

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



Co-funded by the
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of the European Union

Professional development of teaching staff - WP3

Jelena Matejić
University of Niš, Serbia

Final Conference, Belgrade, October 9-11, 2022





Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences



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Activity 3.1.

Organising the workshop on
innovative T&L methodologies and
pedagogical approaches

Activity 3.2.

PM training of teacher staff

Activity 3.3.

Training of teaching staff for using
new educational technologies

Final Conference, Belgrade, October 9-11, 2022

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF
GHENT

Final Conference, Belgrade, October 9-11, 2022



Activity 2.2.

Webinar Ghent



Title:	Introduction to the online professional development course “Educational Interaction and Communication”												
Schedule:	4th and 8th - 10th February 2021 4 online Zoom sessions <table border="1"><tr><td>February 9, 2021</td><td></td></tr><tr><td>February 10, 2021</td><td></td></tr><tr><td>February 8, 2021</td><td></td></tr></table> <table border="1"><tr><td>Kragujevac and Gjirokastra Professional Development in Educational Interaction and Communication - KRA_GJIR_2021</td><td>📅</td></tr><tr><td>Novi Sad and Nis - Educational Interaction and Communication - Nov_Nis_2021</td><td>📅</td></tr><tr><td>Belgrade and Korce - Professional Development in Educational Interaction and Communication - BEL_KORC_EIC2021</td><td>📅</td></tr></table>	February 9, 2021		February 10, 2021		February 8, 2021		Kragujevac and Gjirokastra Professional Development in Educational Interaction and Communication - KRA_GJIR_2021	📅	Novi Sad and Nis - Educational Interaction and Communication - Nov_Nis_2021	📅	Belgrade and Korce - Professional Development in Educational Interaction and Communication - BEL_KORC_EIC2021	📅
February 9, 2021													
February 10, 2021													
February 8, 2021													
Kragujevac and Gjirokastra Professional Development in Educational Interaction and Communication - KRA_GJIR_2021	📅												
Novi Sad and Nis - Educational Interaction and Communication - Nov_Nis_2021	📅												
Belgrade and Korce - Professional Development in Educational Interaction and Communication - BEL_KORC_EIC2021	📅												
Participants:	67 total (12 UNI, 19 UB, 8 UNS, 11UNIKG, 5 ECUG, 12 UNIKO)												

Activity 2.2.

Webinar Ghent



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UFORA

Report problem nl



WELCOME
ONLINE
CAMPUS

On- and offline:
connected
throughout the
academic year
2020-21.

On- and offline throughout
the academic year 2020-21

-> Read more



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Activity 3.2.

Online training Ghent



Title:	Educational Interaction and Communication
Schedule:	15th February 2021- 17th May 2021 12-week course, 45 hours (1,5 ECTS credits).
Topics:	1) Knowledge Clips 2) Interactive video 3) Posters 4) Discussion and collaboration 5) Animations 6) Asking questions.
Participants:	77 total (17 UNI, 21 UB, 12 UNS, 18UNIKG, 1 ECUG, 8 UNIKO)

Activity 3.2.

Online training Ghent



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Design of this professional
develop...



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Theme 1 - Knowledge clips:
educatio...



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Theme 4 - Discussion and
collaborat...



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Theme 5 - Animations as an
interact...



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Theme 2 - Interactive video



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Theme 3 - Posters: a forgotten
lear...



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Theme 6 - Asking questions



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Activity 3.2.

Online training Ghent



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I hereby confirm that Çobani, Silvja, staff member of the University of Korce, has successfully finalized the Professional Development course "*Educational Interaction and Communication in Higher Education*".

This is a 12-week course, implying a time investment of 45 hours (1,5 ECTS credits).

The following topics were tackled by the staff member during this online task-based course: (1) Knowledge Clips, (2) Interactive video, (3) Posters, (4) Discussion and collaboration, (5) Animations and (6) Asking questions.

The course focused on the design and development of course-related solutions and on developing interactive feedback in a peer assessment revision cycle.

Ghent (Belgium), June 15 2021

Prof. Dr. Martin Valcke
Ghent University Belgium

Jelena Ignjatovic
Coordinator TECOMP+ project






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Activity 3.2.

Training University of Ghent in Niš



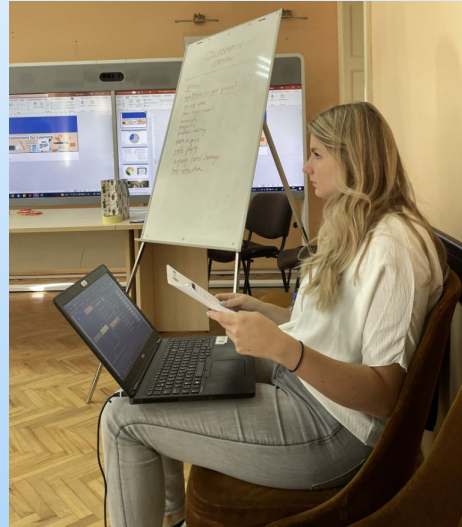
Title:	Masters of Didactics												
Schedule:	12th - 14th September 2022 <div style="text-align: center;"></div> <table border="1" style="width: 100%; text-align: center;"><tr><td style="width: 20%; vertical-align: middle;">09:00 – 12:00</td><td style="width: 33%; padding: 10px;">Introduction Constructive alignment Learning objectives</td><td style="width: 33%; padding: 10px;">Assessment of/for learning</td><td style="width: 14%; padding: 10px;">Educational technology Blended/Flipped Classroom</td></tr><tr><td colspan="4" style="background-color: #cccccc; padding: 5px;"><i>Lunch 12:00 – 13:15</i></td></tr><tr><td style="vertical-align: middle;">13:15 – 15:00</td><td style="padding: 10px;">Teaching & Learning activities (Quick wins)</td><td style="padding: 10px;">Feedback (video annotation)</td><td></td></tr></table>	09:00 – 12:00	Introduction Constructive alignment Learning objectives	Assessment of/for learning	Educational technology Blended/Flipped Classroom	<i>Lunch 12:00 – 13:15</i>				13:15 – 15:00	Teaching & Learning activities (Quick wins)	Feedback (video annotation)	
09:00 – 12:00	Introduction Constructive alignment Learning objectives	Assessment of/for learning	Educational technology Blended/Flipped Classroom										
<i>Lunch 12:00 – 13:15</i>													
13:15 – 15:00	Teaching & Learning activities (Quick wins)	Feedback (video annotation)											
Participants:	23 total (UNI, UB, UNIKG, UNS)												

Activity 3.2.

Training University of Ghent in Niš



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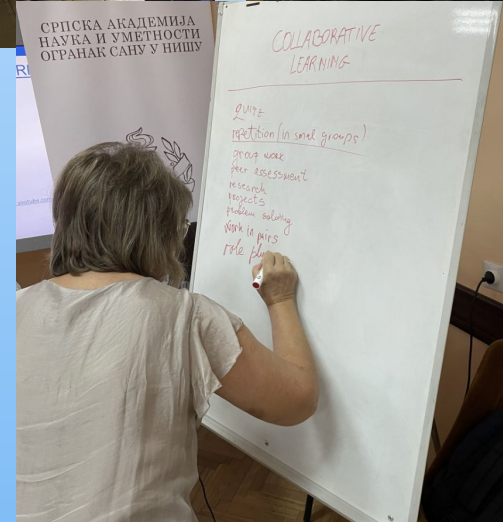
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Activity 3.2.

Training University of Ghent in Niš



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Prof. Dr. Martin Valcke
Innovation in higher education
University of Ghent



Dr. Britt Adams
(Professional development) in higher education
University of Ghent



Maxime Moens
Wellbeing policy in primary and secondary schools
University of Ghent



Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF GRANADA

Final Conference, Belgrade, October 9-11, 2022



Activity 2.2.

Webinar Granada



Title:	Virtual seminar
Schedule:	2 nd – 4 th December 2020
Topics:	<ol style="list-style-type: none">1) Training in higher education. A general perspective2) Design of a training plan for in-service mathematics teachers3) Teaching Methods4) Assessment of student learning at university level5) Teaching planning
Participants:	60 total (Albania, Czech Republic, Slovakia, Serbia)

Activity 2.2.

Webinar Granada



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Task 1.

1.1. Identify the different levels that exist in your context for designing a teaching plan.

1.2. Look for the documents related to levels in order to organize the teaching plan.

Teaching planning is an essential part of any lecturer's role. Lesson plans help make sure the teaching is well- organized and effective. That's why in Albania there are several levels that take part in designing a teaching plan

The levels of teaching planning in A

1. Educational authorities.

The Ministry of Education, Sports and Culture, number 879, dated 18.12.2019 has defined the levels of teaching guides (ECTS, educational components, org, etc.)

2. University and Faculty/Depa

Universities following the educational outline of the teaching guides. For each teaching guide has the same format for all the faculties

3. Teaching staff

The teaching staff fills out the teaching guide, defining the teaching objectives, learning outcomes, units, and


Teaching guide structure

Course guid for: ANIMAL BEHAVIOUR			Academic year 2021/2022		
MODULE	SUBJECT MATTER	YEAR	SEMESTAR	CREDITS	TYPE
Biology		3	second	5 ects	obligatory
TEACHING STUFF:			CONTACT DETAILS:		
1. Prof. Sofija Pavković-Lučić 2. Prof. Lidija Radenović 3. dr Jelena Trajković			e-mail: jelena.trajkovic@bio.bg.ac.rs		
BELONGS TO UNDERGRADUATE DEGREE PROGRAMME:			BELONGS TO OTHERS UNDERGRADUATE DEGREE PROGRAMMES:		
Bachelor					
PREREQUISITES OR RECOMMENDATIONS					
Knowledge about genetics and physiology					
BRIEF DESCRIPTION OF THE COURSE					
Students will gain modern knowledge related to the genetic and physiological basis of behavior, the role of behavior in survival and evolution, as well as to overcome the methods used in research into animal and human behavior.					
COMPETENCES					
General competence:					
- basic general knowledge					
- analyze and synthesize materials					
- oral and written communicate on native language					
- communicate in multidisciplinary groups					
- ability to obtain and analyze information from different sources					
- ability to criticize					
- research and learning ability					

TASK 2. Option A

2.1. Selected course for analysis and improvement is: **Structure of Atoms and Molecules.**

The teaching guide is presents below in the form that is officially accepted at University of Nis.

 UNIVERSITY OF NIŠ		
Course Unit Descriptor	Faculty	Faculty of Science and Mathematics

GENERAL INFORMATION

Chemistry
/
Structure of Atoms and Molecules
<input checked="" type="checkbox"/> Bachelor <input type="checkbox"/> Master's <input type="checkbox"/> Doctoral
<input checked="" type="checkbox"/> Obligatory <input type="checkbox"/> Elective
<input checked="" type="checkbox"/> Autumn <input type="checkbox"/> Spring
2d
7



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Activity 2.2.

Webinar Granada



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Certificate of attendance

This is to certify that

Bojan Berlekovic

participated in the following activity organized in the framework of the project **TeComp (Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences)**, co-financed by the Erasmus+ Programme (Key Action 2: Cooperation for innovation and the exchange of good practices – Capacity Building in higher education):

“Training teachers in higher education. Design of a training plan”, held in Granada (Spain) in a virtual modality. This activity was developed from 1-14 December, 2021; and implied 40h of work.

Granada, 14 June 2022

María Consuelo Cañadas Santiago
UGR Project Coordinator



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

Activity 3.2.

Online training Granada



Title:	Teacher's training
Schedule:	1st – 14th December 2021
Topics:	1) Training teachers in higher education. Design of a training plan 2) Teaching methods in higher education 3) Design of a training plan 4) Evaluation in higher education
Participants:	84 total

Activity 3.2.

Online training Granada



2020

- Module 1. Training teachers in higher education.
- Module 2. Teaching planning
- Module 3. Teaching methods. Teaching and learning in online environments
- Module 4. Assessment of student learning at university level.



2021

- Module 1. Teaching planning.
- Module 2. Teaching methods.
- Module 3. Evaluation at higher education.

8



Certificate of attendance

This is to certify that

XX|

participated in the following activity organized in the framework of the project **TeComp (Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences)**, co-financed by the Erasmus+ Programme (Key Action 2: Cooperation for innovation and the exchange of good practices – Capacity Building in higher education):

“Training teachers in higher education. Design of a training plan”, held in Granada (Spain) in a virtual modality. This activity was developed from 1-14 December, 2021; and implied 40h of work.

Activity 3.2.

Final training in Granada



Title:	Effective teaching strategies
Schedule:	16th – 20th May 2022
Topics:	1) Characteristics of teaching 2) Technology in the classroom 3) Effective teaching strategies
Participants:	16 total The most active teachers from Serbia and Albania



Activity 3.2.

Final training in Granada



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University of Granada



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María C. Cañadas
University of Granada



Antonio Moreno
University of Granada



Purificacion Pérez
University
of Granada



Vanesa Gámiz
University
of Granada



Katia Caballero
University
of Granada



Diego Pablo Ruiz
University
of Granada



Pedro Gómez
University
of Granada

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF
OVIEDO

Final Conference, Belgrade, October 9-11, 2022



Activity 1.3.

Exchange of experiences in Oviedo



Title:	Innovative teaching methodologies for mathematics and sciences
Schedule:	25th – 29th March 2019 25 hours of training
Topics:	1) Institutional reception by the rector of the University of Oviedo 2) The Innovation Center of the University of Oviedo (Dr. Aquilina Fueyo) 3) The INIE: Institute for Educational Research and Innovation (Dr. Emilio Álvarez Arregui) 4) ...
Participants:	44 total (27 from partner universities + 17 from the University of Oviedo)

Activity 1.3.

Exchange of experiences in Oviedo



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Activity 2.4.

Webinar University of Oviedo



Title:	Preparing and Creating Materials for ICT Training
Schedule:	9th – 11th December 2020 online
Topics:	1) Recording, editing and blending educational videos: OBS, OpenShot Editor and EdPuzzle 2) Blended and flipped learning 3) eXeLearning as a tool for creating digital content 4) R as a tool for creating randomize test models exportable to Moodle
Participants:	61 total (58 partner universities + 3 University of Oviedo)

Activity 2.4.

Webinar University of Oviedo



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What would you like your students to do when you teach with a presentation?



Watching their
devices?



Attending the
lectura in the
classroom or at
home?



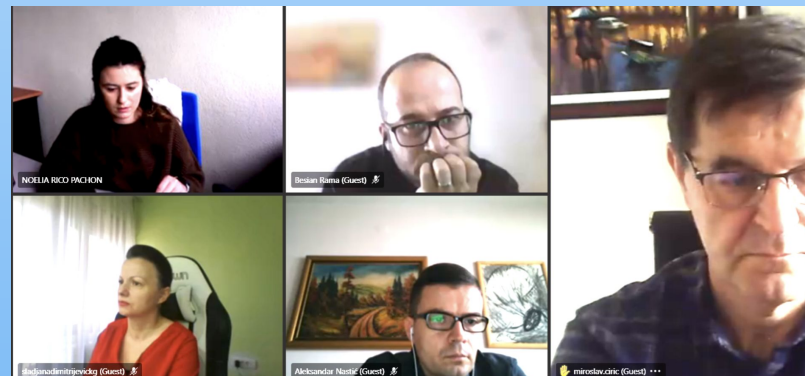
Following what
you read?



Taking notes?



Paying
attention?



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Activity 3.3.

Online IT training, University of Oviedo



Title:	Boosting Technologies in Higher Education
Schedule:	15th – 17th December 2021 online (12,5 hours training)
Topics:	1) Attractive approach: active participation and creative 2) Motivating resources: gamification, augmented reality, and robotics 3) Project-based learning tracking from a Technological perspective 4) Guided individual practice
Participants:	61 total (58 partner universities + 3 University of Oviedo)

Activity 3.3.

Online IT training, University of Oviedo



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Creative presentations

Canva
Beautiful presentations

Pexels
Photo bank

FreePick
Photo bank

Mindomo
Mind maps

Coggle
Mind maps

The screenshot shows a Classroom interface. The main area displays a presentation slide with a large image of an iceberg. A sidebar on the right shows a list of participants with their initials (M, NV, N, +23). At the bottom, there is a toolbar with various interactive tools like background, random name, dice, sound level, media, QR code, draw, text, work symbols, traffic light, timer, stopwatch, clock, and calendar.

Canva	Pexels and FreePick	Mindomo and Coggle	Perusall	Mentimeter, ClassMaker and...
<p>erea López-Bouzas 7d</p> <p>students to make an graphic on cell types</p>	<p>Anonymous 14h</p> <p>Make interactive presentation</p>	<p>Anonymous 14h</p> <p>Use to recapitulate knowledge at the end of the field</p>	<p>Anonymous 14h</p> <p>Assigning readings and engaging the reading material.</p>	<p>Anonymous 14h</p> <p>I would use Men...</p>
<p>Anonymous 14h</p> <p>the infographic on tions of axiomatic roaches to the Set ory</p>	<p>Anonymous 14h</p> <p>Using an image that is difficult to draw by hand or in one of the available tools</p>	<p>Anonymous 14h</p> <p>I would use it in class for the students to create the mindmap in order to sistemize the topic such as</p>	<p>Anonymous 14h</p> <p>Developing discussion about interesting topic or some problem that is not easy solvable</p>	<p>Anonymous 14h</p> <p>the end of class get the feedback students unders and knowledge a topic.</p>

TeComp

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Activity 3.3.

Training University of Oviedo in Niš



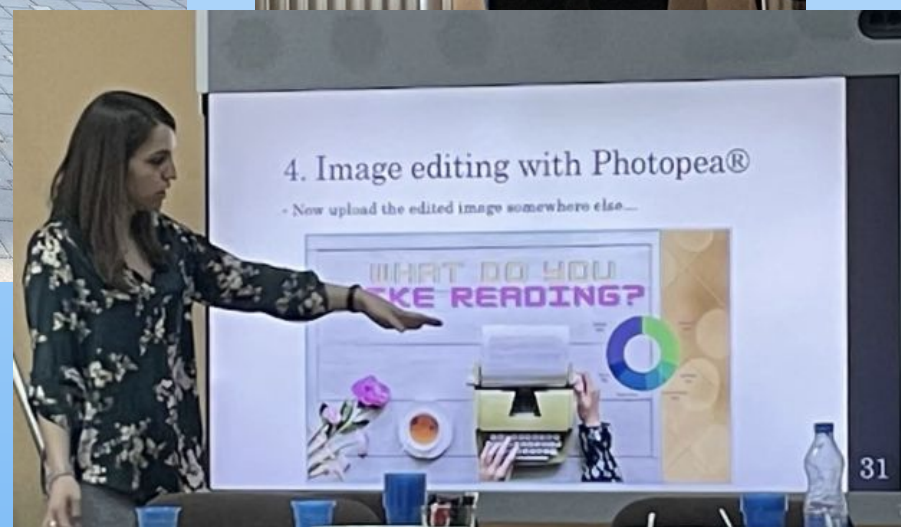
Title:	Boosting Technologies in Higher Education II
Schedule:	28th – 30th March 2022 5,5 hours of training
Topics:	1) Searching, designing, and editing educational images, audios, and videos 2) Designing graphs for data visualization 3) Designing and assessing different type of formative tasks: self-assessment, peer assessment, group discussion and problem-based tasks
Participants:	42 total (38 partner universities + 4 University of Oviedo)

Activity 3.3.

Training University of Oviedo in Niš



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Activity 3.3.

Final training in Oviedo



Title:	Observing innovative practices
Schedule:	26 th – 30 th September 2022 24 hours of training
Goals:	<p>To share the experience of the implementation of new methodologies and technological tools in several types of lectures and university degrees</p> <p>To hold some institutional visits to reinforce the contact between the University of Oviedo and the partner universities for guaranteeing the sustainability of the project results</p>
Participants:	25 total (16 partner universities + 9 University of Oviedo)

Activity 3.3.

Final training in Oviedo



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L0. Natural Deduction

$\wedge I$	$\frac{A \quad B}{A \wedge B}$	$\wedge E$	$\frac{A \wedge B}{A} \quad \frac{A \wedge B}{B}$
$\vee I$	$\frac{A}{A \vee B} \quad \frac{B}{A \vee B}$	$\vee E$	$\frac{A \vee B \quad A \rightarrow C \quad B \rightarrow C}{C}$
$\rightarrow I$	$\frac{\boxed{A} \dots B}{A \rightarrow B}$	$\rightarrow E$	$\frac{A \quad A \rightarrow B}{B}$
$\leftrightarrow I$	$\frac{A \rightarrow B \quad B \rightarrow A}{A \leftrightarrow B}$	$\leftrightarrow E$	$\frac{A \leftrightarrow B}{A} \quad \frac{A \leftrightarrow B}{B}$
$\neg I$	$\frac{\boxed{A} \dots B \wedge \neg B}{\text{contradiction}}$	$\neg E$	$\frac{A \quad \neg A}{\text{contradiction}}$



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Activity 3.3.

Final training in Oviedo



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Activity 3.3.

University of Oviedo



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Dr. Luis Jose Rodríguez Muniz



Dr. Noelia Rico



Dr. Susana Irene Díaz Rodríguez



Dr. Laura Muñiz Rodríguez

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF BANSKA BYSTRICA

Final Conference, Belgrade, October 9-11, 2022



Activity 1.3.

Exchange of experiences in B. Bystrica



Title:	Teacher training
Schedule:	17th – 20st May 2019
Topics:	Instruction on the use of electronic systems Presentation of online databases Support in preparing final thesis Support for the staff in research Support for handicapped students
Participants:	16 total (7 males and 9 females)

Activity 1.3.

Exchange of experiences in B. Bystrica



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Activity 2.4.

Webinar Basnak Bystrica



Title:	Teacher training webinar
Schedule:	16th – 18st December 2020
Topics:	Graphic tools in mathematics and life sciences Causality from non-experimental data Mobile applications for the collection of biological data in citizen science Mobile applications for plant species identification Constructivist approaches and the development of students' skills
Participants:	57 total

Activity 2.4.

Webinar Basnak Bystrica



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VISITOR – how does it work

Choose from menu (upload finding, profile, list of findings, settings)

Send finding immediately or later (with wifi connection)

Upload photos – botanists will control the identification with help of

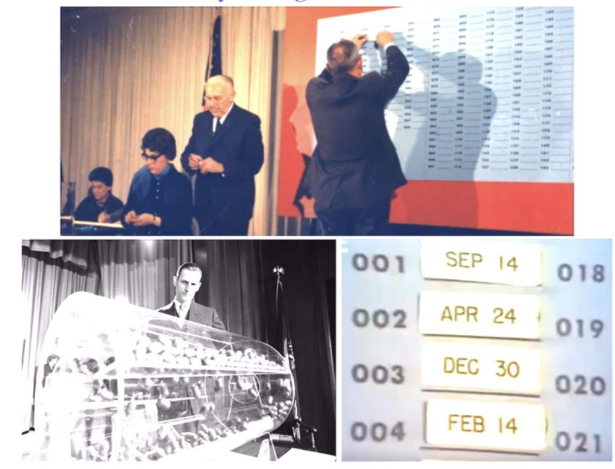
Upload findings: choose species, quantity, biotop, GPS – automaticly)

Is education worth it? (Angrist and Krueger, 1991)



Participants visible: Miroslav Čirić, Maja Stojanović, Luiz Seiti G..., Nebojsa (Guest), Andreja Tepavčević, Mir palla, Janis Vladimír, maric.miroslav, lorencekon...

Vietnam draft lottery (Angrist, 1990)



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Activity 3.3.

University of B.Bystrica in Novi Sad



Title:	Teacher training
Schedule:	20th – 23st March 2022
Topics:	Some good practices for students instruction Problems in mathematics university teaching Strengthening of the competencies of students at computer science Teaching of the biological subjects, their connection to research and practice Palynology – Use today to know the past Microbial ecology of water and soil Soft introduction into infinitesimal calculus
Participants:	26 total

Activity 3.3.

University of B.Bystrica in Novi Sad



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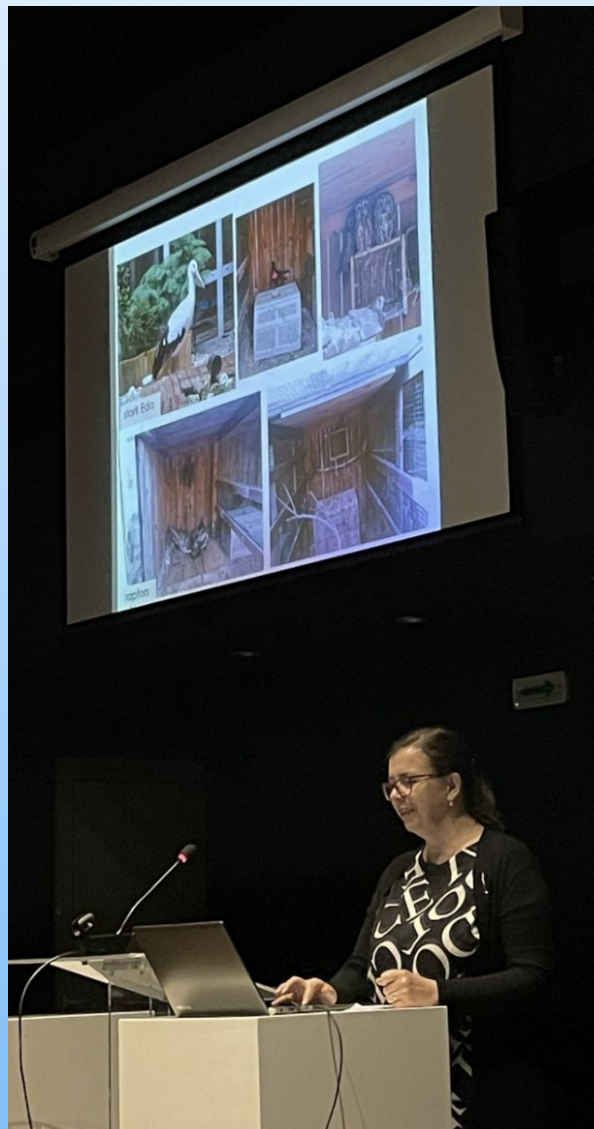
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Activity 3.3.

University of B.Bystrica in Novi Sad



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University of Basnak Bystrica



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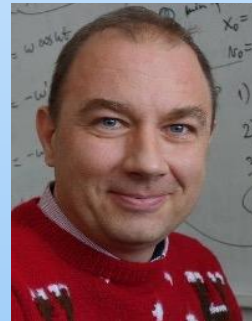
**Vladimír
Janis**



**Katarína
Trnková**



**Romana
Schubertová**



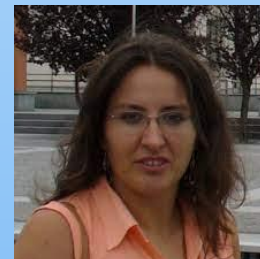
**Boris
Tomášik**



**Lukas
Laffers**



**Ingrid
Turisová**



**Alžběta
Michalíková**

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF
OSTARVA

Final Conference, Belgrade, October 9-11, 2022



Activity 1.3.

Exchange of experiences Ostrava



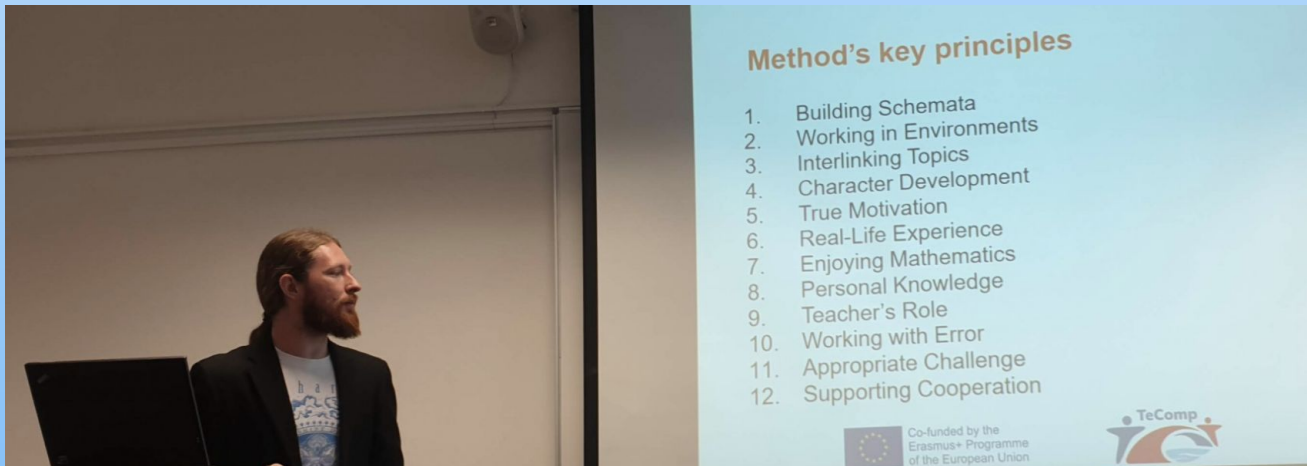
Title:	Exchange of experiences Ostrava
Schedule:	13th – 17th May 2019
Topics:	IRAFM laboratory: Fuzzy modeling in practice Innovative teaching methodologies in the Faculty of Science Genetic Constructivism in Mathematics - Hejny's Method Fuzzy modeling – Signature IRAFM Software products used in teaching and research Teaching "Formal set theory" with regard to students' comprehension
Participants:	16 total (7 males and 9 females)

Activity 1.3.

Exchange of experiences Ostrava



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Activity 1.3.

Exchange of experiences Ostrava



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Activity 3.3.

Training University of Ostrava in Niš



Title:	Oedagogical training
Schedule:	25th – 31st March 2022 in person
Topics:	Presented five lectures for the master study students and to the teachers as well.
Participants:	42 total



Activity 3.3.

Training University of Ostrava in Niš



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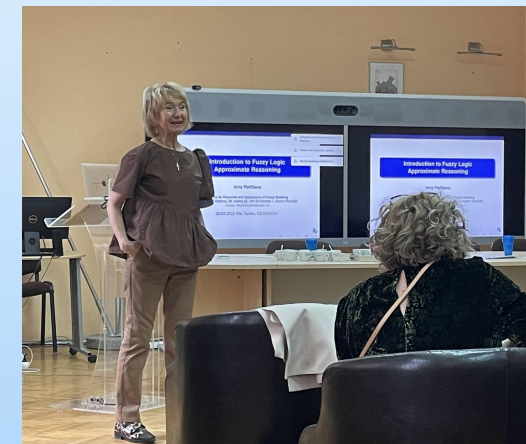
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Activity 3.3.

Training University of Ostrava in Niš



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Prof. Dr. Irina Perfilieva

Full Professor,
Institute for Research and Application of Fuzzy Modeling
University of Ostrava, Czech Republic



Prof. Dr. Petra Murinova

Associate Professor,
Institute for Research and Application
of Fuzzy Modeling,
University of Ostrava, Czech Republic



Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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

UNIVERSITY OF
Korçë

Final Conference, Belgrade, October 9-11, 2022



Activity 3.2 & Activity 3.3.

Training In Korçë



Title:	Training In Korçë
Schedule:	12th – 18th September 2021
Topics:	Modernization of teaching Preparing of teaching materials Using blended learning Flipped classroom Remote access laboratories
Participants:	26 teachers (UNI, UB, UNS, UNIKG, UNIKO, ECUG)

Activity 3.3.

Training In Korçë



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



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Activity 3.3.

Training In Korçë



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

Opportunities and challenges

How technology offers potential flexibility in

- what is learned,
- how it is learned,
- where it is learned.

Potential confusion

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

Training courses
University "Fan S. Noli", Korçe, Albania
September 16, 2023

Theorem prover Isabelle
in the teaching of natural and mathematical sciences

Full and optimal requirements

O'Halloran, K.L., Beezer, R.A. & Farmer, D.W. *A new generation of mathematics textbook research and development*. ZDM Mathematics Education 50, 863–879 (2018). <https://doi.org/10.1007/s11858-018-0959-8>

Remote Access to Chemical Analysis Instruments as a Toll For Work-Based Approach Within Chemistry Courses - Trial Presentation at University of Nis -

TATJANA ANDELKOVIĆ, IVANA KOSTIĆ
Department of Chemistry, Faculty of Science and Mathematics, University of Nis

Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences

TeComp Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences

Online teaching using MS Stream

Sibija Çobani
Department of Mathematics and Physics
Faculty of Natural and Human Sciences

VECTORS IN DINAMIC ENVIRONMENT

$\vec{OM} = 2\vec{i} + (-2)\vec{j} + (1)\vec{k}$, $\vec{ON} = 2\vec{i} + (1)\vec{j} + (2)\vec{k}$, $\vec{OP} = -1\vec{i} + (1)\vec{j} + (0)\vec{k}$

Minimum product
 $(\vec{OM} \times \vec{ON}) \cdot \vec{OP} = \vec{d} \cdot \vec{OP} = |\vec{d}||\vec{OP}| \cos(\angle(\vec{d}, \vec{OP})) = |\vec{d}||\vec{OP}| \cos(\angle(\vec{OP}, \vec{d})) = 30$

$V = 30$, $\alpha = 38.5^\circ$ $|\vec{d} = \vec{OM} \times \vec{ON} = -5.4\vec{i} - (2.8)\vec{j} + (8.6)\vec{k}|$

$(\vec{OM} \times \vec{ON}) \cdot \vec{OP} = \begin{vmatrix} 2 & -2 & 1 \\ 2 & 1 & 2 \\ -1 & 1 & 0 \end{vmatrix} = 30$

$\vec{b}_1 = 2.8$, $\vec{b}_2 = 1$, $\vec{b}_3 = 2.2$, $\vec{b}_4 = 1$

$\vec{b}_5 = 2$, $\vec{b}_6 = -2$, $\vec{b}_7 = 1$, $\vec{b}_8 = 1$, $\vec{b}_9 = 4$

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF
NIŠ

Final Conference, Belgrade, October 9-11, 2022



Activity 3.2.

PPM training in Niš



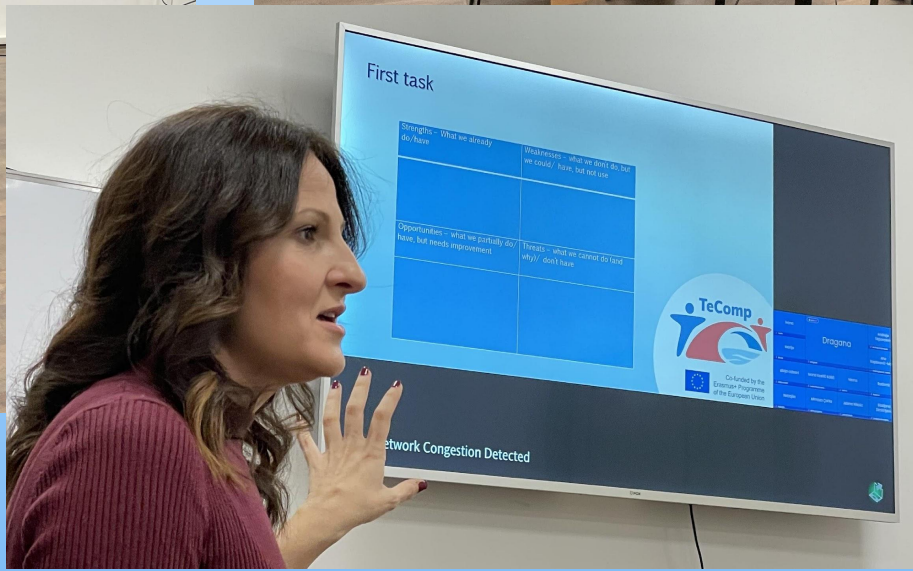
Title:	Pedagogical training for the teaching staff of Serbia and Albania
Schedule:	20th – 24th December 2021 in person and via Lifesize video-conferencing system
Topics:	1) Constructivism – theory behind practice 2) Combining traditional and contemporary methods in didactic and methodic modeling of teaching 3) Modalities of mental mapping method in lecturing and teachers' preparatory work 4) Effective pedagogical communication in higher education
Participants:	31 total (29 from Serbia and 2 from Albania)

Activity 3.2.

PPM training in Niš



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



First task

Strengths - what we already do / have	Weaknesses - what we don't do but we could / have, but not use
Opportunities - what we partially do / have, but needs improvement	Threats - what we cannot do (and why) / don't have

TeComp logo and Erasmus+ logo are visible in the bottom right corner of the screen.



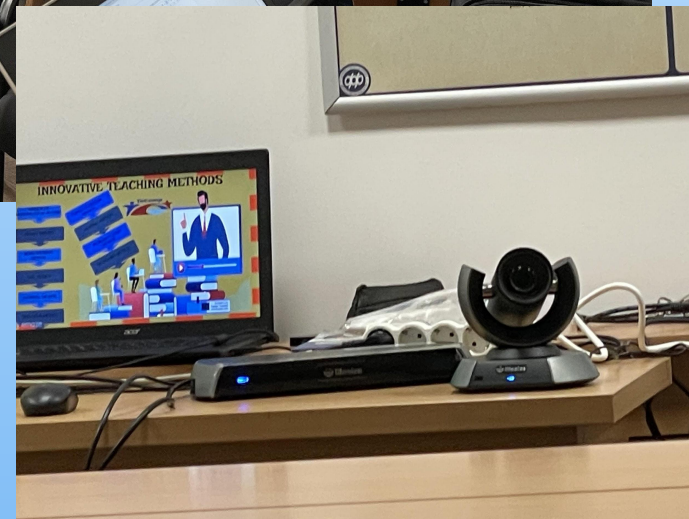
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Activity 3.2.

PPM training in Niš



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Activity 3.2.

PPM training in Niš



Co-funded by the
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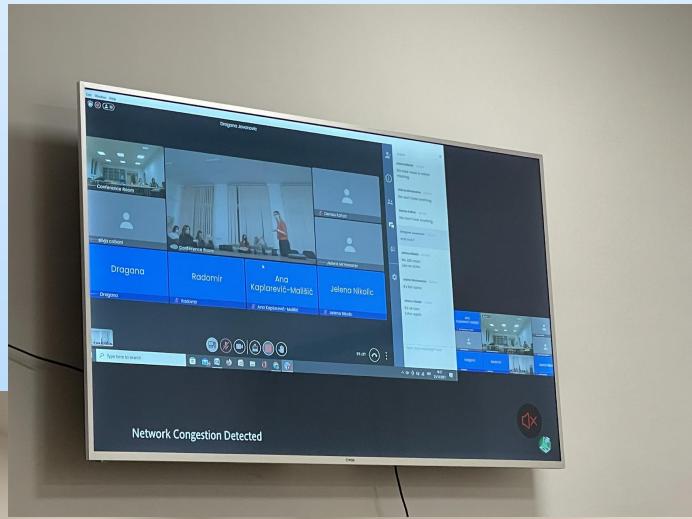
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Activity 3.2.

PPM training in Niš



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Activity 3.2.

PPM training in Niš



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The flowchart details the following steps:

- Determination of organic matter in water**
 - Sampling**
 - Choosing location
 - Preparing sampling bottle
 - Doing sampling
 - Choosing glassware**
 - 1. 100 mL Volumetric flask (2 pcs)
 - 2. 200 mL Erlenmeyer
 - 3. Glass (2 pcs)
 - 4. Pipette (3 pcs)
 - 5. Beaker (1 pcs)
 - 6. Burette (2 pcs)
 - 7. Hot plate (1 pcs)
 - Preparing standards**
 - Stock standards**
 - 1. 0.02 M $KMnO_4$
 - 2. 0.05 M $H_2C_2O_4$
 - Working standards**
 - 1. 0.002 M $KMnO_4$
 - 2. 0.005 M $H_2C_2O_4$
 - 3. 0.05 M H_2SO_4
 - Doing analysis**
 - Put 100 mL of sample into erlenmeyer
 - Add 5 mL of 0.05 M H_2SO_4
 - Put erlenmeyer on hotplate to boiling
 - When sample starts boiling put 15 mL of 0.002 M $KMnO_4$

DIMENSIONS OR CRITERIA	RUBRIC			WEIGHT	SCORE
	BELOW AVERAGE < 30%	AVERAGE	ABOVE AVERAGE >70%		
Define a DE and its solvability	Do not know do define DE or do not know conditions for existence of its solutions.	Define DE correctly and/or state some of the conditions for the solvability of DE	Define DE and formulate all conditions for the existence of its solution correctly.	30	
Solve the ODE of first order	Do not recognize the type of DE	Recognize type of ODE but do not know to solve it	Recognize type of ODE and solve it correctly	25	
Comment on the nature of the solution	Does not realize the difference of the solutions	Although he/she comments on the result, it is insufficient	Adequately generates all possible conclusions	15	
Identify the application of ODE and apply to relevant problem	Do not identify the application of the DE	Identify the application of the DE but do not know how to formulate equation correctly	Identify the application of the DE and apply correctly	30	

Centar za profesionalno usavršavanje
Center for Professional Development
Filozofski fakultet u Nišu
Faculty of Philosophy in Nis

SERTIFIKAT
CERTIFICATE OF ACHIEVEMENT

Ovaj sertifikat se dodeljuje
 This certificate is awarded to

Aleksandru Milenkoviću

U znak priznanja za uspešno ovladavanje dvonedeljne obuke
 In recognition for successfully accomplishing two-week training

Jačanje pedagoških i nastavnih kompetencija u visokoškolskim ustanovama
Strengthening Pedagogical and Teaching Competencies in Higher Education Institutions

A. Aleksandrović
 Upravnik Centra za profesionalno usavršavanje
 Head of the Centre for Professional Development

Prut
 Dekan Filozofskog fakulteta
 Dean of Faculty of Philosophy

February, 2022

TeComp

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

Activity 3.2.

PPM training in Niš



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of the European Union



prof. dr Jelena Petrović
Associate Professor, Department of Pedagogy,
Faculty of Philosophy, University of Niš



prof. dr Marija Jovanović
Associate Professor, Department of Pedagogy,
Faculty of Philosophy, University of Niš



prof. dr Dragana Jovanović
Professor assistant, Department of Pedagogy,
Faculty of Philosophy, University of Niš



Co-funded by the
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of the European Union

Activity 3.3.

Remote laboratories



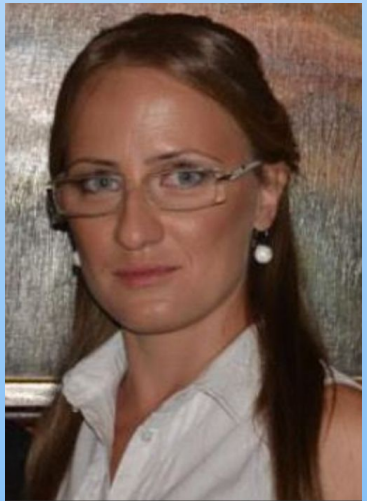
Title:	Problems and solutions in Chemistry Instrument Teaching by Remote Access Laboratories
Schedule:	13th April 2022
Topics:	1) What are Remote Access Laboratories (RAL)? Advantages of RAL (pros); 2) Disadvantages of RAL (cons); 3) How to organize RAL (Personal and Technical background); 4) How to organize class with RAL (needed time for the analysis, parameters selections to be controlled by students, samples selection); 5) Micro-class as example (5 minutes): lecture slides – demonstrator + instrument – AnyDesk chromatogram – slide conclusion.
Participants:	UNI, UNS, UB, UNIKO

Activity 3.3.

Remote laboratories



Dr Tatjana Anđelković,
Full Professor
Faculty of Sciences and Mathematics,
University of Niš



Dr Ivana Kostić Kokić,
Research Associate
Faculty of Sciences and Mathematics,
University of Niš

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF
NOVI SAD

Final Conference, Belgrade, October 9-11, 2022



Activity 3.2. & Activity 3.3.

Training at University of Novi Sad



Title:	Training for young teaching staff of University of Novi Sad
Schedule:	21st – 25th January 2022 online and last day face-to-face
Topics:	1) Where did the thirst for knowledge go? 2) Monitoring knowledge and student assessment 3) About textbooks and teaching materials 4) Visualization of problems using GeoGebra software 5) Visualization of problems using Wolfram Mathematica software
Participants:	35 total (20 females and 15 males) Younger assistants, assistants and assistant professors from the Faculty of Sciences, University of Novi Sad.

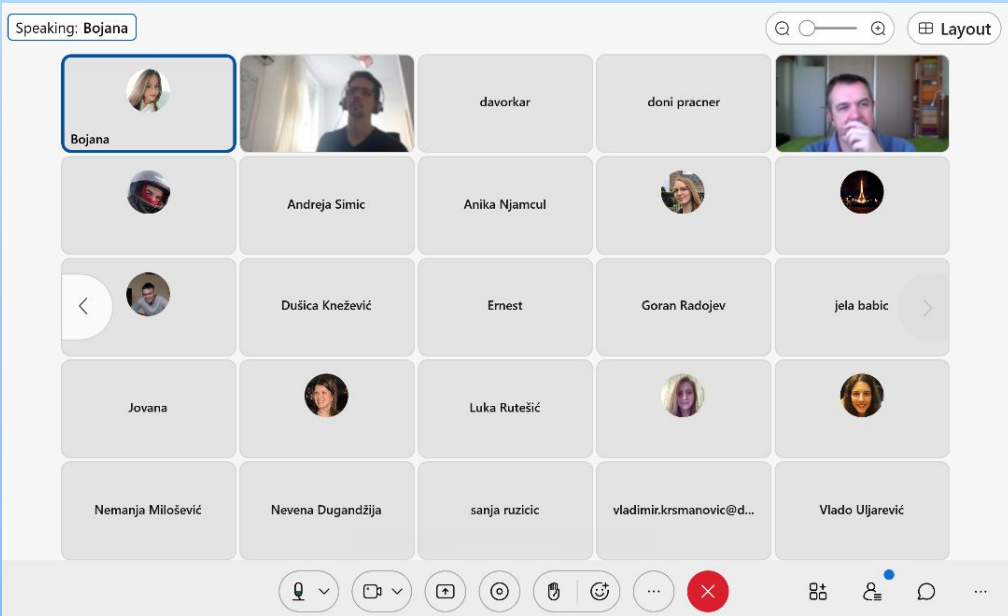
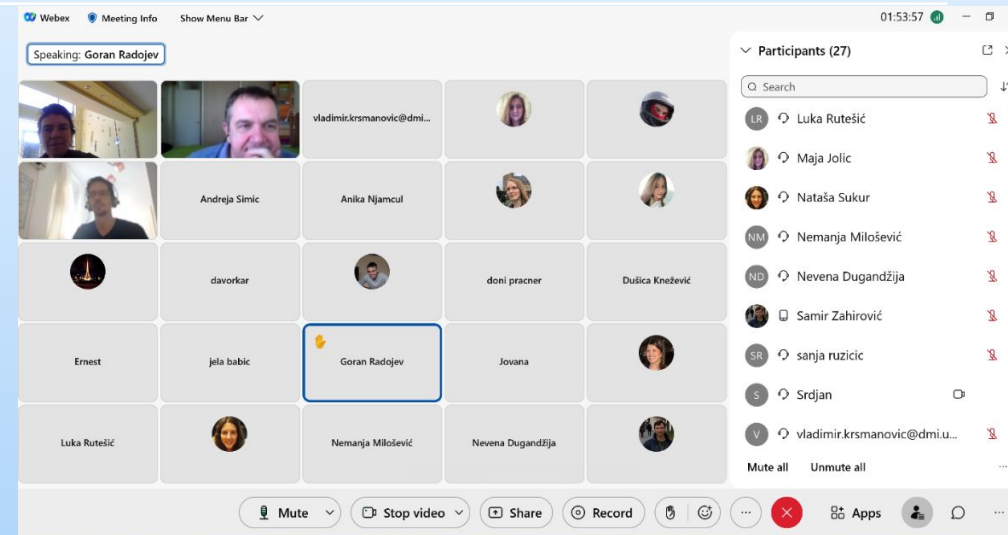
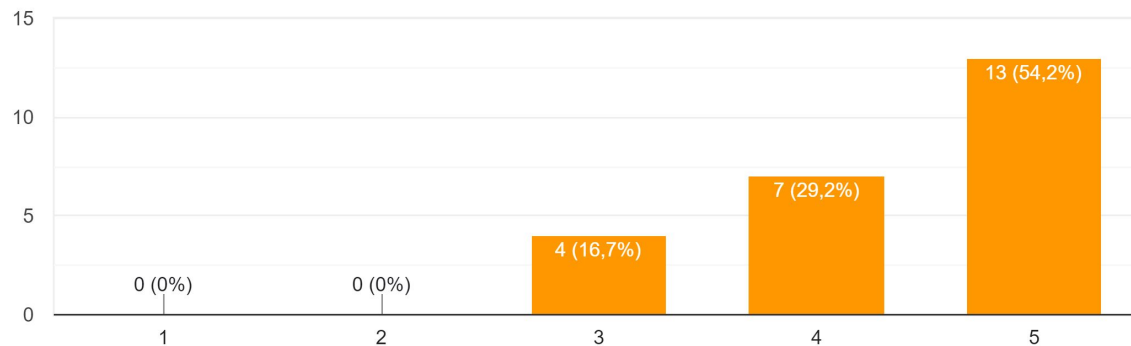
Activity 3.2. & Activity 3.3. Training at University of Novi Sad



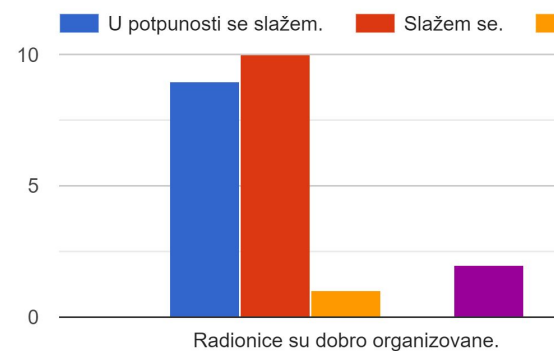
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Ocenite kvalitet video materijala kao uvodnog segmenta u radionicu.

24 odgovora



Ocenite kvalitet radionica.



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Training at University of Novi Sad



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of the European Union



prof. dr Dragan Mašulovic
University of Novi Sad



prof. dr Andreja Tepavčević
University of Novi Sad



prof. dr Zorana Lužanin
University of Novi Sad



prof. dr Goran Radojev
University of Novi Sad



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Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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UNIVERSITY OF
Kragujevac

Final Conference, Belgrade, October 9-11, 2022



Activity 3.3.

Training at University of Kragujevac



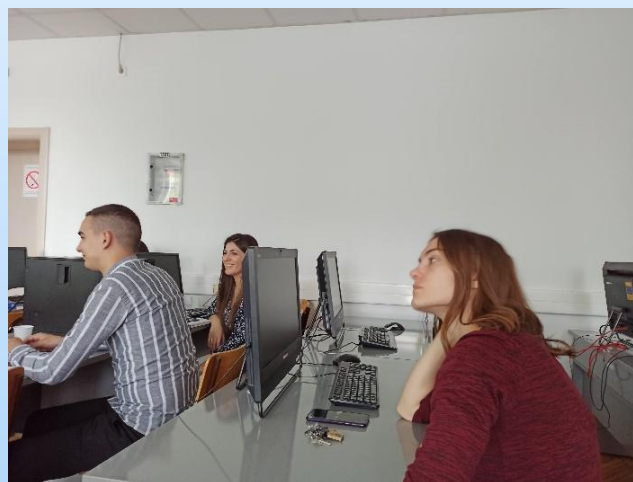
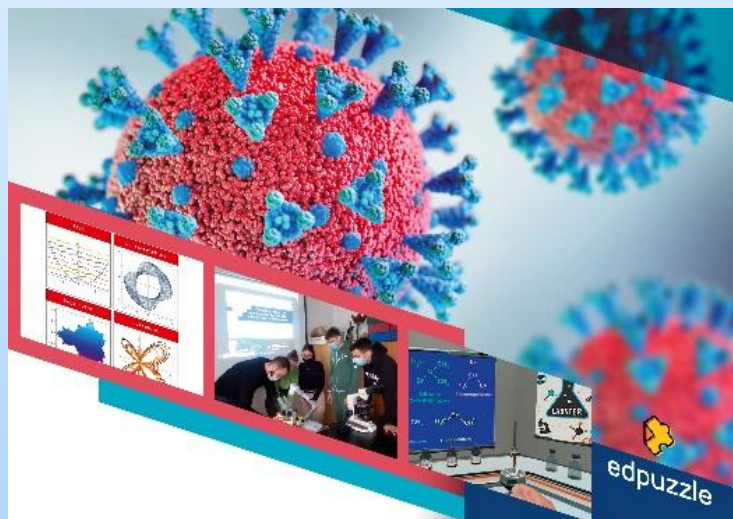
Title:	University Teaching – Can it be more efficient?
Schedule:	28th April 2022 - Face to face workshop 29th April 2022 – Online consultations 9th May 2022 – Online consultations 23th May 2022 – Online presentation of Workshop results and evaluation
Topics:	12 topics 11 University teachers
Participants:	50 total (University teachers and researchers)

Activity 3.3.

Training at University of Kragujevac



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УНИВЕРЗИТЕТСКА НАСТАВА – МОЖЕ ЛИ ЕФИКАСНИЈЕ?

ИЗАZOVI СAВРЕМЕНЕ НАСТАВЕ ПРЕ,
ТОКОМ И ПОСЛЕ ПАНДЕМИЈЕ

- Драге колегице и колеге,
Позивамо вас на **СТРУЧНИ СЕМИНАР** у организацији
тима ЕРАСМУС+ пројекта TeComp. Циљ семинара је:
- да пружи кратак али информативан преглед иновативних наставних метода и употребе ИКТ у настави природних наука, математике и рачунарства, као и
 - да организује дискусију о искуствима наставе на даљину и евентуалним променама које смо увели или ћемо трајно увести у наш рад услед тог искуства.



28. 04. 2022.



ПРИРОДНО-
МАТЕМАТИЧКИ
ФАКУЛТЕТ

Семинар ће се одржати на ПМФ-у
у четвртак 28. априла.
Више о програму семинара и пријави за
семинар можете наћи путем датог QR кода.



Strengthening Teaching Competences
in HE in Natural and Mathematical Sciences
598434-EPP-1-2018-1-RS-EPPKA2-CBHE-JP



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Erasmus+ Programme
of the European Union

Activity 3.3.

Training at University of Kragujevac

Section for biology and ecology

1. Ivana Radojević, *Applications of selected digital tools and web resources in teaching of biology*
2. Snežana Branković, *Use of EPSON camera as a tool for improving teaching of botanic*

General part

At the end of this part of Workshop open **panel discussion**, with theme *Have we learn something new about teaching during pandemic?* was organized.



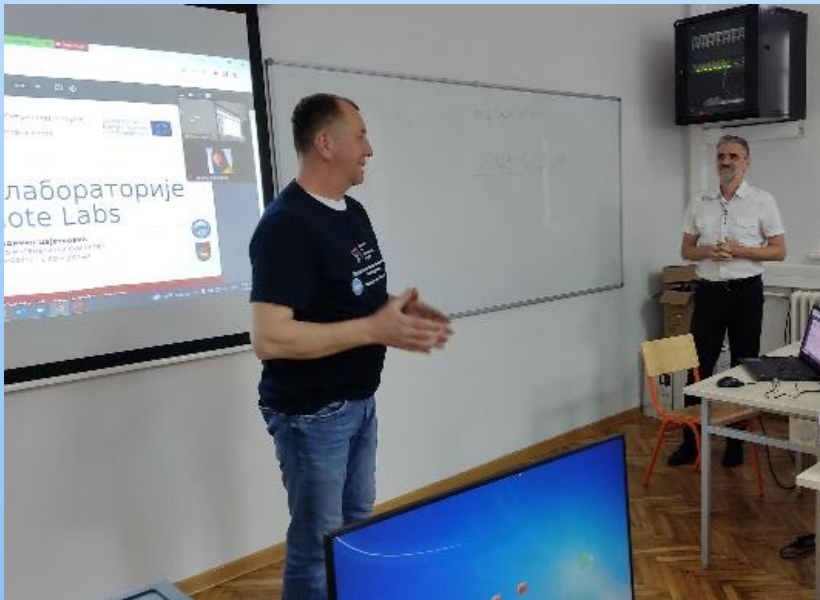
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Activity 3.3.

Training at University of Kragujevac

Section for physics and chemistry

1. Vladimir Cvjetković, *Remote online laboratory in teaching of physics*
2. Jelena Đurđević Nikolić, *Use of virtual laboratory in teaching of chemistry*
3. Milan Kovačević, *Vision for use of experiments in teaching of physics in 2050*



Section for mathematics and informatics

1. Aleksandar Milenković, *Possibilities for use dynamic software GeoGebra in HE teaching*
2. Tatjana Tomović Mladenović, *Improvement of teaching by using software Wolfram Mathematica*



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Activity 3.3.

Training at University of Kragujevac



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АБ ТОКСИНИ - неуротоксини

Тетанусни токсин - *Clostridium tetani*

Спречава ослобађање инхибиторних неуротрансмитера (глициналне производње ацетилхолина) и спазам парализу.



Organisms enter through large, small, or even unrecognized wound. Deep, infected punctures are most susceptible, since organisms thrive best anaerobically.



Strengthening Teaching Competences
in Higher Education in Natural and
Mathematical Sciences

Co funded by the
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Univerzitet u Kragujevcu
University of Kragujevac
Prirodno-matematički fakultet
Faculty of Science



Univerzitet u Kragujevcu
Prirodno-matematički fakultet

SERTIFIKAT

CERTIFICATE OF ACHIEVEMENT

Ovim sertifikatom se potvrđuje da je
This certificate acknowledges that

Dragana Krstić

USPEŠNO SAVLADALA PROGRAM STRUČNE OBUKE
HAS SUCCESSFULLY COMPLETED THE TRAINING PROGRAM

*Univerzitetska nastava - Može li efikasnije?
University Teaching - Can It Be More Efficient?*

Prof. dr Jelena Ignjatović
Koordinator ERASMUS+ projekta TeComp
Coordinator of ERASMUS+ project TeComp

31st May 2022

Prof. dr Marija Stanić
Dekan Prirodno-matematičkog fakulteta
Dean of Faculty of Science



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Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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Activity 3.4. Training for teaching and academic writing in English

Final Conference, Belgrade, October 9-11, 2022



Activity 3.4.

TAWÉ



Title:	The course teaching and academic writing in english for natural and mathematical sciences (TAWÉ)
Schedule:	3rd – 23rd March 2022 6 online Zoom sessions, each lasting 3 hours
Assessment and feedback:	University of Niš 11-14th April 2022, University of Belgrade 27th May 2022, University of Novi Sad 28th May 2022 University of Kragujevac 10-11th June 2022, University of Gjirokaster and University of Korce 15-16th June 2022.
Participants:	116 total (33 male and 83 female)

Activity 3.4.

TAWE



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BESPLATAN ONLINE KURS ENGLESKOG JEZIKA

Kome je kurs namenjen?

Usavršavanju nastavnik kompetencija **nastavnika i saradnika prirodnih nauka i matematike.**

Kako je kurs koncipiran?

Kurs će se sastojati iz **šest sesija**. Svaka sesija će biti u trajanju **od tri školska časa** (po 45 minuta)

Koji su termini održavanja kursa?

Sesije će biti održavane u terminu **od 18:00h do 20:30h** datumima:

- 4. mart 2022. god.
- 9. mart 2022. god.
- 11. mart 2022. god.
- 15. mart 2022. god.
- 18. mart 2022. god.
- 23. mart 2022. god.

Ko su predavači na kursu?

Predavači na kursu biće sa Filozofskog fakulteta u Nišu:

- **Biljana Mišić Ilić**, redovni profesor
- **Jasmina Đorđević**, vanredni profesor
- **Nikola Tatar**, nastavnik stranog jezika

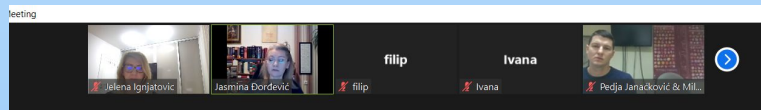
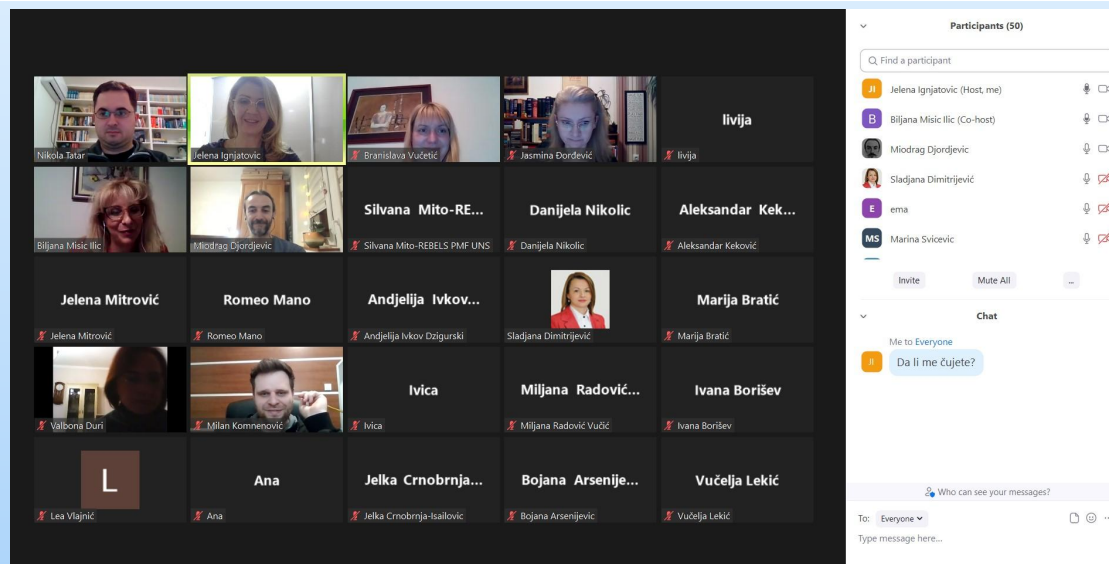
Kako se prijaviti?

Svi zainteresovani, mogu se prijaviti na mail: **tecomp.p2018@gmail.com**

Za prijavu na kurs nije potrebno polagati nikakav ulazni test.

I još?

Nakon 6 online sesija, biće organizovane i dve sesije posvećene **mikronastavi i pisanju sažetka**. Ove sesije će biti organizovane uživo u: Nišu, Kragujevcu, Novom Sadu i Beogradu.



Types of academic writing in an IMRAD-based academic text

Descriptive

Methodology section to summarize methods
Results section to report on the data collected

Analytical

Results section to present relevant relationships between findings
Analysis section to elaborate on relationships and present conclusions



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Activity 3.4.

TAWÉ



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Focus on writing articles

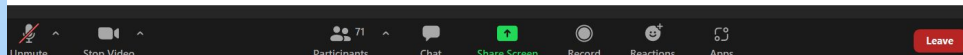
I – Introduction contextualizes the research, provides a presentation of the theoretical background, informs of the value of the research – How is it different? How is it new?

M – Methodology describes how the research was conducted, tells about the methods, approaches, techniques, instruments, sample, participants, time, place, etc.

R – Results section presents the findings qualitatively and/or quantitatively depending on the research design.

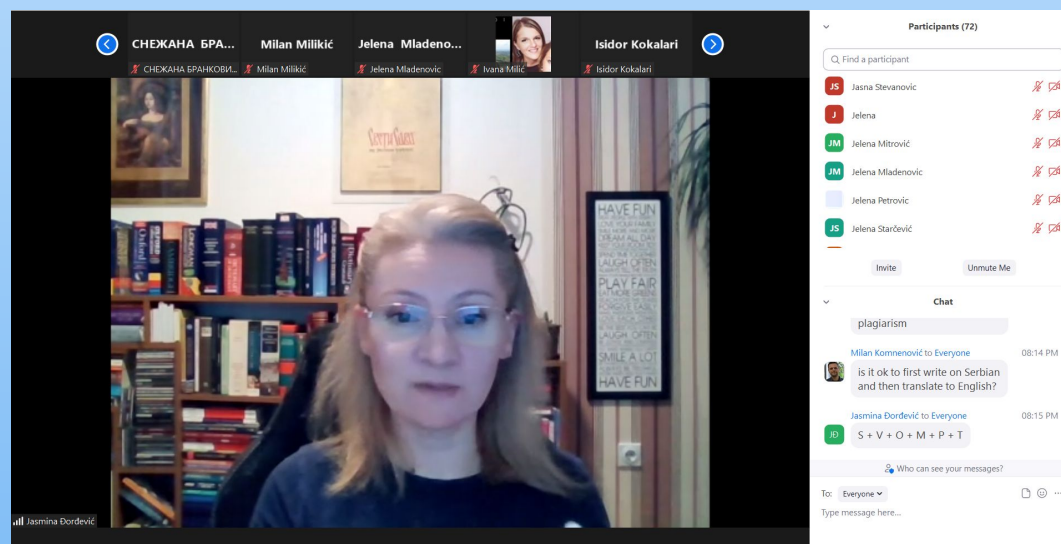
A – and

D – Discussion offers a detailed analysis of the relationships between the results, provides a presentation of how the findings confirm/don't confirm the hypothesis, explains whether initially set research questions have been answered, displays limitations, indicates implications and offers a concluding remark.



*“Uses promptos facit.”
Practice makes perfect*

- PROVERB



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Activity 3.4.

TAWE



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University of Niš Faculty of Science and Mathematics

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

TeComp

Certificate

OF COMPLETION

THIS IS TO CERTIFY THAT

Aleksandra Arsenijević

Has satisfactorily completed the Erasmus+ CPD course "Teaching and academic writing in English" with three hours of lectures during six weeks, in the period: 04/03/22 to 23/03/22, organised by the University of Niš, Faculty of Sciences and Mathematics, Center for Professional Development and Erasmus+ project TeComp - Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences.

This course has been organised in the framework of European Erasmus+ Programme.

Dr Jelena Ignjatović
Course coordinator

Dr Niko Radulović
DEAN

University of Niš Faculty of Science and Mathematics

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

TeComp

Certificate

OF COMPLETION

THIS IS TO CERTIFY THAT

Dušan Đorđević

Has satisfactorily completed the Erasmus+ CPD course "Teaching and academic writing in English" with three hours of lectures during six weeks, in the period: 04/03/22 to 23/03/22, organised by the University of Niš, Faculty of Sciences and Mathematics, Center for Professional Development and Erasmus+ project TeComp - Strengthening Teaching Competences in Higher Education in Natural and Mathematical Sciences.

This course has been organised in the framework of European Erasmus+ Programme.

Dr Jelena Ignjatović
Course coordinator

Dr Niko Radulović
DEAN

Activity 3.4.

TAWE - Instructors



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of the European Union



Dr Biljana Mišić Ilić, Full Professor
Faculty of Philosophy, University of Niš



Dr Jasmina Đorđević, Associate Professor
Faculty of Philosophy, University of Niš



Nikola Tatar, M.A., English language instructor
Faculty of Philosophy, University of Niš



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Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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of the European Union

Activity 3.5.
**Development of structure
and content of courses
for students and
young teachers**

Final Conference, Belgrade, October 9-11, 2022



Activity 3.5.

LearningKey platform



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



Sign in

Enter your log in credentials and start learning.

Username

Password

[Forgot password](#)

[About us](#) [Privacy policy](#)



Activity 3.5.

LearningKey platform



Math & Comp Science

REQUIRED SUBJECT FORM FOR

DATA STRUCTURES AND

MATHEMATICS 1

MATHEMATICS 2

VIEW

VIEW

VIEW

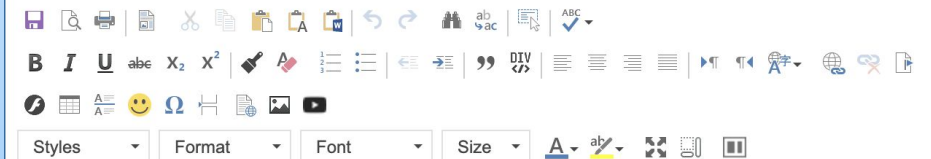
VIEW

LINEAR ALGEBRA

DESIGN AND ANALYSIS OF

DISCRETE STRUCTURES I

CRYPTOGRAPHIC ALGORITHMS



Name of the subject: Cryptographic algorithms

Name of the study programme: Computer Science

Level of the study (BSc/MSc/PhD): MSc

Elective or obligatory: Elective

ECTS: 7

Number of students: 1

Assistant Professor: Jelena Matejić

E-mail of assistant professor: jelena.matejic@pmf.edu.rs

Name of the lecture that is/will be modernized: complete course

Activity 3.5.

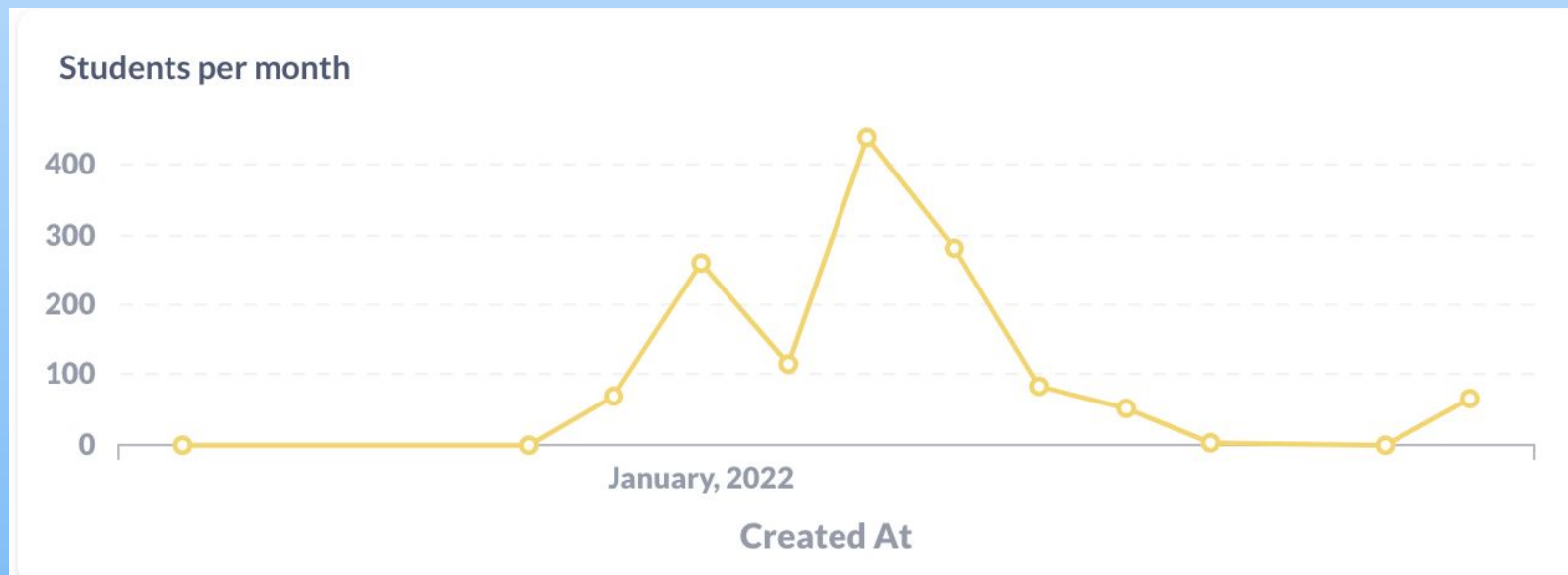
LearningKey platform



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of the European Union

Number of inovated courses:	40+
Number of teachers who used platform:	114
Number of students who used platform:	3202
Number of universities:	6

P1 - University of Niš	33
P2 - University of Belgrade	7
P3 - University of Novi Sad	17
P4 - University of Kragujevac	23
P5 - Eqrem Çabej University Gjirokastër	9
P6 - Fan S. Noli University Korçe	25



Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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Activity 3.6.
**Approval/Accreditation of
new/modified master study
and continuing professional
development courses**

Final Conference, Belgrade, October 9-11, 2022



Activity 3.6.

Accredited courses



Accredited course for lifelong learning:	Teaching and academic writing in English
10 accredited courses at UNI:	<ul style="list-style-type: none">• Methodology of teaching• Methodology of e-learning• Interactive tools• Digital media in blended learning• Interactive tools for online teaching and exams• Virtual classrooms• Methodics of teaching in informatics• Development of platforms for blended learning• Pedagogical practice• Didactic-informatics innovations
Study program UNS:	Doctoral Study Programme in Teaching Methodology of Natural Sciences

Strengthening Teaching Competences
in Higher Education
in Natural and Mathematical Sciences



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Activity 3.7. Implementation of approved courses

Final Conference, Belgrade, October 9-11, 2022



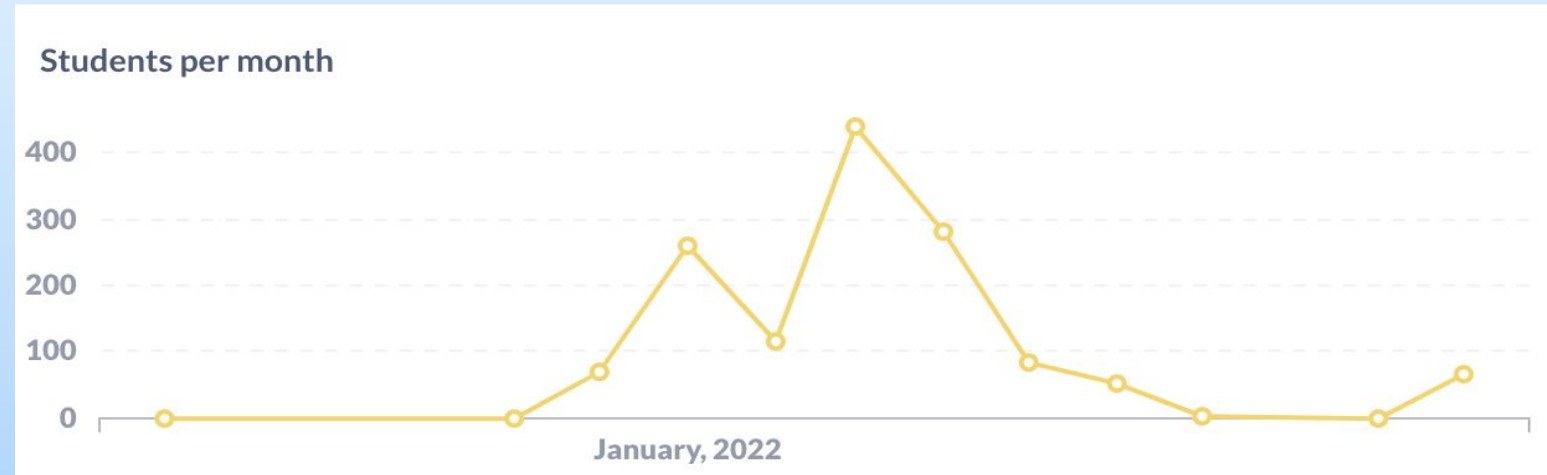
Activity 3.7.

Implementation of approved courses



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Inovated courses:	40+
Teachers:	114
Students:	3202
Universities:	6



Groups:

+ Add new group

I group - Multime... 48	DSA 42	Pedagogy 0	Master studije he... 0
Discrete structur... 76	Web programming 56	Linear Algebra 32	SubUserGuide 0
Introduction of d... 44	The methodolog... 5	Design and Analy... 101	Linear Algebra - ... 59
Mathematics 2 75	Linear Algebra (... 36	Advanced Enviro... 10	Advanced Enviro... 11
Pedagogy_histor... 98	Andragogy 43	Didactics 2 38	Pedagogy (secon... 115
History of pedag... 51	MATHEMATICS ... 67		



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Strengthening Teaching Competences
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Thank you!

Jelena Matejić

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University of Niš, Serbia

Final Conference, Belgrade, October 9-11, 2022

