



Strengthening Teaching Competences  
in Higher Education  
in Natural and Mathematical Sciences

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



# What was done within the WP2? Did we achieve main goals?

## WP 2 - Upgrading educational infrastructure at the PC HEIs

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# WP2 – Upgrading educational infrastructure at the PC HEIs

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Lead Organisation – P4 University of Kragujevac

## Tasks

- 2.1 Forming technology-enhanced learning spaces
- 2.2 Preparing material for PPM training courses
- 2.3 Creating material for providing language support for teaching staff
- 2.4 Preparing guidelines for the technological enhancement of teaching and learning

Period: 15-06-2019 (?) - 14-07-2020 (?)

## 2.1 Forming technology-enhanced learning spaces

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### Chronology of activities

- ✓ The **provisory equipment specification** given in the project application as the need of the PC universities, **was revised** by two constituted work groups (Serbian and Albanian). A work group for each partner country was consisted of IT experts from that country. The work of these groups started simultaneously with comparative analysis and identification of needs in WP1.
- ✓ The **final decision about the purchase of equipment was made at the ~~second~~ LCT meeting in Belgrade (July 2019).**
- ✓ Separate **tender procedures** for the Serbian (during 2019) and Albanian partner (during 2020) institutions **have been carried out.**

## 2.1 Forming technology-enhanced learning spaces

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### Chronology of activities

- ✓ Purchased equipment was installed and used extensively in teaching and learning process. This equipment formed technology-enhanced learning spaces at all universities, which was of great importance during pandemic crisis.

## 2.1 Forming technology-enhanced learning spaces

- Purchued VCRs were useful for exchanging experiences in the real time, for organising on-line meetings, collaborations and workshops.



## 2.1 Forming technology-enhanced learning spaces

- ✓ Equipment for modernisation of classrooms and laboratories at the PC HEIs was used by teachers in performing remote labs, recording video lectures, conducting mixed live and online lectures for students who participated from their homes.



# 2.1 Forming technology-enhanced learning spaces

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- Technology-enhanced learning spaces enable the use of innovative teaching and learning methodologies during and after the project life.



## 2.1 Task - To Do List

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- What is the period of realization for WP2?
- When was the final decision for selection of equipment to be purchased?

Partner university	Reports	Gallery
University of Niš	Final draft	✓
University of Beograd	Final draft	✓
University of Novi Sad	Final draft	✓
University of Kragujevac	Final draft	✓
Eqrem Çabej University Gjirokastrë and Fan S. Noli University Korçë	Final draft	Fotos for website missing



## WP2 – Resume for tasks 2.1

Title	Universities equipped with technology-enhanced learning spaces	
<b>Type of Deliverable/ Results/ Outcomes</b>	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input checked="" type="checkbox"/> Service/Product
<b>Achieved goals</b>	<p>For Serbian and Albanian universities appropriate equipment for educational purposes was purchased and installed. This resulted with upgraded technical infrastructure and laboratory equipment, and enabled technology-enhanced learning spaces.</p>	
<b>Conclusion</b>	<p>Aims are completely achieved.</p>	

## 2.2 Preparing material for PPM training courses

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### **Hronology of activities**

- Thinking and collecting ideas and drafts for training and training materials starts in the first year of the project initiated with findings in reports of WP1 and experiences collected during visits of partners in EU in year 2019.
- Unfortunately, because of COVID pandemic, all planed visits to the partners from EU were postponed. Instead of that, and after the eligibility period of the project extended by 12 months, at the end of year 2020, partners from UNIOVI, UMB and UGR conducted webinars in December 2020. Also, during the spring 2021 UGENT conducted online 12-week (45 hours) course the professional Development course “Educational Interaction and Communication in Higher Education”.

## 2.2 Preparing material for PPM training courses

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### **Hronology of activities**

- In spring of 2021, partners from Serbia and Albania, motivated by the perceived needs of teachers and students in HE in Serbia and Albania, and by the experiences collected during visits of partners in EU and participating in their webinars, planed several training programs within the WP3 and training materials within the WP2.
- At online CMT held on 22nd March Editorial board for training material (task 2.2) was formed. Zorana Lužanin (UNS) was elected for the presedent, and other members were Miroslav Ćirić (UNI), Andrijana Zekić (UB), Siniša Đurašević (UB), Slađana Dimitrijević (UNIKG).
- The Editorial board is 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.

## 2.2 Preparing material for PPM training courses

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### Chronology of activities

- Draft versions of programs and learning material, each of them in Serbian and in English, were collected till LCM in Kragujevac in June 2021.
- At LCM in Kragujevac in June 2021 several programs are presented and (having in mind COVID) optional plan for their realization was adopted. Also, Editorial board defined reviewing process and plan dynamic for it.
- During the summer 2021 reviewing process was ended, materials were organized in two booklets and proofreading (in Serbian) were finished. Final versions of materials were accepted by Editorial board on online meeting held on 25th August. One booklet is devoted to digital competences and the other to didactic and pedagogical competences.
- At the end of year 2021 the materials were published in Serbian and English.

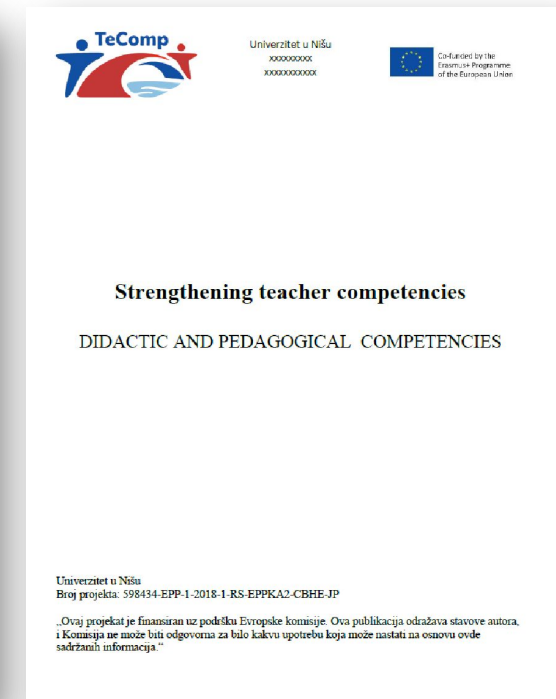
## 2.2 Preparing material for PPM training courses

### ✓ Volume for didactic and pedagogical competences

- 9 themes
- 9 authors from 2 universities

Miroslav Čirić: <b>Modernization of teaching and learning in the European Higher Education Area</b> .....	5
Zorana Lužanin, Andreja Tepavčević: <b>Preparation of teaching materials - Example of a textbook</b> .....	31
Andreja Tepavčević, Zorana Lužanin: <b>Assesment of student knowledge - How to evaluate math students</b> .....	49
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Jelena Petrović: <b>Constructivist approach to teaching and learning in higher education</b> .....	107
Aleksandra Anđelković: <b>Effective teaching through the beliefs and reflexivity of teacher</b> .....	127
Dragana Jovanović: <b>Teaching methods in university settings - How to teach students how to learn</b> .....	143
Jelisaveta Todorović: <b>Difficulties and challenges of inclusion in higher education</b> .....	169

193 pages

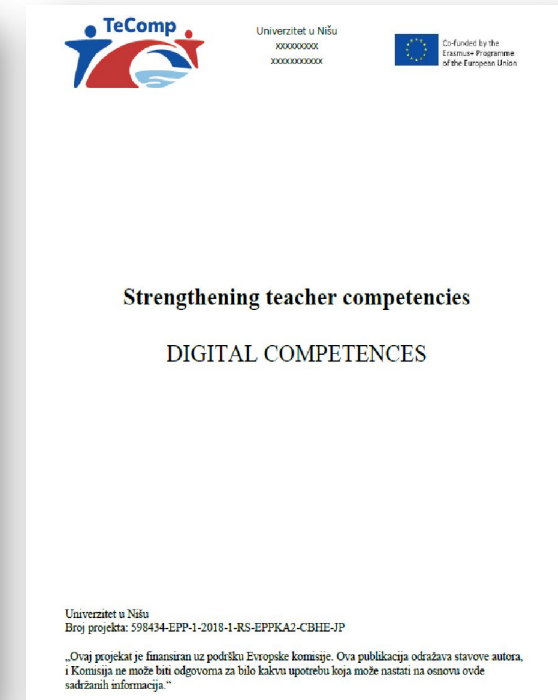


## 2.2 Preparing material for PPM training courses

### ✓ Volume for digital competences

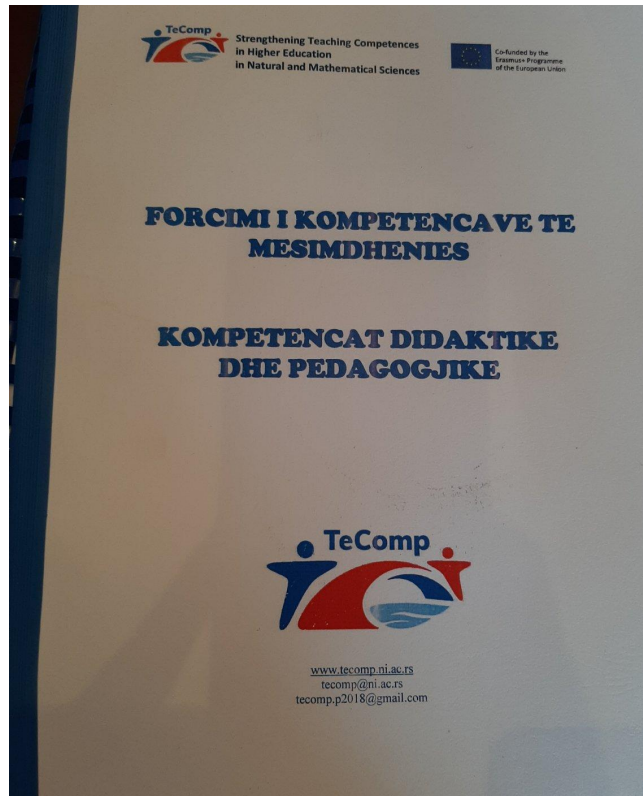
- 7 themes
- 10 authors from 4 universities
- 146 pages

Jelena Ignjatović: <b>Creating interactive teaching materials</b> .....	5
Sladana Dimitrijević, Ana Kaplarević Mališić: <b>Blended learning with special reference to the Flipped classroom</b> .....	35
Nebojša Jasnić, Siniša Đurašević: <b>Modernization of teaching and learning biology</b> .....	69
Tatjana Anđelković, Ivana Kostić: <b>Remote access to analytical instruments in chemistry higher education – From idea to realization</b> .....	81
Goran Radojev: <b>Visualization problems using GeoGebra and Wolfram Mathematica</b> .....	95
Đurđica Takači: <b>Mathematics contents in dynamic geometry environment</b> .....	111
Sana Stojanović Đurđević: <b>Theorem prover Isabelle in the teaching of natural and mathematical sciences</b> .....	133



## 2.2 Preparing material for PPM training courses

- ✓ During the spring 2022 partners from Albania translated both volumes in Albanian.



- ✓ Volume for didactic and pedagogical competences
  - 7 staff members from Eqrem Çabej University Gjirokastër were involved in translating the materials (Irma Gjolleshi, Dhori Terpo, Antuela Sinani, Loreta Mamani, Mimoza Çarka, Romeo Mano, Isidor Kokalari)
- ✓ Volume for digital competences
  - ?? staff members from **Fan S. Noli University Korce** were involved in translating the materials (???)

## 2.2 Task - To Do List

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- What is the end date for realization of task 2.2?
- Were programs and learning materials approved at some CMT meeting? When?
- Should the electronic versions of printed materials be posted on TeComp site?
- Who from Fan S. Noli University Korce were involved in translating the materials?



## WP2 – Resume for tasks 2.2

Title	Universities equipped with technology-enhanced learning spaces	
<b>Type of Deliverable/ Results/ Outcomes</b>	<input checked="" type="checkbox"/> Teaching material <input checked="" type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
<b>Achieved goals</b>	Printed and electronic materials for psychological, pedagogical and methodological (PPM) training courses were prepared (in Serbian, English and Albanian). They were used for the trainings organized within WP3.	
<b>Conclusion</b>	Aims are completely achieved.	

## 2.3 Creating material for providing language support for teaching staff

- ✓ **During the 2021** electronic material for providing English language support to professional development of teaching staff were prepared, published and later in 2022 used within the task 3.4.
- 6 themes
  - 3 authors from University of Niš
  - 60 pages

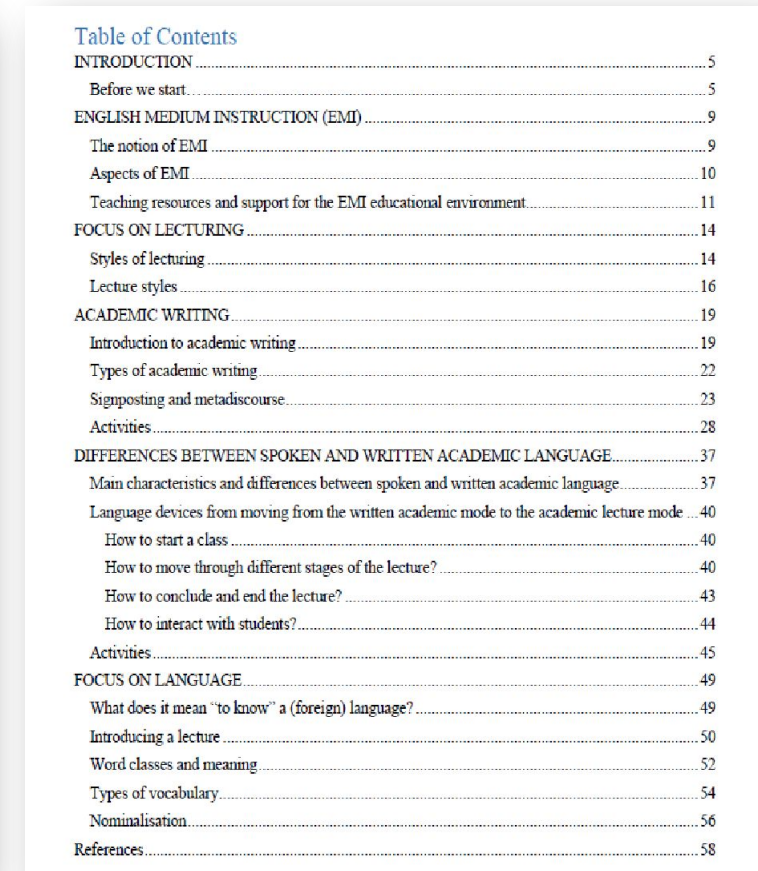
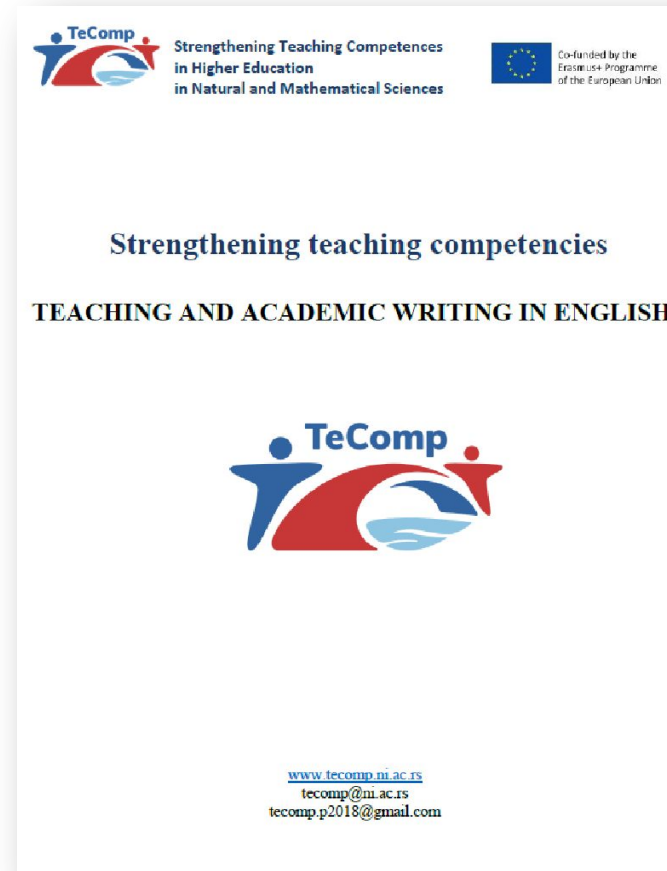


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## 2.3 Task - To Do List

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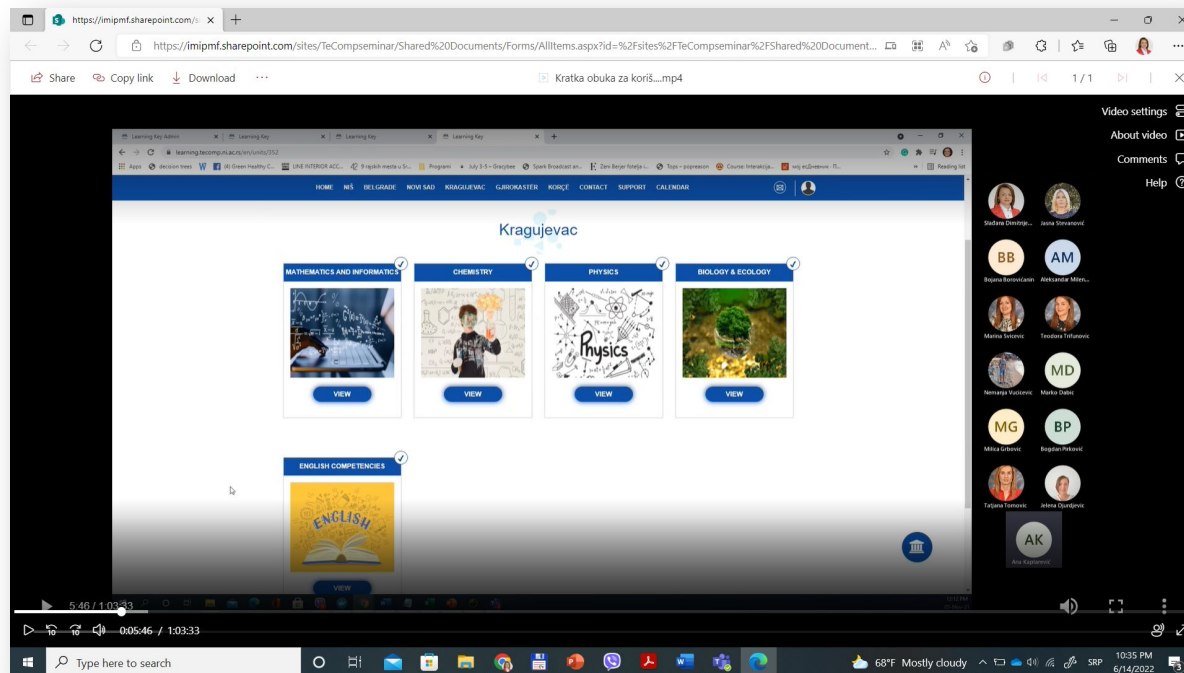
- What are the start and end date for realization of task 2.3?
- Should the electronic version of printed materials (or some part of it) be posted on TeComp site?

## WP2 – Resume for tasks 2.3

<b>Title</b>	<b>Creating material for providing language support for teaching staff</b>	
<b>Type of Deliverable/ Results/ Outcomes</b>	<input checked="" type="checkbox"/> Teaching material <input checked="" type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
<b>Achieved goals</b>	Printed and electronic material for providing language support for teaching staff was prepared specially taking in to account the specific needs of teaching and academic writing in English in the field of natural and mathematical sciences. They were used for the trainings organized within WP3, activity 3.4.	
<b>Conclusion</b>	Aims are completely achieved.	

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

- ✓ Guidelines and instructions for wider integration of ICT in teaching and learning were already given in the volum for digital teacher competences in task 2.2.
- ✓ Additionally, for LearningKey platform (developed in activities 4.1 and 4.2) guidelines (in Serbian and in English) and video instructions (in Serbian) were prepared (several versions during the development of platform).



## 2.4 Task - To Do List

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- What are the start and the end date for realization of task 2.4?
- Should the electronic version be posted on TeComp site?
- Were program and learning material approved at some CMT meeting? When?

## WP2 – Resume for tasks 2.4

<b>Title</b>	<b>Preparing guidelines for the technological enhancement of teaching and learning</b>	
<b>Type of Deliverable/ Results/ Outcomes</b>	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
<b>Achieved goals</b>	<p>Electronic and printed guidelines and instructions for using LearningKey platform, developed in WP4, was prepared, as well as video guidelines. Also, the guidelines and instructions for wider integration of ICT in teaching and learning were given in the booklet for digital teacher competences in WP 2.</p>	
<b>Conclusion</b>	<p>Aims are completely achieved.</p>	

# WP2 – Form of the Report?

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- Short introduction with specification of tasks
- Task 2.1
  - Short introduction about activity (analog description to one in application of the Project)
  - Reports of P1, P2, P3, P4, and joint reports for P5 and P6
  - Resume table
- Task 2.2
  - Short introduction about activity (analog description to one in application of the Project)
  - Chronology of conducted activities
  - Resume table



# WP2 – Form of the Report?

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## □ Task 2.3

- Short introduction about activity (analog description to one in application of the Project)
- Chronology of conducted activities
- Resume table

## □ Task 2.4

- Short introduction about activity (analog description to one in application of the Project)
- Chronology of conducted activities
- Resume table

## □ Conclusion

- Work packet 2 is successfully finished and tasks are fulfilled.

## WP2 – Conclusion remarks

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- Some data, needed for the Report, are missing.  
Please send them till the end of September.  
[sladjanadimitrijevic@gmail.com](mailto:sladjanadimitrijevic@gmail.com)  
[sladjana.dimitrijevic@pmf.kg.ac.rs](mailto:sladjana.dimitrijevic@pmf.kg.ac.rs)
- Do you agree with the given information, conclusions, and proposed form of the report?
- Is there something else that should be add or mentioned?
- Comments or suggestions



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## P4 – University of Kragujevac

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Thank you all for good cooperation  
during project activities!