head of IRO
Institution: "Eqrem Cabej"University of Gjirokastra -Inernational Relations and Scientific Research Office
Address: Lagjja "18Shtatori", Rruga Studenti, 6002
Telephone: +355693336284
E-mail: igjolleshi@uogj.edu.al
Research field and areas: TESOL Methodology, Integration of Critical thinking in the Exploration of Cultures in areas where English is spoken as a second language

Fan S. Noli University Korce

Dr Lorenc Ekonomi, Full Professor
Institution: University of Korça-Faculty of Nature and Human Sciences
Address: Godina e ish Divizionit, 7001, Korça, ALBANIA
Telephone: +355692300600
E-mail: lekonomi@unkorce.edu.al
Research field and areas: Statistics, Probability, Mathematical Analysis

MSc. Silvja Çobani
Institution: University of Korça, - Faculty of Natural and Human Sciences
Address: Bulevardi Rilindasit, 11, Korçë
Telephone:+355676395130
E-mail: scobani@unkorce.edu.al
Research field and areas: Metric Spaces, Discrete Mathematics, Probability, Statistics

Msc. Denisa Kafazi
Institution: University of Korça, - Faculty of Natural and Human Sciences
Address: Bulevardi Rilindasit, 11, Korçë
Telephone:+355696506715
E-mail: dkafazi@unkorce.edu.al
Research field and areas: Algebra, Education- Teaching of mathematics

Msc. Ardian Cerava
Institution: University of Korça, - Faculty of Argiculture
Address: Bulevardi Rilindasit, 11, Korçë
Telephone:+355694319772
E-mail: acerava@unkorce.edu.al
Research field and areas: IRO, Environmental Economics, Econometrics, Farm Management

University of Oviedo

Dr. Luis J. Rodríguez-Muñiz, Full Professor
Institution: University of Oviedo, Department of Statistics & OR and Mathematics Education
Address: Facultad de Geología 5.7. c/Jesús Arias de Velasco s/n. 33005 Oviedo
Telephone: +34985103126
E-mail: luisj@uniovi.es
Research field and areas: Mathematics Education, Statistics Education, Mathematics Teacher Training

Dr. Laura Muñiz-Rodríguez, Assistant Professor
Institution: University of Oviedo, Department of Statistics & OR and Mathematics Education
Address: Facultad de Geología 5.16b. c/Jesús Arias de Velasco s/n. 33005 Oviedo
Telephone: +34985103377
E-mail: munizlaura@uniovi.es
Research field and areas: Mathematics Education, Statistics Education, Mathematics Teacher Training

Noelia Rico Pachón, Researcher
Institution: University of Oviedo, Department of Computer Science
Address: Facultad de Geología 5.16b. c/Jesús Arias de Velasco s/n. 33005 Oviedo
Telephone: +34985103154
E-mail: noeliarico@uniovi.es
Research field and areas: Aggregation methods in machine learning, application for data analysis in real problems.

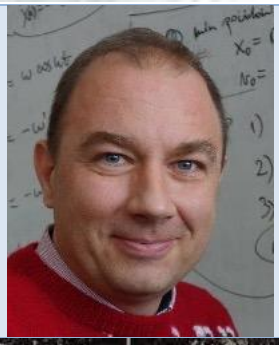
Dr. Irene Díaz, Full Professor
Institution: University of Oviedo, Department of Computer Science
Address: Facultad de Geología 4.0. c/Jesús Arias de Velasco s/n. 33005 Oviedo
Telephone: +34985102953
E-mail: sirene@uniovi.es
Research field and areas: Fuzzy sets extensions, Data privacy with fuzzy partitions, Edge detection in image processing, Fuzzy preference relations in human reliability.

Matej Bel University in Banska Bystrica

Dr Vladimír Janiš, Full Professor
Institution: Matej Bel University, Faculty of Science, Banská Bystrica
Address: Tajovského 40, 974 01 Banská Bystrica, Slovak Republic
Telephone: +421948998759
E-mail: vladimir.janis@umb.sk
Research field and areas: Mathematics, Fuzzy set theory, Aggregation functions

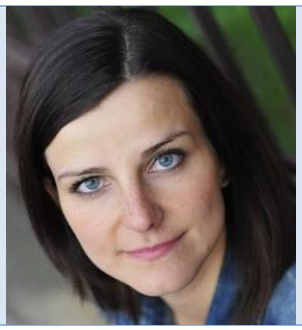
Dr Ingrid Turisová, Assoc. Professor
Institution: Matej Bel University, Faculty of Science, Banská Bystrica
Address: Tajovského 40, 974 01 Banská Bystrica, Slovak Republic
Telephone: +4214467406
E-mail: ingrid.turisova@umb.sk
Research field and areas: Plant ecology, Management of biotopes, thematical and Statistical modeling, Plants population biology

Dr Katarína Trnková, Assistant Lecturer
Institution: Matej Bel University, Faculty of Science, Banská Bystrica
Address: Tajovského 40, 974 01 Banská Bystrica, Slovak Republic
Telephone: +4214467224
E-mail: katarina.trnkova@umb.sk
Research field and areas: limnology, paleolimnology, protozoology, parasitology



Dr Boris Tomášik, Full Professor
Institution: Matej Bel University, Faculty of Science, Banská Bystrica
Address: Tajovského 40, 974 01 Banská Bystrica, Slovak Republic
Telephone: +4214467206
E-mail: boris.tomasik@umb.sk
Research field and areas: Phenomenology of ultrarelativistic nuclear collisions, Education of Physics.

Dr. Alžbeta Michalíková, Assist. Lecturer
Institution: Matej Bel University, Faculty of Science, Banská Bystrica
Address: Tajovského 40, 974 01 Banská Bystrica, Slovak Republic
Telephone: +4214467129
E-mail: alzbeta.michalikova@umb.sk
Research field and areas: Computer science, Processing of imprecise information



Mgr. Viera Pavlovičová, administrative assistant
Institution: Matej Bel University, Rectorate, Banská Bystrica
Address: Národná 12, 974 01 Banská Bystrica, Slovak Republic
Telephone: +4214467439
E-mail: viera.pavlovicova@umb.sk
Research field and areas: administrative support of international projects

Ghent University

dr. Martin Valcke, Full professor
Institution: Ghent University, Faculty of Psychology and Educational Sciences, Department of Educational Studies
AH. Dunantlaan 2 B9000 Gent , Belgium
Telephone: +32 (0)9 264 8675/6251
E-mail: martin.valcke@ugent.be
Research field and areas: Innovation Higher Education, Performance indicators, Professional Development, Change Management
http://orcid.org/0000-0001-9544-4197

Dr Britt Adams, Scientific Researcher
Institution: Ghent University, Faculty of Psychology and Educational Sciences, Department of Educational Studies
AH. Dunantlaan 2 B9000 Gent , Belgium
Telephone: +32 (0)9 264 6251
E-mail: britt.adams@ugent.be
Research field and areas: Professional Development, Higher Education research
https://orcid.org/0000-0003-2478-8755

Maxime Moens, Scientific Researcher
Institution: Ghent University, Faculty of Psychology and Educational Sciences, Department of Educational Studies
AH. Dunantlaan 2 B9000 Gent , Belgium
Telephone: +32 (0)9 264 6251
E-mail: britt.adams@ugent.be
Research field and areas: Professional Development, Strategic Human Resource Management
https://orcid.org/0000-0003-3208-4256

University of Granada

Dr María C. Cañadas, Full Professor
Institution: University of Granada-Faculty of Science Education
Address: Campus de la Cartuja, s/n. 18071 Granada
Telephone: +34 958249621
E-mail: mconsu@ugr.es
Research field and areas: Mathematics education, mathematics teacher training, algebraic thinking, numerical thinking, teaching and learning mathematics at the childhood education, teaching and learning mathematics at the elementary education.

Dr Antonio Moreno, Assistant Professor
Institution: University of Granada-Faculty of Science Education
Address: Campus de la Cartuja, s/n. 18071 Granada
Telephone: +34 958249635
E-mail: amverdejo@ugr.es
Research field and areas: Mathematics education, mathematics teacher training, algebraic thinking, teaching and learning mathematics at high education.

University of Ostrava, Czech Republic

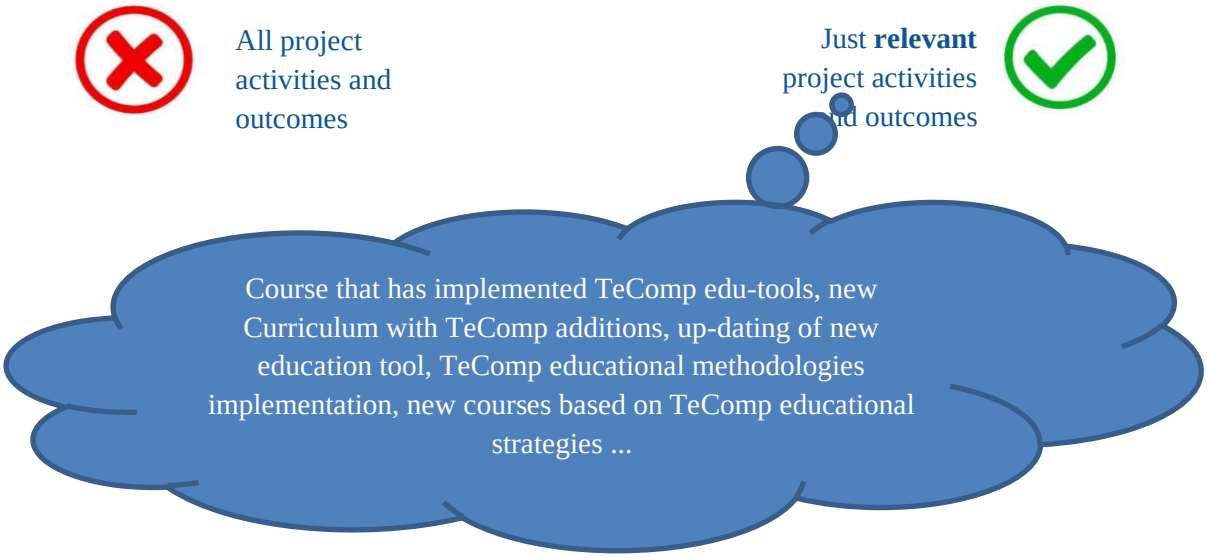
Prof Irina Perfilieva, Full Professor
Institution: University of Ostrava
Address: Dvořákova 7, 70103 Ostrava
Telephone: +420553461408
E-mail: irina.perfilieva@osu.cz
Research field and areas: Mathematics, Fuzzy Transform, Fuzzy Topology, Image Processing, Computer Graphics

Dr Petra Murinová, Associate Professor
Institution: University of Ostrava
Address: Dvořákova 7, 70103 Ostrava
Telephone: +420553461407
E-mail: petra.murinova@osu.cz
Research field and areas: Mathematics, Natural Fuzzy Logic, Partial Fuzzy Logic, Fuzzy Association Analysis

Dr Martin Dyba, Assistant Professor
Institution: University of Ostrava
Address: Dvořákova 7, 70103 Ostrava
Telephone: +420553461407
E-mail: martin.dyba@osu.cz
Research field and areas: Mathematics, Fuzzy Modelling, Fuzzy Sets, Fuzzy Logic

Sustainability

A project is sustainable when it continues to deliver benefits to the project beneficiaries and/or other constituencies for an extended period after the Commission's financial assistance has been terminated (from *Sustainability of international cooperation projects in the field of higher education and vocational training: Handbook on Sustainability. Luxembourg: European Commission Directorate-General Education and Culture*, 2006.).



How to describe the sustainability of Tecomp project?

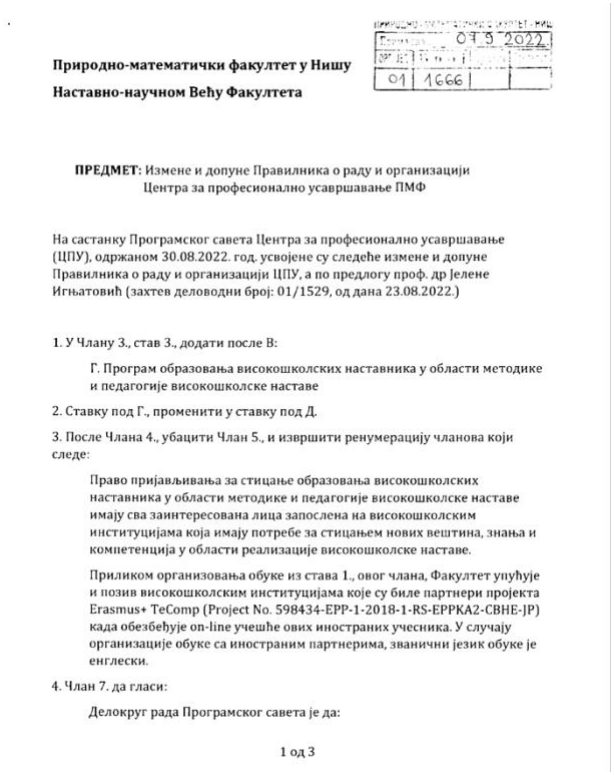
A practical way to describe achieved sustainability of TeComp project is to use the following two criteria:

1. **Diversity and intensity of activities/outputs maintained or developed after the end of the funding of TeComp:**
   - Activities/outputs are developed.
   - Activities/outputs are maintained. - New accreditation procedures set through TeComp are implemented (activities) / a curriculum set through TeComp is still used (outputs)
   - Activities/outputs can be disseminated. - Creation of a web site presenting e-learning sessions and courses and CPD courses (activities) / Curriculum developed is included in existing courses in universities which do not belong to the initial consortium (outputs)
2. **Intensity and enlargement of the cooperation:**

- The international network is maintained - partners take care of the follow-up: „AGREEMENT on educational, scientific and technical cooperation“
- The local network is maintained - the universities meet regularly with the private local firms, companies, schools, etc. concerned.
- The initial network can be enlarged to incorporate other domains or entities.

Center for professional development of teaching staff at UNI and center for lifelong learning at UNIKG

Continuous professional education of teachers is very important requirement for teachers in the higher education sector. One of the project objectives was enhancement of professional competences and skills of teaching staff through training in modern pedagogical approaches, methodologies, and educational technologies. The training courses organised in the framework of the project activities will grow into a regular program of continual professional development (CPD) of teaching staff at the PC HEIs. Outcome of this task is the proposal of a Rulebook on continuing professional development of teaching staff in the field of teaching (not in the scientific field) approved by relevant bodies of the University of Niš, while, at the University in Kragujevac, a Center for professional development is formed and developed for the first time and a rulebook was adopted by relevant bodies. Both rulebooks established the forms of professional development for teachers/assistants, priority areas for vocational training programs, and other issues important for continual professional development to be enrooted in the system of higher education in order to strengthen personnel infrastructure. Modifications that are made by TeComp on Scientific-Teaching counsil of Faculty of Science and Mathematics in Nis, regarding scope of Center’s work: Education program for higher education teachers in the field of methodology and pedagogy of higher education teaching was added to previous version;
The process of accreditation of this program is carried out by the *Commission for accreditation of training programs for the education of higher education teachers in the field of methodology and pedagogy of higher education teaching*.
Accreditation of the program from this article is carried out if:
1) the program improves the knowledge, skills and expertise of the participants;
2) the program is based on the latest knowledge and achievements of the profession;
3) contributes to the improvement of the quality of professional work;
4) the topic, target group, type and duration of the program are clearly defined.



Природно-математички факултет у Нишу
Наставно-научном Већу Факултета

07.9.2022
01 1666

ПРЕДМЕТ: Измене и допуне Правилника о раду и организацији Центра за професионално усавршавање ПМФ

На састанку Програмског савета Центра за професионално усавршавање (ЦПУ), одржаном 30.08.2022. год. усвојене су следеће измене и допуне Правилника о раду и организацији ЦПУ, а по предлогу проф. др Јелене Игњатовић (захтев деловодни број: 01/1529, од дана 23.08.2022.)

1. У Члану 3., став 3., додати после В:

Г. Програм образовања високошколских наставника у области методике и педагогије високошколске наставе

2. Ставку под Г., променити у ставку под Д.

3. После Члана 4., убацити Члан 5., и извршити ренумерацију чланова који следе:

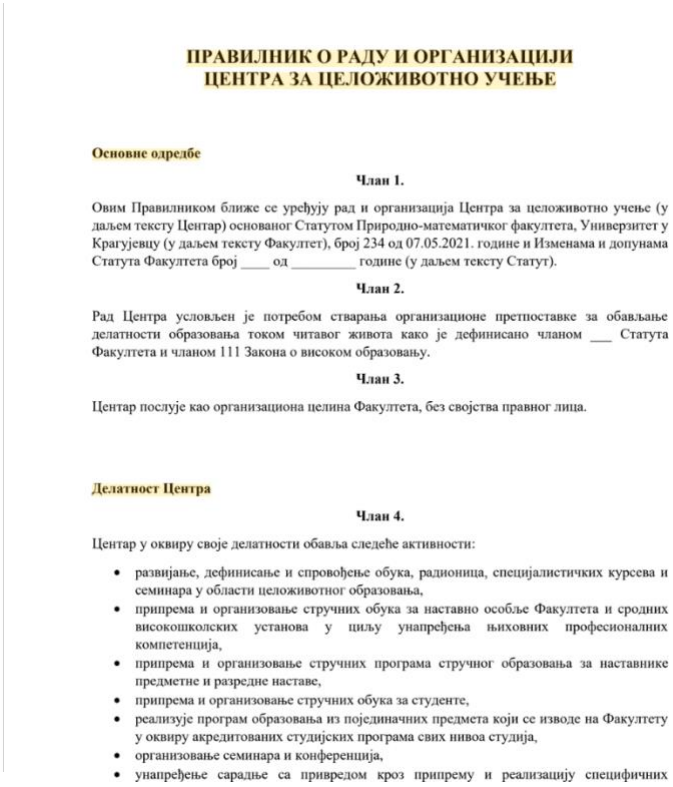
Право пријављивања за стицање образовања високошколских наставника у области методике и педагогије високошколске наставе имају сва заинтересована лица запослена на високошколским институцијама која имају потребе за стицањем нових вештина, знања и компетенција у области реализације високошколске наставе.

Приликом организовања обуке из става 1., овог члана, Факултет упућује и позив високошколским институцијама које су биле партнери пројекта Erasmus+ TeComp (Project No. 598434-EPP-1-2018-1-RS-EPPKA2-CBHE-JP) када обезбеђује on-line учешће ових иностраних учесника. У случају организације обуке са иностраним партнерима, званични језик обуке је енглески.

4. Члан 7. да гласи:

Делокруг рада Програмског савета је да:

1 од 3



ПРАВИЛНИК О РАДУ И ОРГАНИЗАЦИЈИ ЦЕНТРА ЗА ЦЕЛОЖИВОТНО УЧЕЊЕ

Основне одредбе

Члан 1.

Овим Правилником ближе се уређују рад и организација Центра за целоживотно учење (у даљем тексту Центар) основаног Статутом Природно-математичког факултета, Универзитет у Крагујевцу (у даљем тексту Факултет), број 234 од 07.05.2021. године и Изменама и допунама Статута Факултета број ____ од _____ године (у даљем тексту Статут).

Члан 2.

Рад Центра условљен је потребом стварања организационе претпоставке за обављање делатности образовања током читавог живота како је дефинисано чланом ___ Статута Факултета и чланом 111 Закона о високом образовању.

Члан 3.

Центар послује као организациона целина Факултета, без својства правног лица.

Делатност Центра

Члан 4.

Центар у оквиру своје делатности обавља следеће активности:

- развијање, дефинисање и спровођење обука, радионица, специјалистичких курсева и семинара у области целоживотног образовања,
- припрема и организовање стручних обука за наставно особље Факултета и сродних високошколских установа у циљу унапређења њиховних професионалних компетенција,
- припрема и организовање стручних програма стручног образовања за наставнике предметне и разредне наставе,
- припрема и организовање стручних обука за студенте,
- реализује програм образовања из појединачних предмета који се изводе на Факултету у оквиру акредитованих студијских програма свих нивоа студија,
- организовање семинара и конференција,
- унапређење сарадње са привредом кроз припрему и реализацију специфичних

CPD course

TEACHING AND ACCADEMC WRITING IN ENGLISH- TAWE

Faculty of sciences and mathematics, UNI

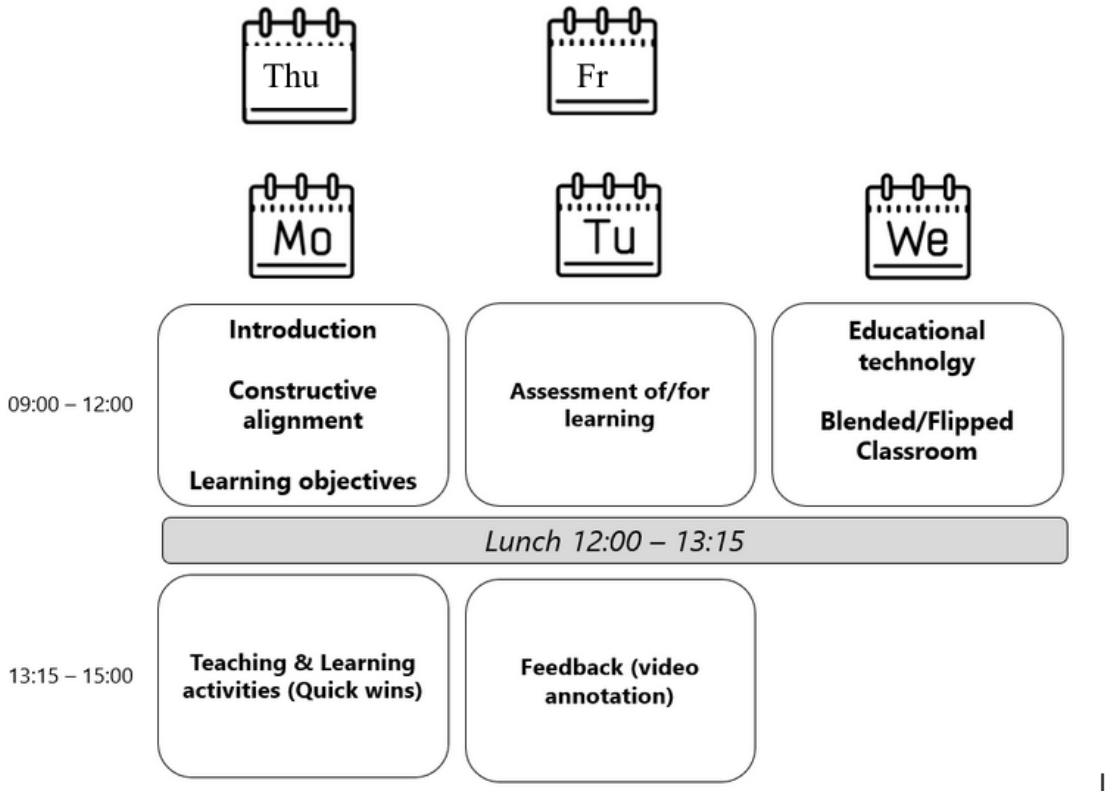
The significant innovation in the project is the program of Continual Professional Development of teaching staff, defined in the renewed Rulebook on CPD. The functioning of lifelong learning systems is very important for both university teachers and teaching assistants and employees in relevant areas. All accredited, approved, and innovated subject are provided to all interested stakeholders, while TeComp training courses grown up/will grow up to the short-cycle CPD courses.

The firs such course is one developed during the project, for strengthening English competences for teaching staff: Teaching and Academic Writing in English- TAWE.

Lecturers are:**Prof. dr Biljana Misic- Ilic, Prof. dr Jasmina Djordjevic**, **Prof. Nikola Tatar**

Material for Short-cycle CPD course conducted by UGENT

A pilot short-cycled CPD course, in the form of a training, was prepared and will be held just before the workshop in Nis. That is one of the prime examples and important contributions of project results. The course will be accredited through the Center for professional development of teaching staff at UNI.



Other trainings, held during the the project life by EU universities, will also be grown up into short-cycled CPD courses, which will be offered through the center. They are already in the preparation phase! To assure activities of the TeComp project after the end of funding by EACEA grant, alternative sources of money have been introduced: The participants will pay the attendance fee covering the costs associated with the course realization and the profit will be used to help assuring sustainability. All new/innovated courses are offered through the CPD center at the Faculty level, but also to wider audience and enterprise representatives.

Description of main deliverables

Sustainability – Curriculum Development

The accredited courses

On some Universities in Serbia and Albania, the accreditation period came at a clutch, so we managed to get many new subjects accredited or to accredited many update subjects. All those subjects and changes were made in close collaboration with our EU partners, who have given us a lot of useful advice. Even professors who were not originally members of the project team innovated on their subjects through regular communication with the colleagues from their universities, from which they realized the positive influence that modern methods bring to teaching and learning.

P1 – University of Niš (Faculty of Sciences and Mathematics)

	Title of the course	New or Updated	ECTS	Name of the degree / diploma	Course description / description of changes	Status of recognition/ accreditation
1	PROFESSIONAL/ PEDAGOGICAL PRACTICE	New	3	Bachelor of Computer Science	After the completion of professional practice, the student should be able to tackle concrete tasks that arise in daily practice and be able to work in an environment and conditions identical or nearly identical to those he will encounter in his future work.	Fully accredited
2	DIGITAL MEDIA IN BLENDED LEARNING	New	7		Through active participation in mastering the material and solving problems, students will develop their communication skills, ability for collaborative learning, get to know methods for creating audio and video materials using MOOCs platforms (Massive Open Online Courses).	
3	INTERACTIVE TOOLS FOR ONLINE TEACHING AND EXAMS	New	4		By participation in a series of new and ongoing projects, students should adopt and apply interactive tools and acquire skills in the implementation of science learning, teaching design, development and evaluation of teaching and ways of checking knowledge.	
4	VIRTUAL CLASSROOMS	New	7	Master of Computer Science	Students will be able to use tools to create an environment in a virtual digital space using the videoconference Lifesize system, to develop knowledge and skills in real-time distance communication, webinar organization, preparation of virtual presentations and video material related to a specific teaching topic.	Fully accredited
5	DEVELOPMENT OF PLATFORMS	New	7		Students will become familiar with all the principles of blended learning and able to	

	FOR BLENDED LEARNING			Master of Computer Science - Artificial Intelligence and Machine Learning	independently develop tools for platform transformation (Learning Management System) by building a database of questions for learning management systems to create personalized courses by usage of artificial intelligence, which would enable the application of AI in the implementation of teaching in the field of natural sciences and mathematics.	
6	DIDACTIC-INFORMATICS INNOVATIONS	New	7		The goal of the course is to enable students to acquire basic knowledge in the field of didactic innovations and innovations in teaching; understanding the function and importance of innovation in education (continue); and the role of didactic responses to the challenges of permanent social and technical-technological changes; development of the ability to select, implement and evaluate relevant didactic innovations.	
7	METHODOLOGY OF ELECTRONIC LEARNING	Updated	7		The content and outcomes of the course have not changed much, but the approach to teaching organization has completely changed. That approach is now based on teamwork, problem-based learning, flipped classroom, and active participation of students in the teaching and learning process. The changes amount to about 20-25%.	
8	PROFESSIONAL/ PEDAGOGICAL PRACTICE	Updated	3		The way of carrying out professional and pedagogical practice is harmonized with the latest standards for the accreditation of study programs both at bachelor's and master's studies – a new course on bachelor's studies was created, and the existing course on master's studies was updated. According to the old rules, the student was obliged to do 30 hours of active teaching during the pedagogical practice, and according to the new rules, the student is obliged to do 90 hours of various activities related to teaching, of which 30 hours are active teaching. The changes amount to about 300%.	
9	SOFTWARE PACKAGES IN TEACHING OF MATHEMATICS	Updated	7	Bachelor of Mathematics	The goal of the course is to enable students to effectively use auxiliary programming tools to obtain mathematical results, as well as for presenting mathematical content. The course encompasses solving tasks and problems with the help of computers and software packages Mathematica and GeoGebra.	Fully accredited
10	EDUCATIONAL SOFTWARE	New	6	Master of Mathematics	The course encompasses: Mathematical softwares as tools for teaching and learning; application of information technologies in didactic-methodical modeling of individual teaching topics and teaching units; using programs for the purposes of creating and conducting	Fully accredited

					electronic evaluation, checking and evaluation (creating knowledge tests with the help of WebQuiz and QuestionWriter programs); computer in the service of writing the necessary teaching materials (LaTeX).	
11	MULTIMEDIA SYSTEMS IN TEACHING OF MATHEMATICS	New	6		The course encompasses: Interactive teaching and learning by usage of computer networks. Creating remote lessons and interactive video lessons through which students can answer questions. Video editing. Services for video materials. Tools for creating and editing films in the teaching process. Creating and setting up a space for placement of video materials. Distance education directed to improve the quality of teaching - distance learning. Establishing a learning management system. The MOODLE software package.	
12	METHODOLOGY OF TEACHING MATHEMATICS	Updated	7		The content of the course was innovated by the introduction of new topics concerning new pedagogical approaches in testing and evaluating students' knowledge, as well as in the preparation, implementation, and analysis of the lesson. About 15-20% of the subject content has been changed.	
13	SCHOOL PRACTICE 1	Updated	3		A single subject, School Practice, with a total of 60 hours of teaching activities, was replaced by two subjects, School Practice 1 and School Practice 2, with a total of 180 hours of teaching activities, along with a corresponding change in teaching content. The changes amount to about 30%.	
14	SCHOOL PRACTICE 2	Updated	3			
15	METHODOLOGY OF MAKING CALCULATION ASSIGNMENTS	New	5	Bachelor of Physics	By successfully completing this course, the student acquires knowledge from a methodical approach for explanation of the basic physical laws by setting and solving calculation tasks.	Fully accredited
16	BASICS OF METHODOLOGY OF TEACHING PHYSICS	New	5		Student will be able to: understand the place and role of physics teaching at all levels of education, distinguish between teaching methods and learning methods, determine in which situations to apply which teaching method, connect didactic principles and real teaching situations, describe forms of work and didactic principles and real teaching situations, describe forms of work.	
17	PHYSICS IN SCHOOL 1	Updated	6	Master of Physics	A single subject, Physics in School, with a total of 60 hours of teaching activities, was replaced by two subjects, Physics in School 1 and Physics in School 2, with a total of 120 hours of teaching activities, along with a corresponding change in teaching content. The changes amount to about 20%.	Fully accredited
18	PHYSICS IN SCHOOL 2	Updated	6			

19	METHODOLOGY OF TEACHING PHYSICS	Updated	6		The number of hours of active teaching has increased by 50%, and the content of the course has changed even more, because part of the material from this course has been transferred to the newly established course Basics of Methodology of Teaching Physics (on Bachelor studies), and new contents have been added to this course. The amount of changes is at least 75%.	
20	TEACHING TOOLS OF PHYSICS 1	Updated	6		A single subject, Teaching Tools of Physics, with a total of 60 hours of teaching activities, was replaced by two subjects, Teaching Tools of Physics 1 and Teaching Tools of Physics 2, with a total of 120 hours of teaching activities, along with a corresponding change in teaching content. The changes amount to about 20%.	
21	TEACHING TOOLS OF PHYSICS 2	Updated	6			
22	SCHOOL PRACTICE	Updated	6		The way of carrying out professional and pedagogical practice is harmonized with the latest standards for the accreditation of study programs both at bachelor's and master's studies – a new course on bachelor's studies was created , and the existing course on master's studies was updated. As part of the content of this subject was moved to a new subject in the bachelor's studies, new contents are included here, as well as new methods of conducting pedagogical practice.The changes amount to about 50%.	
23	COMPUTER APPLICATION IN CHEMISTRY	New	4	Bachelor of Chemistry	The course encompasses: Independent use of the computer during the writing of seminar, professional and final papers in chemistry (MS Word for Windows and Microsoft PowerPoint), drawing graphics (Origin), processing the obtained experimental data (Microsoft Excel), drawing structural formulas (ChemDraw and ChemSketch), remote access instruments (TeamViewer), remote work in groups (Microsoft Teams) and chemical literature searches (KOBSON, Science Direct, SciFinder).	Fully accredited
24	MODERN METHODS OF LEARNING CHEMISTRY	New	7	Master of Chemistry	The goal of the course is training for the application of information and communication technologies and electronic design of teaching materials in modern chemistry teaching.	Fully accredited
25	METHODOLOGY OF TEACHING CHEMISTRY 1	Updated	6		The number of hours of active teaching in this course has increased by 25%, and the content of the course has been updated to an even greater extent. The course has been significantly modernized, both in terms of content and in terms of the teaching methods that are applied. Significant changes were also made in the concept of the subject, which is now oriented towards the teaching of general and inorganic	

					chemistry. The changes amount to about 40-50%.	
26	SCHOOL PRACTICE 1	Updated	5		The content of the course has not been significantly changed, but certain changes have been made in the teaching methods and the methods of checking students' knowledge. The changes amount to about 20%.	
27	METHODOLOGY OF TEACHING CHEMISTRY 2	Updated	4		Significant changes were made in the concept of the subject, which is now oriented towards the teaching of organic chemistry and biochemistry. Accordingly, appropriate changes were made in the content of the subject. The changes amount to about 20%.	
28	SCHOOL PRACTICE 2	Updated	4		The number of hours of active teaching in this course has increased by 20%, and accordingly, appropriate changes were made to the contents of the subject. Teaching methods and methods of checking students' knowledge have also been modernized significantly. The changes amount to about 25-30%.	
29	METHODOLOGY OF TEACHING BIOLOGY	Updated	6	Bachelor of Biology	The number of hours of active teaching in this course has been increased from 45 to 60 hours, and accordingly, appropriate updates were made to the contents of the subject. The changes amount to about 30-35%.	Fully accredited
30	SCHOOL PRACTICE	New	3	Bachelor of Geography	The course envisages visits to schools in order to get acquainted with the work of the geography teacher, the role of the teacher and the conditions for the implementation of the teaching process; introducing students to pedagogical documentation and the functioning of the educational institution.	Fully accredited
31	METHODOLOGY OF TEACHING GEOGRAPHY	Updated	6		The number of hours of active teaching in this course has been increased from 60 to 75 hours, and accordingly, appropriate updates were made to the contents of the subject. The changes amount to about 25%.	
32	METHODOLOGY OF PRACTICAL TEACHING OF GEOGRAPHY	Updated	6		The content of the course has been updated and modernized, and the concept of the course itself has been changed so that the course is primarily focused on developing competencies for the use of geographic teaching aids. The changes amount to about 25-30%.	
33	METHODOLOGICAL INNOVATIONS IN GEOGRAPHY	New	6	Master of Geography Master of Tourism	Students will be trained to competently apply models of developing teaching; is capable of finding new knowledge in the field of geography teaching development; be able to competently teach students in the field of project teaching; to develop competencies for the application of methodolo-gical innovations in geography; to classify students' know-ledge into	Fully accredited

					factual, conceptual, procedural and metacog-nitive; to be able to manage, in the capacity of a mentor, the process of creating graduation papers and other independent works of students.	
34	SCHOOL PRACTICE	New	3		Students will be trained to competently apply models of developing teaching; be capable of finding new knowledge in the field of geography teaching development; be able to competently teach students in the field of project teaching; to develop competencies for the application of methodolo-gical innovations in geography; classify students' know-ledge into factual, conceptual, procedural and metacogni-tive; to be able to manage, in the capacity of a mentor, the process of creating graduation papers and other indepen-dent works of students.	
35	EDUCATION OF CHILDREN WITH DISABILITIES AND DIFFICULTIES IN DEVELOPMENT	New	6		The goal of the course is familiarizing students with the characteristics of different categories of children with disabilities and developmental disabilities, their specificities, and limitations that developmental disabilities and handicaps bring, the need for additional support; familiarization with the concept of inclusive education and training for participation in the development of an individual educational plan.	
36	METHODOLOGY OF TEACHING TOURISM	New	4		The course covers: The role and competences of teachers of the tourism group of subjects in vocational secondary and higher schools. Active teaching in tourism subjects (characteristics, principles, and application). Use the different methods and forms of work in teaching. Specifics of teaching and teaching aids in teaching tourism (researching tourist destinations using the Internet and literature, creating tourist brochures using Microsoft Office and the Internet, creating, and presenting itineraries).	
37	PSYCHOLOGY	Updated	6	All study programs	The number of hours of active teaching in this course has been increased from 45 to 60 hours, and accordingly, appropriate updates were made to the contents of the subject. Practical teaching was also introduced, and in connection with that, teaching methods were modernized. The changes amount to about 30%.	Fully accredited
38	PEDAGOGY	Updated	6		The number of hours of active teaching in this course has been increased from 45 to 60 hours, and accordingly, appropriate updates were made to the contents of the subject. Practical teaching was also introduced, and in connection with that,	

					teaching methods were modernized. The changes amount to about 30%.	
39	PEDAGOGICAL COMMUNICATION	New	6	Master of Biology Master of Geography	After completing the course, students should summarize and define the basic terms and elements of pedagogical communication; to identify the basic shortcomings and weaknesses of communication in teaching and propose strategies to overcome them; to demonstrate the skills of successful communication in class, to use effective means of verbal and non-verbal communication; to analyze and distinguish different styles of conversation; to design and apply examples of nonviolent communication models and evaluate adequate models of interaction in certain educational situations.	Fully accredited

P2 – University of Belgrade (Faculty of Physics and Faculty of Mathematics)

	Title of the course	New or Updated	ECTS	Name of the degree / diploma	Course description / description of changes	Status of recognition / accreditation
1.	METHODOLOGY OF TEACHING PHYSICS 1	Updated	5	Bachelor study of Physics	Conceptual questions, PowerPoint Presentation, Google classroom The changes amount to about 30%.	Fully accredited
2.	METHODOLOGY OF TEACHING PHYSICS 2	Updated	5		Conceptual questions, PowerPoint Presentation, Google classroom The changes amount to about 30%.	
3.	EDUCATIONAL STANDARDS	Updated	6		Redevelopment of question/task at a higher explicitly indicated level The changes amount to about 20%.	
4.	PEDAGOGICAL RESEARCH IN PHYSICS	Updated	6	Master study of Physics	Educational posters, PowerPoint Presentation, platforms such as Google classroom, Zoom, Big Blue Button The changes amount to about 20%.	Fully accredited
5.	APPLIED METHODOLOGY OF TEACHING PHYSICS	Updated	6		Camtasia, Edpuzzle, Animaker The changes amount to about 20%.	
6.	MODERN TEACHING TOOLS	Updated	6		Remote control in lab work The changes amount to about 40%.	
7.	DISTANCE LEARNING IN PHYSICS	New	4		Google Classroom, Microsoft Teams, Big Blue Button, CamScanner, PowerPoint Presentation, Canva, posters, quizzes.	

8.	COMPUTER SCIENCE AND SOCIETY	Updated	3	Bachelor studies of Computer Science	Course aims: Stimulating students to perceive the role of computing in contemporary society. Getting to know the ethical issues that arise in the application of computer. Development of critical thinking among students in the application of computers.	Approved

P4 – University of Kragujevac (Faculty of Science)

	Title of the course	New or Updated	ECTS	Name of the degree / diploma	Course description / description of changes	Status of recognition / accreditation
1.	EXPERIMENTS IN TEACHING OF PHYSICS	New	14	PhD studies in Physics	An interdisciplinary approach to physics teaching and introduction scientific method in teaching.	Fully accredited
2.	METHODOLOGY OF SCIENTIFIC RESEARCH WORK	New	14		Perceive the relationship: model-theory-simulation-experiment, the relationship between mathematics and physics, multidisciplinary approach to solving modern scientific problems.	
3.	SELECTED CHAPTERS OF PHYSICS TEACHING METHODOLOGY	New	14		Training students (future teachers) for the application of modern methodical principles and techniques of educational information technologies in preparing and conducting physics lessons. Using professional literature, modern learning models. An interdisciplinary approach to teaching.	
4.	APPLICATION OF MODERN ICT IN PHYSICS TEACHING	New	15		Students will study the basic methods of implementing modern software and hardware teaching aids. This primarily refers to software packages for demonstrations, simulations and presentations.	
5.	EDUCATIONAL SOFTWARE	New	5	Bachelor study of Mathematics	The student has acquired the necessary theoretical knowledge and skills for using educational software and is able to adapt and practically use different educational software. He is familiar with various mini-languages that he can use effectively in teaching.	Fully accredited
6.	INNOVATIONS IN TEACHING OF MATHEMATICS	New	6		Acquaintance with modern teaching methods (active learning, problem-based teaching, heuristic teaching, collaborative and cooperative learning, STEM education, mixed learning, distance learning), which have in common that they emphasize student activities, and move the role of the teacher to the domain of the organizer and moderator of the activity. Application of those methods in teaching mathematics, observing advantages and	

					disadvantages. Integration of information technologies in order to improve teaching.	
7.	BASICS OF CRITICAL THINKING	New	6	Master study of Mathematics	Development of students' critical spirit in order not to fall into classic traps whose roots lie in inappropriate interpretations of statistical and probability results, errors of reasoning, rhetorical twists, etc. The student learns to extract objective information from the mass of information available to him. The main topics include a critical analysis of numerous everyday applications that can lead the user of the information to the wrong conclusion.	Fully accredited
8.	PROFESSIONAL PRACTICE	New	3		Acquainting students with the conditions and way of working in: • economic organizations in which the production process, that is, the field of business, involves work in the field of mathematics and computer science; • educational and scientific-research institutions whose activities include the fields of mathematics and computer science; • cultural institutions, which popularize science and indicate the importance of education. The goal is for students to see the global organization and the way organizations function, the place and role of experts in the field of mathematics and computing, to observe and analyze business tasks, as well as to take part in solving them.	
9.	EXPERIMENTS IN THE TEACHING OF BIOLOGY	Updated	6	Master study of Biology	Partial content change. Additional contents have been introduced that aim to improve the digital teaching competencies of students, as well as the competencies of students related to distance learning. The changes amount to about 15-20%.	Approved
10.	BIOLOGY TEACHING METHODOLOGY 2	Updated	6			
11.	CONTEMPORARY TEACHING IN BIOLOGY	Updated	6			
12.	SCHOOL EXPERIMENTS IN THE TEACHING OF CHEMISTRY	Updated	3	Bachelor study of Chemistry	Partial content change. Additional contents have been introduced that aim to improve the digital teaching competencies of students, as well as the competencies of students related to distance learning. The changes amount to about 15-20%.	Approved
13.	TEACHING METHODOLOGY OF GENERAL AND INORGANIC CHEMISTRY	Updated	6			

14.	TEACHING METHODOLOGY OF ORGANIC CHEMISTRY	Updated	6			
15.	METHODS AND TECHNIQUES IN TEACHING CHEMISTRY	Updated	7			
16.	SCHOOL PRACTICE 1	Updated	6			
17.	CHEMISTRY TEACHING METHODOLOGY IN WORKING WITH GIFTED STUDENTS	Updated	4	Master study of Chemistry	Partial content change. Additional contents have been introduced that aim to improve the digital teaching competencies of students, as well as the competencies of students related to distance learning. The changes amount to about 15-20%.	Approved
18.	SCHOOL PRACTICE 2	Updated	5			
19.	CONTEMPORARY FORMS OF TEACHING CHEMISTRY	Updated	4			
20.	SOFTWARE TOOLS 2	Updated	4	Bachelor study of Mathematics	Partial content change. An additional topic related to programming Lego robots has been introduced. The changes amount to about 15-20%.	Approved
21.	EDUCATIONAL SOFTWARE SOFTWARE	Updated	4		Partial content change. Additional contents have been introduced with the aim of training students to adequately use tools for creating environments in virtual digital space, as well as developing knowledge and skills for real-time remote communication. The changes amount to about 15-20%.	
22.	INFORMATICS TEACHING METHODOLOGY	Updated	6		Partial content change. Additional content related to the use of tools for creating interactive content has been introduced. The changes amount to about 15-20%.	Approved

23.	PROGRAMMING TEACHING METHODOLOGY	Updated	6		Partial content change. Additional content related to the use of tools for the implementation of distance learning has been introduced. The changes amount to about 15-20%.	

P5 - Eqrem Çabej University Gjirokastër (Faculty Of Natural Sciences)

	Title of the course	New or Updated	ECTS	Name of the degree / diploma	Course description / description of changes	Status of recognition / accreditation
1	COMMUNICATION AND INFORMATION TECHNOLOGY IN EDUCATION	Updated	8	Master in Teaching English in Lower Secondary Education	The subject aims at the preparation of the students for the application of computer technology to support the teaching process. New technologies will be used to support the teaching strategy, the preparation of didactic material, the professional improvement, the productivity of scientific research. They will also be prepared to find and filter information for educational purposes. In this respect the study program has been updated using the teaching material created in the framework of TECOMP project. The changes amount to about 10-20%.	Approved
2	INFORMATION TECHNOLOGY IN TEACHING	Updated	6	Master in Teaching Mathematics and Informatics in Lower Secondary Education	The subject is partially updated to add to the content of the program to encourage the use and integration of computer technology for the enhancement of the teaching and learning competences. The changes amount to about 10-20%.	Approved
3	RESEARCH SEMINAR	Updated	5		The teaching plan is updated with five empirical cases extracted from the teaching material created in the framework of TECOMP. The study of TECOMP material, will benefit the students to understand the main principles and methods used in technical and experimental sciences, to define the main techniques of scientific studies, to practice data collection, analyses and report, and to carry out a solid scientific project on theoretical and methodological issues. The changes amount to about 10-20%.	
4	INCLUSION IN EDUCATION	Updated	6	Professional Master in Teaching for Special Purposes	The teaching plan is updated with one topic extracted from the teaching material created in the framework of TECOMP. The aim was to add to the general objective of the program that aims at providing students with professional skills to support the access of every individual including individuals with limited skills in higher education institutions and reducing their social inclusion. The changes amount to about 10-20%.	Approved

5	CURRICULUM DEVELOPMENT	Updated	6	Master in Teaching in Lower Secondary Education	The program was partially updated with a topic extracted from the teaching material created in the framework of TECOMP. The aim is to introduce to the students the concept of a 21st century textbook, to instruct them on the way it can be used and to acquaint them with the requirements for a good textbook. This material perfectly adds to the general objective of the subject. The changes amount to about 10-20%.	Approved
6	IMPROVEMENT OF LEARNING AND CRITICAL THINKING	Updated	12		The program was partially updated with two topics extracted from the teaching material created in the framework of TECOMP. The first topic is related to the cognitive and social constructivism, while the second one focuses on the techniques to encourage teaching and interactive learning. The two topics are an added value to the overall content of the teaching program. The changes amount to about 10-20%.	
7	SCHOOL PSYCHOLOGY	Updated	6	Professional Master in Teaching Elementary Education	The program was partially updated with a topic extracted from the teaching material created in the framework of TECOMP. The topic, Pedagogic effective communication in Higher Education, falls under the main objectives of the subject and provides the students with innovative information. The changes amount to about 10-20%.	Approved
8	RESEARCH IN EDUCATION	Updated	6	Master in Teaching Bio-Chemistry in Lower Secondary Education	The program was partially updated with a topic extracted from the teaching material created in the framework of TECOMP. The students will be provided, among others, with information on the four steps to find a solution to a problem based on problem-based learning. TECOMP book gives sufficient information on the elaboration of the topic. The changes amount to about 10-20%.	Approved
9	METHODOLOGY OF COMMUNICATION AND INFORMATION TECHNOLOGY IN EDUCATION	Updated	4	Master in Teaching for Special Purposes	The program was partially updated with a topic extracted from the teaching material created in the framework of TECOMP. The topic, Modernization of Teaching and Learning in Higher Education, will provide students with knowledge on the use of new technologies and pedagogical tools, new teaching and learning methods and digital skills for the modernization of higher education and the role of higher education institutions and the government. The changes amount to about 10-20%.	Approved

The modernized courses published on the LearningKey platform

The courses and subjects provided to the LearningKey platform are those whose structure and themes are not changed, but the methodology of teaching and learning is modernised in accordance with new knowledge acquired during the training courses organised withing the TeComp project activities, as well as in regular communication with professors from EU partner universities. In this way, 87 subject are modernised by using contemporary pedagogical and methodical practice and modern technologies (considering the knowledge acquired during the TeComp activities) – 33 subjects at UNI, 13 subjects at UB, 9 subjects at UNS, 16 subjects at UNIKG, 4 subjects at ECUG and 12 subjects at UNIKO.

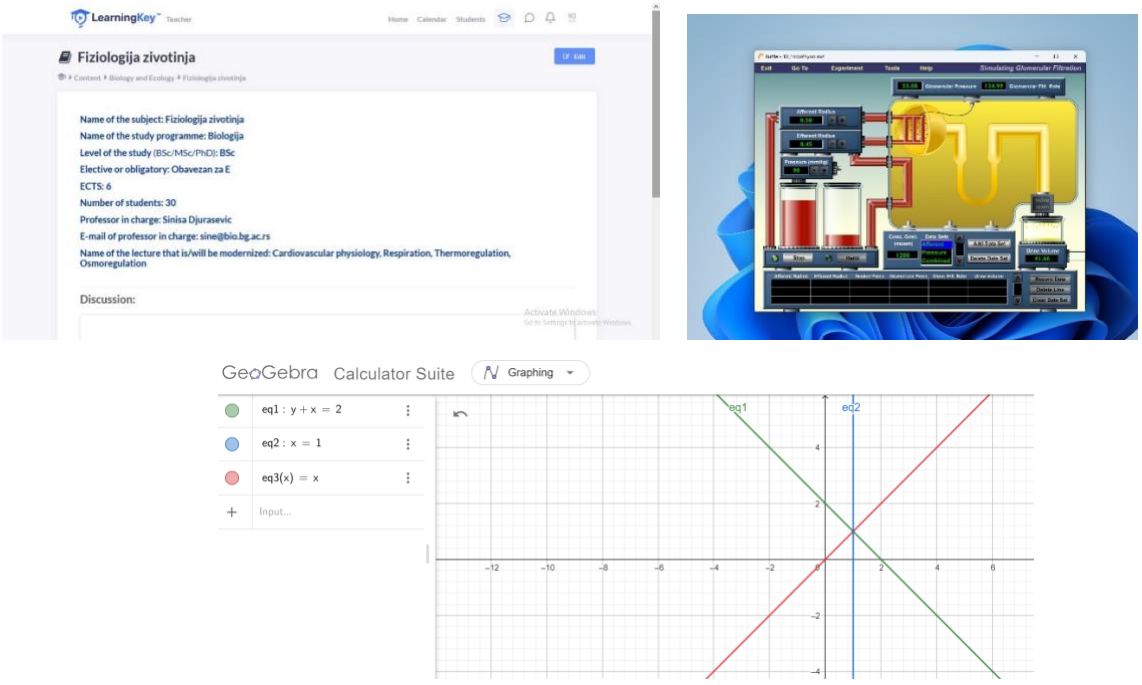


Figure 2. Some details from LearningKey platform

The platform has been created and adapted during the project life, but the idea for its structure and realisation was created in close and longlisting collaboration between the Department of Computer Science, Faculty of sciences and mathematics, University of Niš and project coordinator PhD Jelena Ignjatovic, and a renowned software company Badin Soft from Nis, sometime before the project. Due to the high complexity of the platform, not all its features could be realised during the period of the project activities, so it is good we started developing it earlier.

Complete statistics, such as presented on the image above, can be downloaded from the platform website as well on Google Chrome browser (which is currently recommended for the use with LearningKey platform).

Below, the statistics of the students who listened to innovated subjects and actively used LearningKey platform can be seen.

Total student->units in School	School Name
1856	P1 - University of Niš
1001	P4 - University of Kragujevac
219	P3 - University of Novi Sad
111	P5 - Eqrem Çabej University Gjirokastër
42	P2 - University of Belgrade
35	P6 - Fan S. Noli University Korce

New teaching materials related to selected lectures are published at LearningKey platform for the following modernized BSc and MSc courses at the University of Niš.

P01-1. Data structures and algorithms;
P01-2. Mathematics 1;
P01-3. Mathematics 2;
P01-4. Linear algebra (Computer Science);
P01-5. Design and analysis of algorithms;
P01-6. Discrete structures 1;
P01-7. Cryptographic algorithms- practical classes;
P01-8. Web programming- practical classes;
P01-9. Introduction to differential equations;
P01-10. The methodology of teaching mathematics;
P01-11. Design and analysis of algorithms- practical classes;
P01-12. Linear algebra- practical classes;
P01-13. Mathematics 2- practical classes;
P01-14. Linear algebra (Mathematics);
P01-15. Methodology of e-learning- practical classes;
P01-16. Introduction to Web programming;
P01-17. Introduction to Environmental chemistry;
P01-18. Chemodinamics of pollutants;
P01-19. Chemistry of water and soil;
P01-20. Humic substances in the environment;
P01-21. Laboratory analysis of water and soil;
P01-22. Advanced Environmental Chemistry - Problem Solutions;
P01-23. Advanced Environmental Chemistry;
P01-24. Multimedia systems in education;
P01-25. Pedagogy;
P01-26. Didactics 1;
P01-27. Andragogy (Adult education);
P01-28. Pedagogy for students of history and sociology;
P01-29. Didactis 2;
P01-30. Pedagogy (second semester 2021/22);
P01-31. History of pedagogy 1;
P01-32. History of pedagogy 2;
P01-33. Contemporary educational trends.

New teaching materials related to selected lectures were published at LearningKey platform or implemented directly in subjects' curriculums for the following modernized BSc and MSc courses at the University of Belgrade.

P02 - 1. Biomedical Ecophysiology;
P02 - 2. Endocrinology;
P02 - 3. Physiology of animals;
P02 - 4. Ethnobotany and phytochemistry;
P02 - 5. Basis of medical genetics;
P02 - 6. Computers and society;

P02 - 7. Methodology of teaching physics 1;
P02 - 8. Methodology of teaching physics 2;
P02 - 9. Pedagogical research in physics;
P02 - 10. Applied methodology of teaching physics;
P02 - 11. Modern teaching tools;
P02 - 12. Educational standards;
P02 - 13. Distance learning.

New teaching materials related to selected lectures are published on LearningKey platform for the following modernized BSc and MSc courses at the University of Novi Sad

P03-1 Mathematical Analysis I
P03-2 Mathematical Analysis II
P03-3 Decision Theory
P03-4 Seminar paper – Mathematical Modelling
P03-5 Numerical methods and optimization
P03-6 Financial mathematics 1
P03-7 Innovation in teaching geography
P03-8 Geographic basis of special ethnology
P03-9 Boolean algebra and optimization

New teaching materials related to selected lectures are published at LearningKey platform for the following modernized BSc and MSc courses at the University of Kragujevac.

P04-1. Probability and statistics 1;
P04-2. Probability and statistics;
P04-3. Educational software;
P04-4. Selected chapters of statistics;
P04-5. Introduction to programming;
P04-6. Practicum in programming 3;
P04-7. Mathematics 2;
P04-8. Introduction to analysis and algebra;
P04-9. Methodology of geometry teaching;
P04-10. Probability and statistics 2;
P04-11. History and philosophy of mathematics;
P04-12. Discrete mathematics;
P04-13. Mathematical physics 2;
P04-14. Microbial ecology;
P04-15. Biochemical and microbiological principles;
P04-16. Organic chemistry didactics.

New teaching materials related to selected lectures are published at LearningKey platform for the following modernized Bachelor and Master courses at the University of Gjirokastra.

P05-1 Research Seminar
P05-2 Biophysics
P05-3 Inclusion in education

P05-4 Probability and statistics

New teaching materials related to selected lectures are published at LearningKey platform for the following modernized Bachelor and Master courses at the University of Korçë.

P06-1. History of the development of mathematical thought
P06-2. Mathematical analysis 2
P06-3. Methodology of teaching mathematics
P06-4. Probability and Statistics
P06-5. Algebra 2
P06-6. Mathematics in secondary education
P06-7. MATLAB
P06-8. Discrete Mathematics
P06-9. Cryptography
P06-10. General Physics 2
P06-11. Physics 2

Sustainability – CDP (LLL)

Innovated/New Rulebooks on CPD of Teaching Staff

Continuous professional education of teachers is very important requirement for teachers in the higher education sector. One of the project objectives was enhancement of professional competences and skills of teaching staff through training in modern pedagogical approaches, methodologies, and educational technologies. The training courses organized in the framework of the project activities will grow into a regular program of continual professional development (CPD) of teaching staff at the PC HEIs. Outcome of this task is the proposal of a Rulebook on continuing professional development of teaching staff in the field of teaching (not in the scientific field) approved by relevant bodies of the University of Niš, while, at the Faculty of Science, University in Kragujevac, a Center for professional development is formed and a rulebook was adopted by relevant body (Quality Assurance Commission of Faculty of Science). Both rulebooks established the forms of professional development for teachers/assistants, priority areas for vocational training programs, and other issues important for continual professional development to be enrooted in the system of higher education in order to strengthen personnel infrastructure.

Rulebook on CPD of Teaching Staff
University of Niš

In recent years, the functioning of all bodies in higher education partner institutions was hampered by the Covid-19 pandemic. At the University of Nis, the regulations on the work of the Center for Lifelong Education have been amended. The new proposals of the rulebook in usage of pedagogies and methodologies has been added: All interested persons, employed at higher education institutions, who need to acquire new skills, knowledge, and competences in the field of higher education teaching have the right to apply for professional education in the field teaching methodology and pedagogy. In occasions when organizing the training, the faculty also will send an invitation to higher education institutions that were partners of the Erasmus+ TeComp project (Project No. 598434-EPP-1-2018-1-RS-EPPKA2-CBHE-JP) to provide an on-line participation of these foreign trainers. One of the most important changes is that in case of organization of training with foreign partners, the official language of the training will be English. In addition to, all the members of the Center, teachers, lecturers and experts from other faculties and universities can participate in the work of the Commission for accreditation of specialist courses of continuous professional development and the Commission for accreditation of training programs for the education of higher education teachers, in the field of methodology and pedagogy of higher education teaching, upon invitation. Both accreditation commissions consist of five members, one of whom is the president of the commission. The introduction of CPD in the system of higher education in the field of pedagogy and methodology of teaching is a significant goal of the project which is accomplished.

Rulebook on the Center for Lifelong Learning
University of Kragujevac

During the project activities, teachers from Kragujevac got motivated for enhancement of their professional competences and skills in modern pedagogical approaches, methodologies, and educational technologies. The training courses organized in the framework of the project, raised awareness among the teaching staff of the necessity of strengthening of personnel infrastructure, and consequently, a regular program of continual professional development, named as Center for lifelong learning, was prepared and adopted at the Faculty of science, University of Kragujevac. TeComp team members made proposal of Rulebook of Center for lifelong learning, and it was adopted by relevant body (Quality Assurance Commission of Faculty of Science).

CPD course TEACHING AND ACCADEMC WRITING IN ENGLISH- TAWE Faculty of sciences and mathematics, UNI

The significant innovation in the project is the program of Continual Professional Development of teaching staff, defined in the renewed Rulebook on CPD. The functioning of lifelong learning systems is very important for both university teachers and teaching assistants and employees in relevant areas. All accredited, approved, and innovated subject are provided to all interested stakeholders, while TeComp training courses grown up/will grow up to the short-cycle CPD courses. The first such course is one developed during the project, for strengthening English competences for teaching staff: Teaching and Academic Writing in English - TAWE.

Sustainability – Teaching/Training Matherial

Teaching/Training material for psychological, pedagogical, and methodological (PPM) training courses and Guidelines for the technological enhancement of teaching and learning

Aim of Tasks 2.2 and 2.4 activity were preparation of printed and electronic material for psychological, pedagogical, and methodological (PPM) training courses and Guidelines for the technological enhancement of teaching and learning.

After trainings held by EU partners, team from Serbia begun to work intensively on preparation of the material for PPM training courses, as well as guidelines for the technological enhancement of teaching and learning. In order to optimize publishing process, at online CMT held on 22nd March 2021, coordinators agreed to form Editorial board for training material related to activity 2.2 and 2.4. Elected members of Editorial board were:

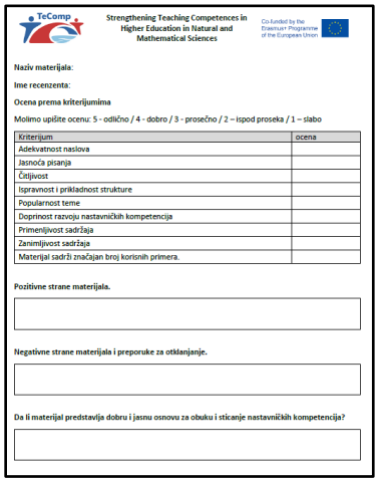
1. Zorana Lužanin (UNS) president,
2. Miroslav Ćirić (UNI),
3. Andrijana Zekić (UB),
4. Siniša Đurašević (UB),
5. Slađana Dimitrijević (UNIKG).

The Editorial board was entrusted with the management of the process of collecting and reviewing teaching materials, as well as the selection of materials for printing and the design of volumes.

Draft versions of teaching and learning materials, each of them in Serbian and in English, were collected till LCM in Kragujevac in June 2021. At that meeting Editorial board defined review process and schedule of activites. During the summer 2021 review process was ended. Reviewers for individual themes were TeComp team members from UB, UNS, UNI, UNIKG. For Teaching/Training material for psychological, pedagogical, and methodological (PPM) training courses there were involved 3 males and 3 females:

1. Miroslav Ćirić,
2. Siniša Đurasinović,
3. Miroslav Marić,
4. Zorana Lužanin,
5. Slađana Dimitrijević,
6. Andrijana Zekić.

Reviewers for hole volume were 2 female TeComp team members from UGR (María C. Cañadas Santiago) and UO (Irina Perfilieva).



Naziv materijala:

Ime recenzenta:

Ocena prema kriterijumima

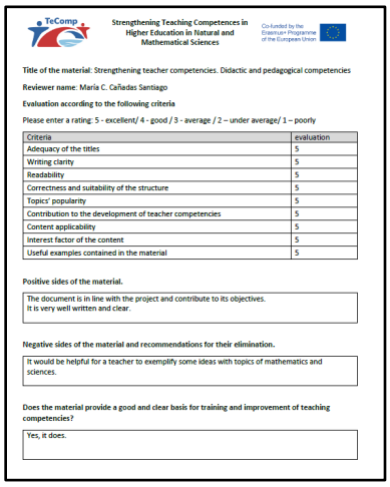
Molimo upišite ocenu: 5 - odlično / 4 - dobro / 3 - prosečno / 2 – ispod proseka / 1 – slabo

Kriterijum	ocena
Adekvatnost naslova	
Jasnoća pisanja	
Čitljivost	
Ispravnost i prikladnost strukture	
Popularnost teme	
Doprinost razvoju nastavničkih kompetencija	
Primenljivost sadržaja	
Zanimljivost sadržaja	
Materijal sadrži značajan broj korisnih primera.	

Pozitivne strane materijala.

Negativne strane materijala i preporuke za otklanjanje.

Da li materijal predstavlja dobru i jasnu osnovu za obuku i sticanje nastavničkih kompetencija?



Title of the material: Strengthening teacher competencies. Didactic and pedagogical competencies

Reviewer name: María C. Cañadas Santiago

Evaluation according to the following criteria

Please enter a rating: 5 - excellent/ 4 - good / 3 - average / 2 – under average/ 1 – poorly

Criteria	evaluation
Adequacy of the titles	5
Writing clarity	5
Readability	5
Correctness and suitability of the structure	5
Topics' popularity	5
Contribution to the development of teacher competencies	5
Content applicability	5
Interest factor of the content	5
Useful examples contained in the material	5

Positive sides of the material.

The document is in line with the project and contribute to its objectives.
It is very well written and clear.

Negative sides of the material and recommendations for their elimination.

It would be helpful for a teacher to exemplify some ideas with topics of mathematics and sciences.

Does the material provide a good and clear basis for training and improvement of teaching competencies?

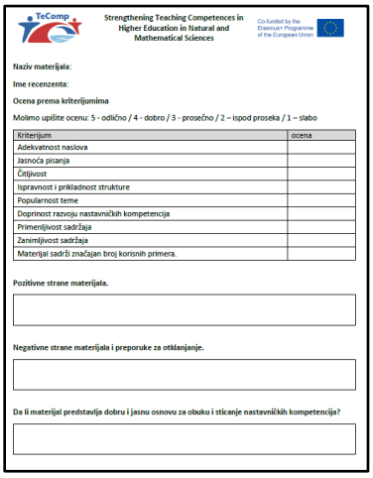
Yes, it does.

Figures 3. Review form and Review of Volume **STRENGTHENING TEACHER COMPETENCES** - DIDACTIC AND PEDAGOGICAL COMPETENCES

Reviewers for individual themes about the technological enhancement of teaching and learning were TeComp team members from UB, UNS, UNI, UNIKG. There were involved 1 male and 5 females:

1. Goran Radojev,
2. Jelena Ignjatović,
3. Andreja Tepavčević,
4. Slađana Dimitrijević,
5. Ivana Radojević,
6. Andrijana Zekić.

Reviewers for hole volume were 1 male and 1 female TeComp team member from UNIOVI (Luis J. Rodríguez Muñiz) and UO (Petra Murinova).



Naziv materijala:

Ime recenzenta:

Ocena prema kriterijumima

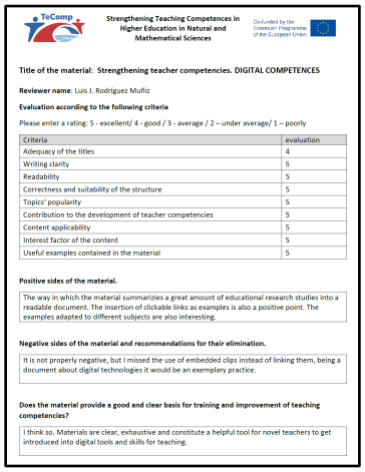
Molimo upišite ocenu: 5 - odlično / 4 - dobro / 3 - prosečno / 2 – ispod proseka / 1 – slabo

Kriterijum	ocena
Adekvatnost naslova	
Jasnoća pisanja	
Čitljivost	
Ispravnost i prikladnost strukture	
Popularnost teme	
Doprinost razvoju nastavničkih kompetencija	
Primenljivost sadržaja	
Zanimljivost sadržaja	
Materijal sadrži značajan broj korisnih primera.	

Pozitivne strane materijala.

Negativne strane materijala i preporuke za otklanjanje.

Da li materijal predstavlja dobru i jasnu osnovu za obuku i sticanje nastavničkih kompetencija?



Title of the material: Strengthening teacher competencies. DIGITAL COMPETENCES

Reviewer name: Luis J. Rodríguez Muñiz

Evaluation according to the following criteria

Please enter a rating: 5 - excellent/ 4 - good / 3 - average / 2 – under average/ 1 – poorly

Criteria	evaluation
Adequacy of the titles	4
Writing clarity	5
Readability	5
Correctness and suitability of the structure	5
Topics' popularity	5
Contribution to the development of teacher competencies	5
Content applicability	5
Interest factor of the content	5
Useful examples contained in the material	5

Positive sides of the material.

The way in which the material summarizies a great amount of educational research studies into a readable document. The insertion of clickable links as examples is also a positive point. The examples adapted to different subjects are also interesting.

Negative sides of the material and recommendations for their elimination.

It is not properly negative, but I missed the use of embedded clips instead of linking them, being a document about digital technologies it would be an exemplary practice.

Does the material provide a good and clear basis for training and improvement of teaching competencies?

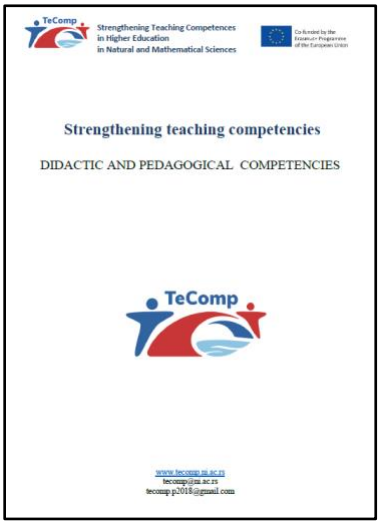
I think so. Materials are clear, exhaustive and constitute a helpful tool for novel teachers to get introduced into digital tools and skills for teaching.

Figures 4. Review form and Review of Volume **STRENGTHENING TEACHER COMPETENCES** - DIGITAL COMPETENCES

Final versions of all materials were accepted by Editorial board on online meeting held on 25th August. Materials were organized in two booklets. One booklet is devoted to didactic and pedagogical competences and the other to digital competences. At the end of year 2021 the materials were published in Serbian and English.

Volume **STRENGTHENING TEACHER COMPETENCES** - DIDACTIC AND PEDAGOGICAL COMPETENCES have 9 themes (193 pages), written by 9 authors (2 males and 7 females) from 3 universities (UNI, UNS, UB):

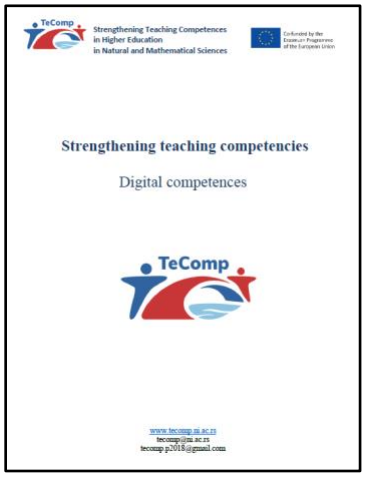
1. Miroslav Ćirić: **Modernisation of teaching and learning in the European Higher Education Area**,
2. Zorana Lužanin, Andreja Tepavčević: **Preparation of teaching materials - Example of a textbook**,
3. Andreja Tepavčević, Zorana Lužanin: **Assessment of student knowledge - How to evaluate math students**,
4. Predrag Vujović: **Ask, Don't Tell! Techniques to Promote Interactive Teaching and Learning with Understanding**,
5. Marija Jovanović: **Effective pedagogical communication in higher education - How to communicate in class?**
6. Jelena Petrović: **Constructivist approach to teaching and learning in higher education**,
7. Aleksandra Anđelković: **Effective teaching through the believes and reflexivity of teacher**,
8. Dragana Jovanović: **Teaching methods in university settings - How to teach students how to learn**,
9. Jelisaveta Todorović: **Difficulties and challenges of inclusion in higher education**.



Figures 5. Cover pages in Serbian and English version of Volume **STRENGTHENING TEACHER COMPETENCES -** DIDACTIC AND PEDAGOGICAL COMPETENCES

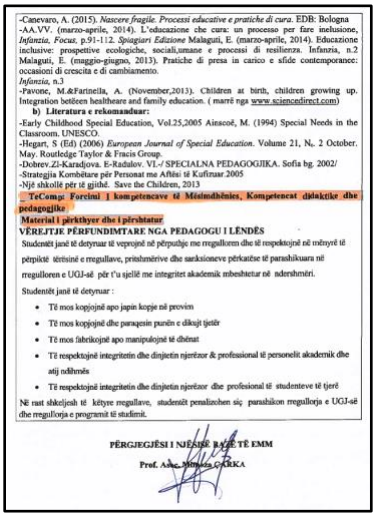
Volume **STRENGTHENING TEACHER COMPETENCES** - DIGITAL COMPETENCES (in Serbian and in English). There are 7 themes (146 pages), written by 10 authors (3 males and 7 females) from 4 universities (UNI, UNS, UB, UNIKG):

1. Jelena Ignjatović: **Creating interactive teaching materials**,
2. Slađana Dimitrijević, Ana Kaplarević Mališić: **Blended learning with special reference to the Flipped classroom**,
3. Nebojša Jasnić, Siniša Đurašević: **Modernization of teaching and learning biology**,
4. Tatjana Anđelković, Ivana Kostić: **Remote access to analytical instruments in chemistry higher education – From idea to realization**,
5. Goran Radojev: **Visualization problems using GeoGebra and Wolfram Mathematica**,
6. Đurđica Takači: **Mathematics contents in dynamic geometry environment**
7. Sana Stojanović Đurđević: **Theorem prover Isabelle in the teaching of natural and mathematical sciences**.



Figures 6. Cover pages in Serbian and English version of Volume **STRENGTHENING TEACHER COMPETENCES -** DIGITAL COMPETENCES

During the spring 2022 partners from Albania, translated it in Albanian. 7 staff members (Irma Gjolleshi, Dhori Terpo, Antuela Sinani, Loreta Mamani, Mimoza Çarka, Romeo Mano, Isidor Kokalari) from Eqrem Çabej University Gjirokastër were involved in translating the materials. Also, ECUG adopted this volume as a part of literature for several courses related to Methodology and Pedagogy.



Figures 7. Cover page in Albanian version of Volume **STRENGTHENING TEACHER COMPETENCES -** DIDACTIC AND PEDAGOGICAL COMPETENCES and the innovated literature for course Inclusion in Education

During the spring 2022 partners from Albania, translated it in Albanian. 4 staff members (Lorenc Ekonomi, Denisa Kafazi, Msc. Silvja Çobani, Ardian Çërava) from Fan S. Noli University Korce were involved in translating the materials.

Figure 8. Cover page in Albanian version of Volume **STRENGTHENING TEACHER COMPETENCES** - DIGITAL COMPETENCES

From the sustainability point of view, it is very important to stress that prepared material stays available to the teaching staff at all partners institutions and presents a good base for their further professional development.

Teaching/Training material for language support for teaching staff

Aim of Task 2.3 activity was preparation of printed and electronic material for language support for teaching staff.

In order to increase capacities of teaching staff in natural and mathematical sciences for teaching and academic writing in English and thus provide better options for internationalization of the HEIs, both at the institutional and personal level, the team of three teachers from the University of Niš, Faculty of Philosophy, designed an intensive, specialist course (realised within WP3) entitled *Teaching and Academic Writing in English for Natural and Mathematical Sciences* (*TAWE*) and the appropriate teaching material for it. TAWE course is based on the material carefully designed to cover crucial aspects in teaching academic courses in English and better academic writing in English in the fields of natural and mathematical sciences (the use of class language, instructions for effective lecturing, organizing interactive lectures, the use of teaching tools and visual aids, the forms of academic writing, differences between spoken and written academic genres, etc.). The TAWE course has its predecessors in three series of EMI courses implemented at four largest state universities in Serbia (Belgrade, Novi Sad, Niš, Kragujevac). The first one was in 2016, within the Tempus project *Fostering University Support Services and Procedures for Full Participation in the European Higher Education Area (FUSE)*, coordinated by the University of Niš. The other two were within the National Erasmus+ initiative *Study in Serbia* (2019 and 2021). The participants and the EMI lecturers were university teachers from the same four participating Serbian universities as in TeComp project. A small portion of the open-source material used for these courses was used for TAWE, but most of the TAWE material, primarily the handbook, was specially written, designed and adapted for this project.

The course (teaching/learning/training) material was prepared in the activity 2.3, and partly during the course implementation in the activity 3.4. The primary course material is TAWE course handbook, written by the three instructors (Mišić Ilić, Đorđević, Tatar 2021). It was printed and distributed to course participants, and also uploaded as a pdf in the Google classroom dedicated for the course implementation as Teaching and academic writing in English - TAWE.pdf, available for course participants.

Volume **STRENGTHENING TEACHER COMPETENCES –** TEACHING AND ACADEMIC WRITWNING IN ENGLISH have 6 themes (57 pages):

1. Introduction,
2. English medium instruction (EMI),
3. Focus on lecturing,
4. Academic writing,
5. Differences between spoken and written academic language,
6. Focus on language.

The course material was prepared in two phases. First, the three instructors designed the draft course syllabus, and wrote the first version of the TAWE handbook (July-September 2021). After the needs analysis of the potential participants in September 2021, the final version of the TAWE course handbook was completed in October 2021. It was printed later in 2021.

The TAWE course, and the material prepared for it, is based on the theoretical principles of English for Specialized Purposes, ESP, and English (as a) Medium of Instruction EMI. ESP is an approach to English teaching that identifies and targets current and/or future academic or

occupational needs of learner populations, focuses on the necessary language, genres, and skills to address these needs, and designs courses whose content and aims are oriented to the specific needs of the learners, using general and/or discipline specific teaching materials and methods. The subfield of ESP known as English for academic purposes (EAP) focuses on ESP in academic settings.

Figures 9. Cover pages of Volume **STRENGTHENING TEACHER COMPETENCES** – TEACHING AND ACADEMIC WRITWNING IN ENGLISH

From the sustainability point of view, it is very important to stress that prepared material stays available to the teaching staff at all partners institutions and presents a good base for their further professional development.

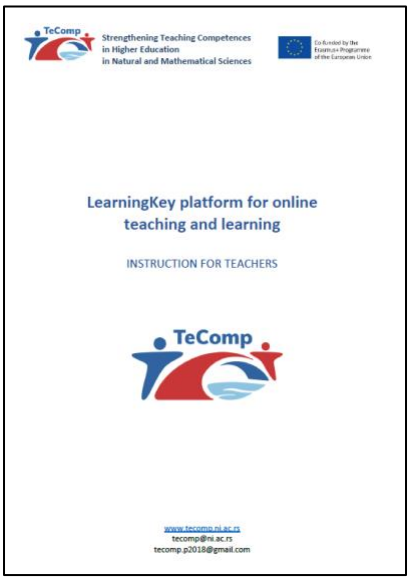
Sustainability – Learning platforms

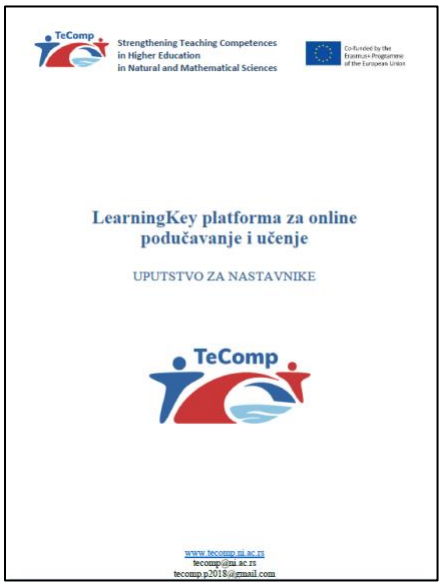
LearningKey platform

The e-learning portal based on the LearningKey platform has been set up as part of the TeComp project activities. The LearningKey platform is a cloud software solution that offers services for the application of educational technologies. In the LearningKey environment, teachers (educators) are enabled to, to the extent they wish, digitize the teaching and learning process and offer students/participants a comprehensive interactive experience during the learning process. The platform offers tools for creating and managing online courses, testing and evaluation, virtual classrooms with scheduling systems, homework functions, providing the conditions for full digitalization of the learning process.

The e-learning platform of the TeComp project is available at https://learning.tecomp.ni.ac.rs/. There are available instructions, booth in Serbian and in English, intend for teachers who will use the platform. The functionality of the platform are explained in details in the prepared manual by team members: Jelena Ignjatović (INI) and Ana Kaplarević Mališić (UNIKG). It includes the following functions designed for teachers:

- Defining and structuring a course,
- Defining and managing lectures in a course,
- Defining, creating, and checking homework,
- Defining, reviewing and uploading results of automatically graded tests.

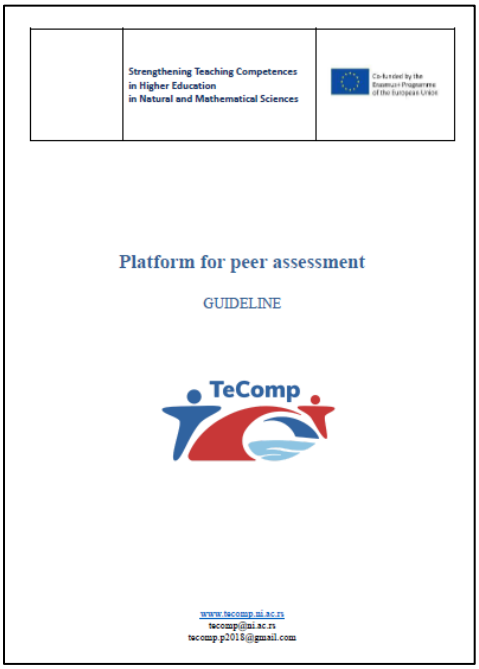




Figures 10. Cover pages of LearnigKey manuals

Platform for peer evaluation

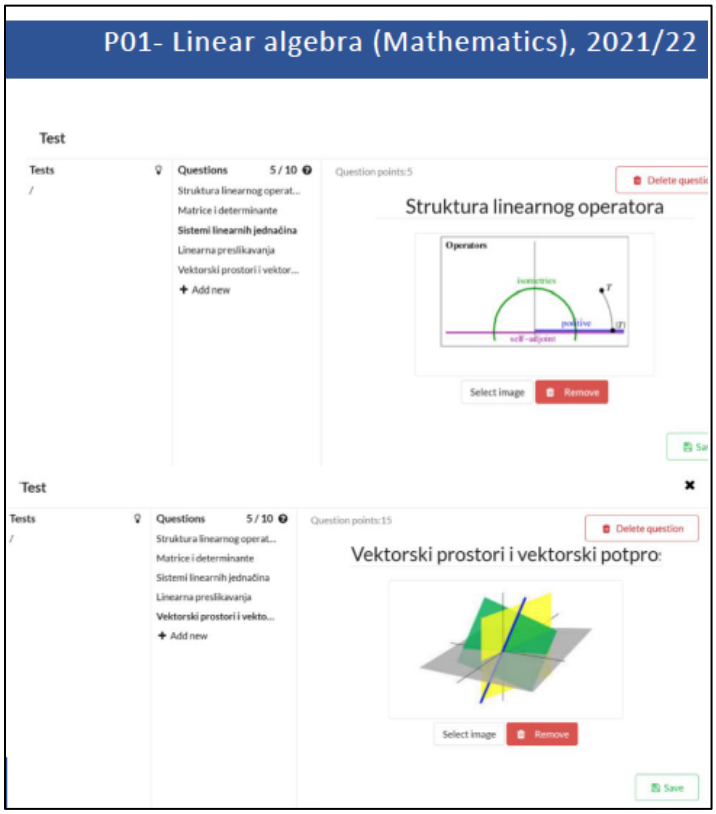
As part of the introduction of innovations in teaching, inspired by the TeComp project, a platform for peer evaluation was created. This platform is a software solution that allows professors to create questionnaires, divide students into groups where each student fills out a questionnaire created by the professor for each colleague from the group. In this way, students get the opportunity to practice assertively giving comments and suggestions to their colleagues, and also to learn how to accept and process the feedback they received. Students are free to express their opinion because giving answers is unnamed (anonymous), but the professor has the ability to monitor the process of work and giving comments, which ensures monitoring and suspension of inappropriate answers. The peer review platform is available at http://evaluacija.xyz. There is available instruction for usage of platform (in English and Serbian), created by team member Jelena Matejić, primarily intended for teachers who would like to use this platform for the purpose of innovating their subjects, especially for working in groups and peer assessment within groups. Using the application is very simple, it is not necessary to install it, but it is accessed directly through the link previously mentioned. As access is very easy and simple, you can apply the application in educational institutions of all levels.



Figures 11. Cover pages of Platform for peer evaluation manual

Systems for electronic testing

Systems for electronic testing developed Study programs at participating universities in Serbia are not accredited for distance learning. Such accreditation would require special conditions and technical requirements related to the secure identification of students being tested remotely and preventing nonacademic behavior during the remote testing process. For that reason, final exams cannot be performed by electronic distance testing. However, electronic testing is allowed to be used in some activities that are parts of pre-examination obligations, such as homework and colloquia. Many courses and additional periodic online evaluations were organized for students in order to raise their engagement and ensure reaching learning outcomes. Systems for electronic testing were developed in the Microsoft Teams and Moodle platforms and also in the LearningKey platform. Unique software solution for the development of system for electronic testing and monitoring is created on LearningKey platform. Questions for the tests and quizzes can be randomly chosen from the created database of questions. It is very important for students to check their knowledge, to be informed about their results and mistakes that they have eventually made. Immediate feedback allows students to identify and fill gaps, which has a very large positive impact on success in learning.



Figures 12. Examples of tests on LearningKey platform

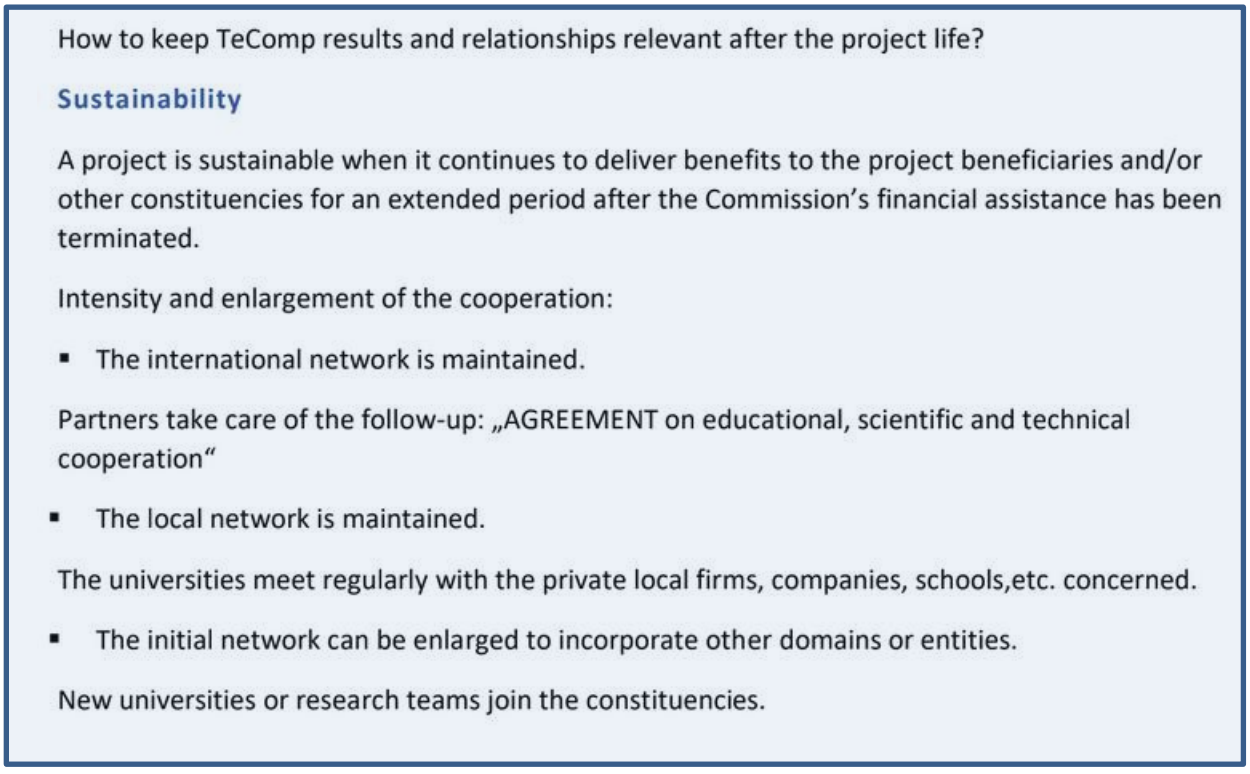
All develop platforms are available to all partner institution in Serbia and Albania for further use, also some team members plan to improve some platforms tools. This ensure sustainability of achieved results.

Sustainability – Future Cooperation

The sustainability of the TeComp Project will cover three areas:

1. Continuation of activities from the active period of the Project realization;
2. Providing financial resources for the implementation of these activities;
3. Confirmation of the mutual interest of the project partners in the continuation of cooperation expressed in the "Agreement on educational, scientific and technical cooperation".

The draft version of the Agreement for the workshop has been prepared.



How to keep TeComp results and relationships relevant after the project life?

Sustainability

A project is sustainable when it continues to deliver benefits to the project beneficiaries and/or other constituencies for an extended period after the Commission's financial assistance has been terminated.

Intensity and enlargement of the cooperation:

- The international network is maintained.

Partners take care of the follow-up: „AGREEMENT on educational, scientific and technical cooperation"

- The local network is maintained.

The universities meet regularly with the private local firms, companies, schools,etc. concerned.

- The initial network can be enlarged to incorporate other domains or entities.

New universities or research teams join the constituencies.

The final version of the strategy for improvement of the quality of teaching and learning has also been created in Serbian and English (cited below).

"The changes in the education system that includes higher education as well, must keep pace with the changing times. This means that education has to follow constant changes at the job market from the industrial model of production towards the fast-transforming technology-guided and mutually connected globalized economy of knowledge. It is necessary to optimize the learning process, including the use of technological innovations for enhancing and transforming learning, and thus develop competencies for lifelong learning. Moreover, one should not neglect the change in the learners' expectations, who demand the education system that is more connected and relevant for their everyday life and professional progress.

The most important objective of study programs that is already indicated in the vision is to provide employability of graduated students at demanding positions, as well as to train the students for the process of life-long learning. Since this objective is placed at the end of the education process, it is necessary to enable its realization through other objectives. The first objective is certainly the transition of the students from high school to university education, where it is necessary that a student enters a learning- inspiring environment and the teaching staff with exceptional professional and pedagogical competencies, in order to provide for the adequate progress of the students. From all that was mentioned above, there follow five strategic objectives"

What will surely be sustained after the project is the friendships made along the way!

www.tecomp.ni.ac.rs
tecomp@ni.ac.rs
tecomp.p2018@gmail.com

University of Niš

The TeComp Consortium

www.tecomp.ni.ac.rs
e-mail:
tecomp@ni.ac.rs
tecomp.p2018@gmail.com

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

This project has been co-funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein