



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

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



ANNEX II to the quality report

NEW WORK PLAN

Additional information about the project based on European Commission recommendations and requests

The Covid-19 pandemic hit us very hard, with almost every one of us in Serbia falling ill or being around infected people and, sadly, one of the members of the project team, professor Zoran Stankovic from the University of Nis, lost the battle. Due to Covid-19 pandemic, we were unable to resolve foreseen project activities in person, thus we had to resort to the online learning methods. At first, we were skeptical about how that change would influence the effectiveness and quality of these activities, but we are happy to report that the results were more than satisfactory. Many bachelor and master courses at PC universities were forcibly modernized to fit the new requirements and a large number (about 500) of students have filled a questionnaire about their views on the current methods of T&L.

Updated workplan adapted to the Covid situation

Please, keep in mind that the TeComp project consortium had reached a decision to request an extension of the eligibility period.

WP2 Upgrading educational infrastructure at the PC HEIs

Covid-19 had prevented us in progressing further from the planning stages for Activities 2.2 and 2.4.

The tasks of Activity 2.2 are related to preparation of printed and electronic material for psychological, pedagogical and methodology (PPM) training courses.

Originally, what we had in plan was for a few people from Serbia and Albania to travel to Granada and Ghent to get acquainted with their expertise and the skills they use in education. The training materials would then be made by the usage of their newly broadened knowledge. Instead of going with this approach, we were forced to organize the planned activities through webinars. We used many online platforms, such as Google Meet and Microsoft Teams. Since almost all the physical boundaries were lifted by this new method and the interest for the lectures which were presented by teachers from Granada was remarkably high, a large amount of people (around 60) was given the opportunity to participate in the Webinar, which took place from 2nd to 4th of December.

In addition to this, two other webinars about the usage of modern technologies in teaching and learning were held. The first was organized by the experts from Oviedo lasting for three days (December 9th – 11th) and the other one given by teachers from Banska Bystrica, starting on December 16th until December 18th.

The final planned webinar, related for the preparation of training material, will take place in January 2021 and the content of it has already been constructed.

Judging by the comments and what was written in the evaluation form the outcomes of the webinars were found to be satisfactory and useful to all participants. It seems that we drastically raised the



awareness of the necessity to strengthen teaching competences in Serbia and Albania. Some of the attendants will start implementing the presented methods in their classes to elevate their cooperation with students immediately. Some teachers and assistants are not able to realise the importance of the usage of modern methods and technologies in education yet, since we are still far away from real online education. The detailed evidence regarding this will be available after all the Webinars are finished, along with the number of students impacted by the changes to these classes.

The final stage of the preparation of guidelines and instructions for the wider integration of ICT, as well as the usage of modern PPM methods in teaching and learning will be finished in accordance with our plan before the end of March 2021. Originally, Serbian and Albanian teachers were supposed to travel to Ghent, Granada, Oviedo and Banska Bystrica, but this plan never came into fruition due to the pandemic. Instead, division into teams populated by the professors of the same field of science, from Serbia and Albania, is planned in this stage. To successfully finish the preparation of the material, team members will be traveling between universities in their respective countries, if possible. Travel costs for this activity will be covered from the funds originally meant to be used for travelling during these activities. All materials will be available in English, Serbian and Albanian.

The adaptation of the material developed to increase English proficiency during the project FUSE (which was coordinated by the University of Nis) is nearing its end.

WP3 Professional development of teaching staff

The first series of training courses will be organised at the PC HEIs and the trainers will be teachers of PPM from these HEIs. Due to the situation with the pandemic it is not sure whether these trainings will be organized face-to-face or online. We hope that the completion of this activity could be achieved during late April or early May 2021.

In the second series of training courses, it was planned that instructors from UGENT and UGR visit PC universities and teach Serbian and Albanian trainees separately. The only solution, in these circumstances, is to organize trainings simultaneously to trainees from Serbia and Albania by using online tools and apps. These lectures will be monitored via online applications and video conference by all of the participants. This series was supposed to happen after the first one, according to the original project description, but, since the way of working has changed due to COVID-19, there is a possibility that some overlapping may occur. Coordinator from Ghent has already made a proposal, which states that training given by their experts would take place once a week, for a duration of 3 months, starting February 2021. All in all, this activity should be finished during the first half of July 2021. The third series of training courses was designed to give young university teachers and assistants who faired the best in the previous two activities an opportunity to visit Granada and attend more advanced courses. The resolution of this activity will play out as intended if the situation until the end of October 2021 allows it. If that is not the case, these courses will be organized as a mentor work monitored by experts from Granada. The afore-mentioned teachers and assistants would have a crucial role to play in enhancing modernisation of teaching and learning methods and tools at PC HEIs. Activity 3.3, which focuses on strengthening teaching competences and



usage of modern technologies, is planned to be realized in the same fashion at a similar time (almost simultaneously). The trainings, which are to be featured in this activity will be held by teachers from UNIOVI, UMB and UO. The best students will travel to Oviedo or be monitored by mentors from Oviedo, depending on what fate has in store for us. Hopefully, if this also goes as planned, it should end by the end of September as well.

Trainings designed to increase proficiency in the English language will be organized online by the teacher from University of Nis to all PC HEIs before the end of June 2021.

The lectures based on the prepared material will be organized at the faculties of partner institutions in order to raise students' awareness about the importance of active involvement in classes, rather than just passive listening, as well as about the necessity of the modernization of teaching and learning.

TeComp project has, in cooperation with Educational forum from Belgrade, created a questionnaire about the students' opinions on the quality of online teaching and learning. Over 500 students, all-across Serbian universities, participated and the results can be expected to come within the next two months.

In the scope of the third work package the curriculum development was planned and details of on-going activities for the curriculum development are included below, **as requested by EACEA**.

Almost all subjects at PC HEIs were forcefully modernised due to the necessity for usage of various online applications and tools brought by the pandemic. Thanks to this, teachers have already acquired some experience and improved their proficiencies in the usage of contemporary teaching methods. These forced changes of teaching and learning methods, clearly, do not represent the real online teaching and we are aware that our teachers need to be trained in the application of new methods and modern technologies in teaching.

Most of the teachers involved in the project are already ready to modernise their faculty courses by implementing PPM methods and open-source educational software in the field of natural sciences and mathematics, which they got acquainted with through the webinars held in December 2020. Through constant communication via mail and other social networks, the contents of these subjects were designed and sent for regular accreditation process at the Faculty of Sciences and Mathematics, University of Nis. We expect this process to be finished until the end of May 2021, which would place the starting time of the new programme at the October 2021 mark.

These new courses are planned to be introduced on both bachelor and master study programmes. These are as follows:

- Interactive tools for online learning
- Digital media in blended learning
- Development of platforms for blended learning
- Virtual classrooms
- Modern didactic principles
- Education of children and adolescents with special needs



- Innovations in teaching
- Educational software

The preparation of the material for the accreditation of Doctoral academic studies Methodology in the field of natural sciences, mathematics, and informatics, is going strong at the University of Novi Sad. The experiences gained through communication with EU partners were adjusted to the needs of education in the Republic of Serbia and are used for the re-accreditation of the doctoral studies (first ones currently) in the field of teaching methodology in natural sciences and mathematics. We single out items that directly correspond to new requirements:

- Multimedia technology in teaching
- Testing and knowledge check
- E-learning and distance learning
- Usage of modern ICT in teaching
- Didactic-methodical research in mathematics teaching
- Modern teaching tools
- Educational software

The final decisions of the academic council of the Faculty of Sciences and Mathematics and the Senate of the University are expected to be adopted by the end of December 2020, material will be sent to the accreditation commission during January 2021 and the expectations are that the first generation of students enroll the new study programme in October 2021.

The introduction of similar courses, at the academic studies of the Faculty of Physics in Belgrade, is also planned (the preparation of documents for their regular accreditation process is starting soon).

December 2020 marked the beginning of the process of formation of Center (platform) for development of the education of natural sciences, mathematics, and computer sciences at the UNS. This virtual platform will be used by all partners in Serbia and Albania and it will contain material designed to be used by teaching staff on all levels of study with the special highlight on cross-course competences and requirements of the 21st century. The platform will be available for all teaching staff to use as early as March 2021.

The modernization and upgrading of the existing courses from the didactically-methodological group of subjects will be implemented at all PC HEIs. The academic council of the corresponding departments at Faculty of sciences in Kragujevac adopted these modernized courses as incremental changes of plans and study programmes. Novi sad will follow soon.

Novi Sad:

- Methodology of mathematics 1
- Methodology of mathematics 2
- Contemporary educational tools
- Research in education
- School practice 3

Kragujevac:

- Educational software
- Innovations in mathematical teaching

Numerous other courses will be changed by the implementation of new methodologies and tools in all partner universities in Serbia and Albania starting the next semester. A list of these courses will be available on the platform, as well as the project website will be available before February 2021.

The early number of students who will attend these modernized courses will be shown, based on the number of students registered for each course, very soon.

As we have previously mentioned, online technologies were integrated into a significant number of traditional courses at PC HEIs. Forced by the urgent circumstances, most of the university teachers have already started using online technologies and realised the benefits of doing so.

WP4 The formation of online learning environment

Each university in Serbia and Albania, according to specific needs of education, is suggested the suitable online learning platform that is used as a basis for designing new technology-enhanced courses, during last year. A team of experts in information technology have started the adaptation of the platform “**LearningKey**” (<https://info.learningkey.app/>) to the project needs, and later, to the special requirements of teachers and courses in the field of natural and mathematical sciences at PC HEIs. On this platform, the impact of the project on the number of students attending the modernized courses over time, both during and after the project life, will be clearly visible. The use of this online learning platform should allow students to access the learning materials easier and faster at any time. Pilot courses will be recorded and launched on the platform before July 2021. An electronic testing system has been created by using Google and Microsoft Teams forms. The self-testing questionnaires created by the professors at PC HEIs in the field of natural sciences and mathematics will be uploaded to the “**LearningKey**” platform, which will enable students to manually check their knowledge wherever they are, even on the go.

Some pilot courses (projects), for the integration of online technologies into a certain number of traditional courses at the PC HEIs in all areas of natural and mathematical sciences, will be launched to the platform. The role of these pilot projects is to demonstrate the benefits of using online technologies in T&L.

A very important part of higher education is student evaluation. Electronic testing is one of the ways to improve this aspect of higher education, and in the corresponding activity, systems for electronic testing of students are starting to be developed and they will be implemented as a part of the LearningKey platform. A team of experts in information technology, and pedagogy from the partner institutions in cooperation with EU experts in particular subjects, will propose methodological and software solutions for the development of systems for electronic testing and monitor the creation of these systems. Questions on the tests will be randomly chosen from the database of questions (for each student individually) that will be created as early as October 2021.

Laboratory exercises often require complex and expensive laboratory equipment, and many higher education institutions are not able to provide enough quality equipment, which represents a significant



handicap for the students of these institutions. When higher education institutions are ready for cooperation, this problem can be solved by using online technologies which will enable students to participate in experiments from remote locations. The equipment necessary for the realisation of this activity is purchased from the project budget. Teachers who plan to integrate online technologies into their laboratory exercises proposed hardware and software solutions and pilot projects for the integration of online technologies into a certain number of laboratories at the PC HEIs will be launched.

WP5 Quality assurance and monitoring

The preliminary analysis which will be the first step in the further analysis of performance indicators of the innovations introduced in the process of teaching and learning at the PC HEIs, will be realised before March 2022 (with hope that EACEA extends the project deadline because of COVID-19 situation which greatly increases the difficulty of project activities). The analysis will be continued after the completion of the project cycle.

Qualitative reviews are planned to be conducted twice a year, based on the internal QA reports presented by WP leaders to the QAMB (Quality Assurance and Monitoring Board) and UNIKO (University of Korca). All the reports were not achieved on time due to difficulty of cooperation, but all the partners are regularly informed about the issues related to project quality. Once we got used to the situation the work is greatly improved, and all the planned activities are re-arranged and re-defined.

In order to get an external feedback of the project, inter-project coaching will be organized with NETCHEM project, which was finished in July 2020, for mutual exchange of accumulated expertise. If the situation allows, the meeting will be held live, and in that case, with the aim of saving the money, it will be held at the same time as a LCT meeting. On the other hand, if necessary, it will be organised through video conferencing.

Quality control of the project activities and results is planned to be performed both at the mid-term and at the end of the project life, by an expert who will establish independent comprehensive monitoring evaluations. Since collecting partners' documents was very difficult, due to the working conditions during the last year, the financial revision is agreed to be performed in January 2021.

WP6 Dissemination and exploitation

In order to ensure the dissemination of information, the project website was created, maintained and regularly updated. Sadly, the COVID-19 pandemic left us without any tech support for a long time (a person charged with this duty came down with the virus and resigned from his position) and even though we are now back and working at full force, the newly redesigned version of the website still has a few holes to be patched. The project administration platform was, at points, updated manually by both us and partners, but all in all it had suffered a similar treatment. We are happy to report that this issue is solved now, and that the platform also gets regularly updated (we are still waiting for a few signed documents, which are to be provided by our EU partners though).



* *Due to the request from EACEA, the platform is now accessible under the **username: EACEA** and password: **TeComp!2021** .*

Besides the website, we have designed promotional materials in the form of leaflets, flyers, booklets, files, plastic bags, diaries, bumpers, posters, and bios. Once the last phase comes to an end, the training materials will also be printed and made available on the websites of PC universities. The promotional material will be distributed to all project stakeholders via online and in-person promotional presentations and at the planned workshop (we have not yet decided on if it will be held online or not), as well as videos.

The joint reports of the project activities have been created and they are available at the project website and will be distributed at next planned promotional opportunities.

One of the main goals of the project is to raise awareness among teaching staff in PC HEI's about the necessity and positive effects of using online learning. For most teachers, this has already been achieved, in which a significant role was played by the shift from classical face-to-face classes to remote teaching in our HEI's, in response to Covid - 19. However, in emergency circumstances, that shift was most often too sudden, without enough time for serious preparations, which led to an emergency remote teaching that is essentially different from the design and delivery of courses that were always intended to be delivered online. In the scope of WP6 we plan some additional popularisation lectures (that were not included in the original plan), which will clearly emphasize that difference and help in understanding how to effectively design, develop, and deliver high-quality instruction online.

No popularization lectures to the general public were held to date (they are planned to happen at Q3 and Q4 of 2021), but many promotional steps (including, but not limited to the presentations organized for the faculty professors at the university of Belgrade and the examples of good practice by the project team members, one of which has received a prestigious award) have been taken.

The rulebook on continual professional development (CPD) of teaching staff is entering the creation phase in January 2021 at the coordinator institution, while that phase is coming to a close in Novi Sad, as this rulebook has been integrated into the functioning rulebook of the afore-mentioned Centre of methodology of teaching natural sciences, mathematics and computer sciences. Other PC HEIs will follow soon.

Near the end of the project life, the strategy of improving the quality of teaching and learning based on the information acquired through questionnaires catered to both students and professors who have familiarised themselves with modern methodologies will be created. This activity will have a long-term impact on the process of raising awareness of teachers and students about the necessity of strengthening teaching competences in higher education.

TeComp project has, in cooperation with Educational forum from Belgrade, created a questionnaire about the students' opinions on the quality of online teaching and learning. Over 500 students, all-across Serbian universities, participated and the results will be announced soon.



Once the new modernised courses are implemented, a uniform questionnaire will be developed. This questionnaire will be designed to ensure that we receive objective evaluation of teaching staff, new courses and teaching and learning in general. This questionnaire is to be used in all PC institutions involved in the project.

WP7 Management

Two CMT meetings were organised between the kick-off meeting and now. The first one was held in Granada in November 2019, with a small latency due to the inability to find a date suitable to all members of the coordination team. The second was organised online in June 2020 and the meeting report can be found on our website.

Three local committee team (LCT) meetings have been organised. One took place in Belgrade in July 2019, one in Novi Sad in January 2020 and the last one was held online on Thursday, December 24th, 2020.

The project administration platform (PAP) has been successfully created and is now regularly updated. More info on this topic can be found above.

Interim report has been submitted on time, before May 15th 2020, and with this document we are answering EACEA recommendations.

Inform us of the state of play of the equipment purchase and installation in the Albanian universities.

The predicted equipment, in Albanian universities, was purchased during May 2020, and it has already been installed and is widely in use in teaching at UGJ and UNIKO, now.

Give access to the Agency to the project management platform so to assess better the progress of the project.

The project administration platform is now accessible to the Agency under the username: **EACEA** and password: **TeComp!2021**.

The consortium should define a strategy and selection criteria for workshops and trainings in order to reach the appropriate target group.

In the project application we expected a wide target group (1500 teachers and 15000 students) and we have defined the strategy and the selection criteria to reach the appropriate individuals, who can capitalise the impact and sustainability of the project. The criteria that every teacher participating in the webinars corresponding to the preparation of training material, as well as those who are to train young assistants and assistant professors is that they themselves are proficient/experts in pedagogy, psychology



and/or methodology of teaching and learning in the field of natural sciences, mathematics and computer sciences or are highly aware of the necessity of straightening teaching competences and modernisation of education. For these activities, only experienced associate and full professors have been chosen. All the trainees are chosen based on age and experience (assistants and younger professors with less experience who did not attend any pedagogical and methodological courses). Attendance of the trainings will not be obligatory, at least not currently, and it will therefore be necessary to conduct a broad campaign to raise awareness among the teaching staff of the necessity of continued efforts to improve its teaching capabilities and on the benefits of it. The way we wanted to motivate teachers and teaching assistants to actively participate in the training program was to give them an opportunity to perform a part of their professional training attain higher levels of experience in the certain EU partner universities. In such circumstances, we will try to motivate them by making grading criteria for the appointment to higher teaching positions in Serbia, which will take the quality of their teaching into account. Up until now, the only criteria which mattered during these appointments in Serbia was science, but we suggest that young teachers and assistants must also finish some courses in pedagogy, psychology and methodology. This topic was brought up during the last LCT meeting held on Thursday, the 24th of December and partners managed to brainstorm many ideas on how to introduce these criteria.

To ensure that the target groups are available even after the completion of the project, we will initiate the preparation and adoption of two important documents. The first of them is the Rulebook on continuing professional development of teaching staff. After its adoption, our program will grow into a regular program of continuing professional development of teaching staff that will continue even after the completion of the project. The other one is the Strategy for the support and on-going improvement of the quality of T&L.

Upload the project outputs and maintain updated the website.

In order to ensure the dissemination of information, the project website was created, maintained and regularly updated. Sadly, the COVID-19 pandemic left us without any tech support for a long time (a person charged with this duty came down with the virus and resigned from his position) and even though we are now back and working at full force, the newly redesigned version of the website still has a few holes to be patched. Almost all outputs of the project will be uploaded to the website before the Agency revision.

The comments of the Agency letter on the financial statement.

We have noted that you have reported expenditure linked to the organisation/catering of meetings and events. Please note that in order to prevent double funding by the grant, catering and hospitality costs (e.g. during project events) for participants receiving Costs of Stay cannot be covered by subcontracting. Under no circumstances should these costs be charged to the project twice.

WORKING PLAN

In the coming period, work on the implementation of the remaining activities within the work package WP2 will await us.

WP2 – Upgrading educational infrastructure at the PC HEIs,

The beginning of the work on the realisation of activities within the work packages

WP3 – Professional development of teaching staff

WP4 – The formation of online learning environment,

are in front of us, too.

Within the work package WP2, after the equipment purchasing and webinars given by colleagues from Granada, Gent, Oviedo i Banska Bystrica, we must continue the activities on

2.2. Preparing material for PPM training courses i

2.4. Preparing guidelines for the technological enhancement of teaching and learning.

These two activities are closely related to the implementation of appropriate activities within WP3 and WP4. Namely, the activity 2.2 consists of the basis for

3.2. PPM training of teaching staff,

while 2.4 is the basis for the activity

3.3. Training of teaching staff for using new educational technologies,

4.1. The integration of online technologies into traditional courses,

4.2. Developing systems for electronic testing i

4.3. Forming online labs.

Hence, the implementation of all these activities should be planned together.

Activities 2.2 and 3.2:

It is necessary that everyone who wants to participate in the implementation of these activities proposes topics that would be covered in the pedagogical-psychological-methodological (PPM) training courses, as well as topics that would be covered in the teaching material for these courses, which will be prepared in electronic form and printed in the form of a manual.

Our opinion is that the training material does not have to include absolutely all the topics that would be covered in the training courses.

Activities 2.4 and 3.3:

Within the activity **2.4** guidelines for wider integration ICT in teaching and learning are needed to be prepared. It is planned that this material be used within the framework of the implementation of activities **4.1-4.3**, and a part of the material would be used as teaching material for the training courses related to use of new technologies in teaching and learning, which will be implemented within the framework of activity 3.3. This material will also be prepared in electronic form and printed in the form of a user manual.

Therefore, it is necessary that everyone who wants to participate in the implementation of these activities proposes topics that would be covered in the training courses for the use of modern technologies in T&L, as well as the topics that will be included in the guidelines for the wider integration of ICT in higher education, within the activities **4.1-4.3**.

In accordance with the topics proposed within the activities 2.2, 2.4, 3.2 i 3.3, the multidisciplinary teams for the preparation of training materials and guidelines will be formed.

Activities 4.1, 4.2 and 4.3:

Within the activity **4.1**, it is planned to launch pilot projects for the integration of online technologies into a numerous of traditional courses. The role of these pilot projects is to demonstrate the benefits of usage of online technologies in teaching and learning and to encourage a wider circle of teachers and associates to use these technologies themselves. In order to emphasize the great diversity of models for the use of modern technologies in teaching and learning, it is necessary to offer several different scenarios for the integration of online technologies into courses.

It is planned to form a team that will analyze the specific needs of courses and teachers and propose suitable online learning platforms that will be used as a basis for designing new technologically improved courses.

It is necessary that everyone who wants to participate in the implementation of this activity submits the names of courses which would be innovated in this way.

Within the activity **4.2**, the development of a system for electronic testing, i.e., the adaptation of some existing systems to the specific needs of our courses is planned. A team of experts, in cooperation with teachers who are interested in the introduction of electronic testing systems, will propose appropriate methodological and software solutions, and oversee the creation of these systems.

Here is necessary, too, for everyone who wants to participate in the implementation of this activity to submit the names of the courses within which he intends to introduce electronic testing.

As a part of activity **4.3**, it is planned to launch pilot projects for the integration of online technologies in some laboratories. A team composed of IT experts and teachers who intend to integrate online technologies into their laboratories will analyze the specific needs and capabilities of these laboratories and propose appropriate methodological, hardware and software solutions and monitor the implementation of pilot projects.



It is necessary that everyone who wants to integrate online technologies in the laboratory submits the name of that laboratory and the courses for which laboratory exercises would be realized in that laboratory.

Our partner P11 (University of Ostrava, Czech Republic) has removed costs representing double funding from the declared subcontracting costs.

We have noticed that some VAT amounts may have been declared to the project. In these cases, please note that each beneficiary concerned will need to provide a certification by the relevant tax authority that their institution is not able to recover these VAT amounts.

We asked our partner P11 to provide a certificate issued by the relevant tax authority that their institution is not able to recover the VAT amounts declared under subcontracting costs. If they are unable to provide such a certificate, the declared VAT will be removed from the subcontracting costs and will be treated as co-financing.

We have also noted that you are declaring costs for stationary – office supplies. Please note that these costs must be covered by co-financing, they cannot be covered by Subcontracting.

Partner P11 has already removed the costs for office supplies from the declared subcontracting costs.

We are thankful to you for providing so much support and encouragement to us.