INNOVATIVE MODEL OF LEARNING STEM IN SECONDARY SCHOOLS
2022-1-TR01-KA220-SCH-000087583
Meeting Minutes for the 3rd Learn STEM TPM

Host : IEK Kavalas (Greece)
Date : 31 January 2024-02 February 2024
Venue : Kavala Library
Participants: 23 Participants

Institution	**Its representatives**
Necmettin Erbakan University	Mustafa Kocaoğlu Şemseddin Gündüz Yakup Yılmaz
Universität Paderborn (Germany)	Helene Lindenthal Niclas Grüttner
Ingenious Knowledge GmbH (Germany)	Tim Kreuzberg
EURO-NET (Italy)	Martina Sabia Guido D'Apuzzo
Colegiul Tehnic "Haralamb Vasiliu" (Romania)	Gabriel Signeanu Carp Monica Mihaela Saiz Ana
IEK Kavalas (Greece)	Kalliopi Ntolou
Ahi Evran Anadolu Lisesi (Türkiye)	Ali Erdem Nuray Burçak Fatih Yavuz Hasan Avan Şakir Çınar
Yusuf Demir Bilim ve Sanat Merkezi (Türkiye)	Musa Sargın Hayriye Torunoğlu Ramazan İlhan Siyami Tufan Mehmet Aydın Seyit Karaburçak Demet Şener Çanlı Yunus Geçer

Minutes of the meeting:

1. The meeting started with the greeting and welcoming speech of the host partner, Popi Ntolou from IEK Kavalas, Greece.

2. As the representative of the coordinating institution, NEU, Prof Dr. Mustafa Kocaoğlu described the current status of the project Learn STEM and summarized what had been done so far.

3. We shortly looked at the project teams' 'Good Practice Examples of Innovative STEM Learning'.
   https://drive.google.com/drive/folders/1FQB297LHt6a-2okJA7VKmM4J7ZS43_XR

   https://drive.google.com/drive/folders/11oA4dZWuY5LtIykX58vRbqJWLJVR3zAt

   This collection provides some examples of good practices for teaching Science, Technology, Engineering and Mathematics (STEM) through innovative pedagogical approaches. **Yusuf Demir SAC is responsible for publishing these practices as an e-book or printable by March 1, 2024.**

4. Every school partner presented their own topic-related materials and learning units, and all partners provided feedback for the WP2-related materials below.

   * Video about the experiment real part and video scribe part,
   * Presentation with the subject-related backgrounds
   * Interactive H5P- tasks
   * Additional Learning Materials and YouTube videos

Topic 1 Recycling	Colegiul Tehnic "Haralamb Vasiliu" (Romania)
Topic 2 Pollution	IEK Kavalas (Greece)
Topic 3 Nature	Yusuf Demir Bilim ve Sanat Merkezi (Türkiye)
Topic 4 Climate	Ahi Evran Anadolu Lisesi (Türkiye)

5. Prof. Dr. Marc Beutner, on behalf of the leading Output 1 (WP2) team, had already informed all the participants about the Learn STEM Pedagogical Model in Paderborn meeting. According to his demonstration, three schools had done their learning units except Greek school. **IEK Kavalas will have done by 15 March 2024.**

   Paderborn Team sent feedback regarding each partner school's work. Please make necessary changes based on Helene's mail of feedback (dated February 12, 2024). **After you are done with changes, please put the corrected materials into the drive folder by March 15, 2024.**

6. Tim Kreuzberg, on behalf of Ingenious Knowledge, presented about the web portal and sorted out the open questions.

7. **WP 3/Output 2 - LearnSTEM teacher training programme was discussed.** The project coordinator NEU leading this workpackage shared a brief description of the 2nd output requirements. The 2nd output involved a Learn STEM Teacher Training Programme. They shared the draft LOM, Learning Outcome Matrix, to conduct the relevant activities.

   O2 - A1 Identify concrete training needs and opportunities for STEM Teachers

   O2 - A2 Define training curriculum

- Learn STEM wants to define the needs of STEM teachers and to design a Teachers' Training Programme that will help to meet those needs.Therefore, Learn STEM conducts the surveys for teachers based on the scientific research.

- Learn STEM Surveys had already been done by NEU in both Turkish and English.

For Turkish form: https://docs.google.com/forms/d/e/1FAIpQLSdIAUTRog6mU-5gKihkVTaRyLHEE1_rTsgD6rKg8t3PGI7XBQ/viewform

For English form: https://forms.gle/bmBa45r3f9Kjofcz9

The English form questions are also attached to this meeting minutes.

- **Each partner school is expected to translate these forms into their own language and share the form in their language with the teachers and headmasters in their contexts to explore their opinions on the proposed training model and what their training needs are. Each partner will collect data carrying out these forms and report the results to NEU, the leading team in English by June 1, 2024.**

- The final report on training needs and opportunities for STEM Teachers will be prepared by NEU and they will send it back to IK and Paderborn University.

- Teacher Training Program/Curriculum will be developed by NEU.

- Training materials related to the curricula will be developed by NEU.

- Assessment tools related to the LOs and training curricula will be developed by NEU.

  Necmettin Erbakan University will prepare the "Lesson Plan Template" by 15 March and send this example to the schools. All four schools, according to their topic, will complete the lesson plans and send it back to NEU. The coordinator will collect and revise the draft work and finalize the curriculum and send it to I.K.

Lesson plans for learning sources/units will be written by the 4 schools and sent to NEU by the end of April, 2024.

NEU will provide feedback on the created lesson plans by the mid of May.

Schools will revise and finalise lesson plans by the 4th meeting in Italy.

8. The LEARN STEM online learning environment will be developed in English and Partners will translate in their national language synthesis/presentations for dissemination and evaluation purposes. The online course addressed to teachers will be developed as a MOOC in order to allow a large number of users and to facilitate its transferability and further exploitation.

LEARN STEM online learning environment implemented

1 MOOC addressed to teacher training

9. Output 3.LEARN STEM online learning environment demo was almost implemented by IK.

The Online Environment" MOOC is almost ready to use. I.K. prepared the draft and showed us the demo of the online platform to the partners. On the platform there will be four topics, which were studied by the schools. Most participants agreed on an open learning environment without the requirement of opening an account and signing up. The learning platform prototype was shown by IK and liked every participants.Partners agreed upon the learning environment architecture according to the needs and learning objectives identified and based on the training contents developed. The Pedagogical Model, the learning programme, the inquiry learning environment and the implementation guidelines produced will be integrated in the online environment. In order to facilitate further exploitation of the learning environment, Partners will provide practical guidelines, explaining its functionalities and the different components.Testing of technical functionalities will be done in İtaly.This phase will include specific technical tests to make sure the system is free of bugs or any other programming error. Partners will elaborate on a commonly shared testing methodology and set of instruments and tools for this phase. This will facilitate comparability between the participant countries and will allow the consolidation of the online learning environment according to common needs and, at the same time, allow customization, if necessary. The methodology will refer to objectives, strategies, stakeholders to be involved, methods, instruments and tools to be used and reporting procedures and templates.The online course addressed to teachers will be developed as a MOOC in order to allow large number of users and to facilitate its transferability and further exploitation.

10.The Conference "Learn STEM: Innovative pedagogy for STEM education" conference will be in Kırşehir.

School teachers, headmasters and researchers are most welcome to join the discussion. During the three hours, experts from Learn STEM, scientific research as well as school practice will present and discuss how to improve school education in Science, Technology, Engineering and Mathematics (STEM).Final dissemination Conference in Turkey Kırşehir will involve 145 stakeholders.

11. Official documents

Documents supporting the Justification of costs and expenses for TPM3 were handled.

https://drive.google.com/open?id=1EsCUg6Df30QwdHXaNh0mlo1ClpC8y0Dt&usp=drive_fs

The link for travel documents in the drive folder is
https://drive.google.com/open?id=1Nx9oouoc1fnm8BLWQgDab3F-NJAuukVr&usp=drive_fs

12. Presentations

All presentations of TPM3 will be added into folder
https://drive.google.com/open?id=1O0GzO5I7dsjeYrMameKB4y-3UQH_uY5N&usp=drive_fs

13.Project Meetings

The Next Meetings Dates were also suggested and agreed by all the partners.

Italy:25-27 June 2024 with 26th as working day (regarding the testing of Mooc and discussion of teacher training program)

Romania:4-6 September 2024 (regarding the discussion of dissemination conference)

Türkiye: Kırşehir 2-4 December 2024

14. Evaluation form

The 3rd TPM organized by IEK in Kavala, Greece will be evaluated by February 15, 2024 through the link.

https://docs.google.com/forms/d/e/1FAIpQLSdlcD6dTbzWy1r4KYrAOsKzQSKOx7rwy3zYvc5TcK5RJLrrWw/viewform

The results of the evaluation form will be reported by IEK to NEU By March 1, 2024.

15. Pictures

Pictures will be uploaded into the drive

https://drive.google.com/open?id=1dIjfHbVksS4wi1SzxtaLMyo-gNfVWflz&usp=drive_fs

16.Certitificates were uploaded into the drive

The closure of the meeting was done by distributing the certificates. Popi scanned and stored all certificates in the drive folder.

https://drive.google.com/open?id=1xzbndgRroYI7APlIxR9ODxu_nYbQuR1f&usp=drive_fs

17.Dissemination and Exploitation

EURO-NET has created a file to be filled by your organisations to show what your organisation did in the field of dissemination. Each partenr will download the blank file and complete it with its own dissemination activities and put it into drive folder of dissemination.

https://docs.google.com/spreadsheets/d/18ZDjFgqJUUaldwSCWLovPkrSIw7qOTcq/edit?pli=1#gid=197746469

EURO-NET has also created the dissemination plan of the project. Please stick to the plan
https://drive.google.com/open?id=1dbmBbxJKb9FHHArC0ZspwLOHIAMxXqSD&usp=drive_fs

Some further suggestions for the website were shared. Euronet, responsible for the website content, will add the news and photos regarding the project activities and meetings. All partners were asked to avoid copyright infringement of the materials used for the project outputs. It was recommended to use OER (Open educational resources). All partners will also publish project-related posts/online articles/newsletters for further dissemination in the following weeks.

18. The second project video

The project second video will be prepared by NEU by 1st April 2024.

19. Translation to Local language

All the educational materials that the partner organizations prepared will be translated into to the local language by 1st June 2024

APPENDIX 1

STEM: **Needs Assessment for Teachers**

We need your valuable opinions within the scope of the Erasmus+ Project of our teachers for STEM in the form delivered to you, our valuable teachers. The information you contribute will not be shared with third parties. Thank you in advance for your contribution.
Project Coordinator: _____
Project Researchers: _____

Gender:
Female
Male

Your field of study:

Years of teaching experience:

Type of school you work in:

1. I know what the letters in the STEM acronym stand for.

Yes
Partially
No

2. Science in STEM is defined as "the endeavor to understand and describe the natural world".

Yes
Partially
No

3. Technology in STEM is defined as "the study, products and process of the man-made world".

Yes
Partially
No

4. Engineering in STEM is defined as "creating the man-made world-products and processes that have never existed before"

Yes
Partially
No

5. Math in STEM is defined as "the study of patterns and relationships between quantities, numbers and shapes".

Yes
Partially
No

6. I have knowledge about educational Technologies.

Yes
Partially
No

7. I have basic knowledge about fields related to my field.

Yes
Partially
No

8. I have design (engineering) knowledge in the concretization of issues related to my field.

Yes
Partially
No

9. I have knowledge about the Problem Based Learning method used in STEM.

Yes
Partially
No

10. I know about the inquiry learning method used in STEM.

Yes
Partially
No

11. I know about the design-based learning method used in STEM.

Yes
Partially
No

12. I can establish interdisciplinary relationships.

Yes
Partially
No

13. I can collaborate across disciplines.

Yes
Partially
No

14. I know the process of problem-based learning.

Yes
Partially
No

15. I can apply the problem-based learning method in the classroom.

Yes
Partially
No

16. I know the process of inquiry learning.

Yes
Partially
No

17. I can apply the inquiry learning method in the classroom.

Yes
Partially
No

18. I know the design-based learning process.

Yes
Partially
No

19. I can apply design-based learning in the classroom.

Yes
Partially
No

20. I know coding.

Yes
Partially
No

21. I can prepare instructional content associated with coding.

Yes
Partially
No

22. I can implement instructional content associated with coding.

Yes
Partially
No

23. I can prepare a lesson plan suitable for STEM-related to my field.

Yes
Partially
No

24. I can implement a STEM-appropriate lesson plan related to my field.

Yes
Partially
No

25. I can prepare STEM-appropriate activities related to my field.

Yes
Partially
No

26. I can apply STEM-appropriate activities related to my field.

Yes
Partially
No

27. I know the types of outcome-oriented assessment and evaluation.

Yes
Partially
No

28. I can apply the types of outcome-oriented assessment and evaluation.

Yes
Partially
No

29. I know the types of process-oriented measurement and evaluation.

Yes
Partially
No

30. I can apply the types of process-oriented measurement and evaluation.

Yes
Partially
No

“LearnSTEM Innovative Model of learning STEM in secondary schools” *2022-1-TR01-KA220SCH-000087583*

3 TPM / Evaluation form

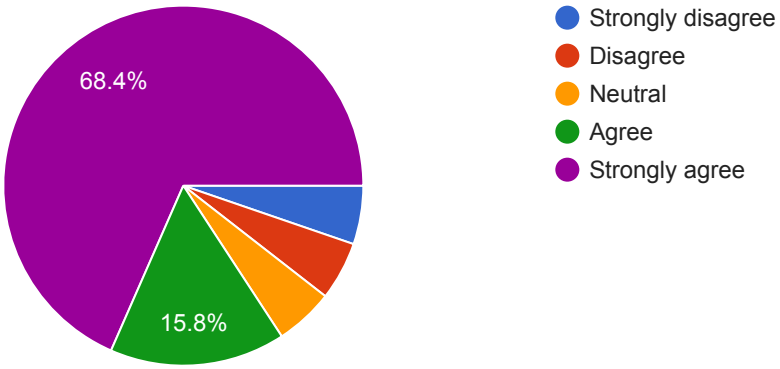
19 responses

Publish analytics

1. 3rd TPM reached my expectations.

Copy

19 responses



2. 3rd TPM' s objectives were clear to me.

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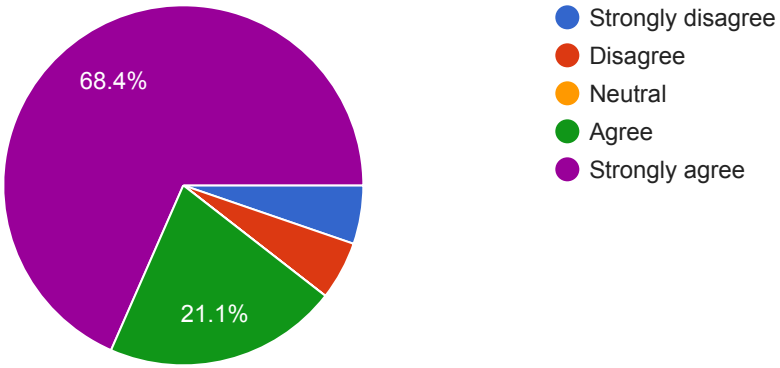
19 responses



3. The difficulty level of 3rd TPM was appropriate.

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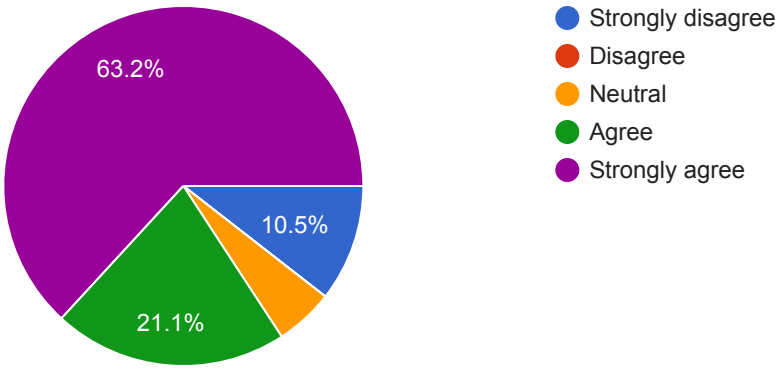
19 responses



4. Contents of 3rd TPM were presented in an intresting way.

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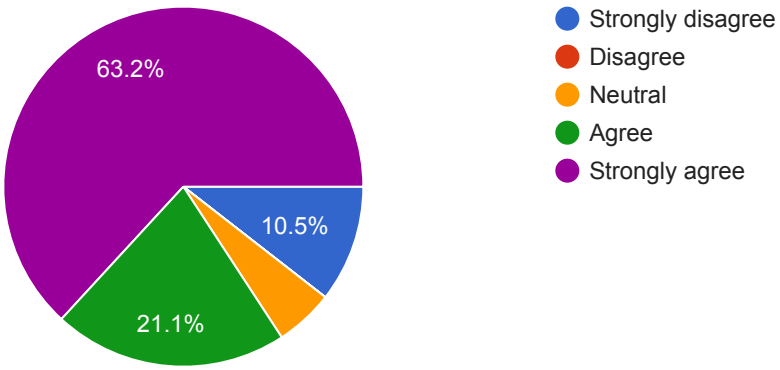
19 responses



5. 3rd TPM was interesting.

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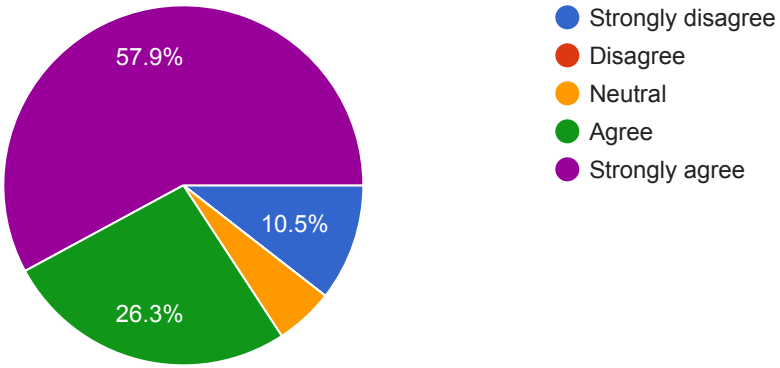
19 responses



6. The coordination was helpful.

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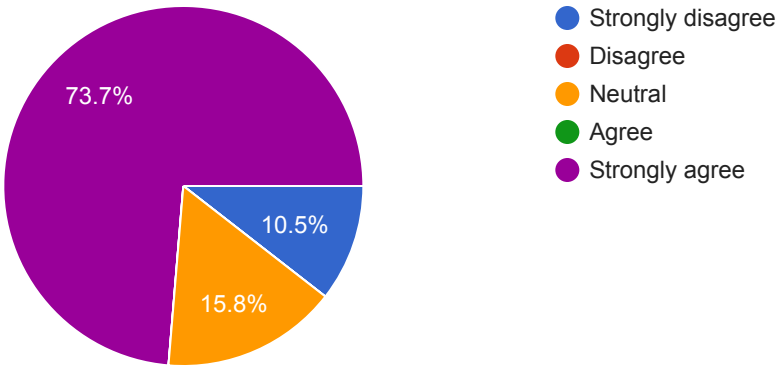
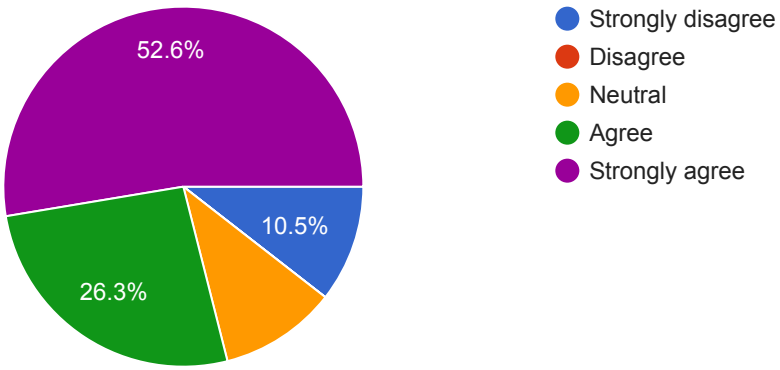
19 responses



7. After 3rd TPM, I have a clear picture for the projects' next steps.

Copy

19 responses



8. I know what my tasks for the upcoming period are.

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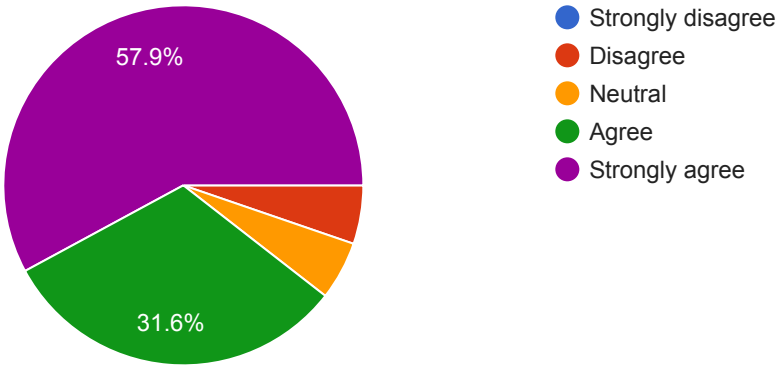
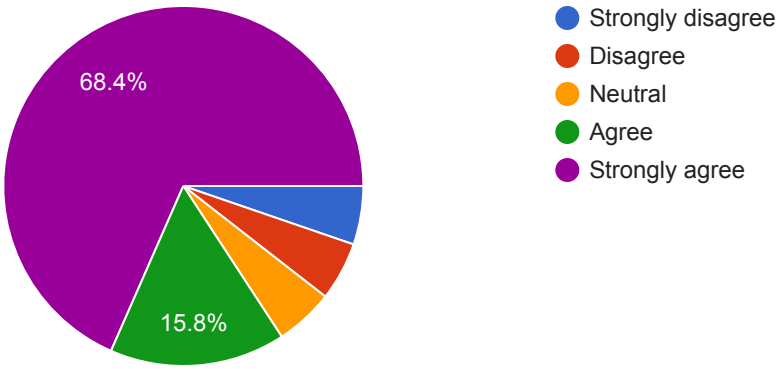
19 responses



9. Overall, I am happy with the conference results.

Copy

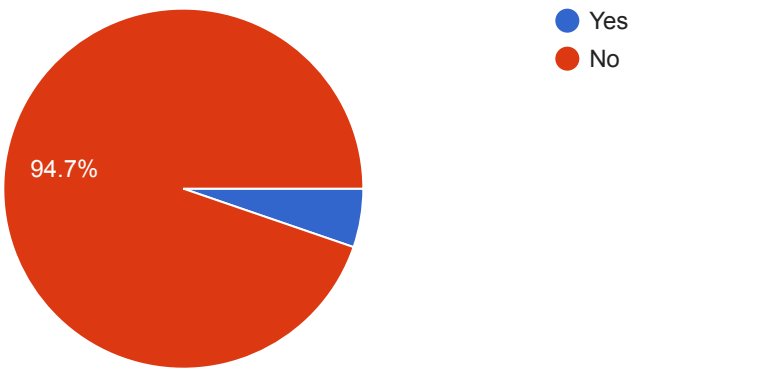
19 responses



10. Do you have any concerns regarding the development process in the project so far?

Copy

19 responses



10a. Please be specific. Add your comments.

19 responses

Thanks

-

Agenda was not well prepared by coordinator. It seemed if as the coordinator did not know who has to do what.

Thanks for everything

All is ok

For now all is good

I don’t think there are any concern because the tasks are clear and all the next steps have been assigned and cleared

.

Everything is good

Good

I have no concerns

I think everything is working well

I have no concern

Proje benim için faydalı oldu.

Everything it's good!

Thanks

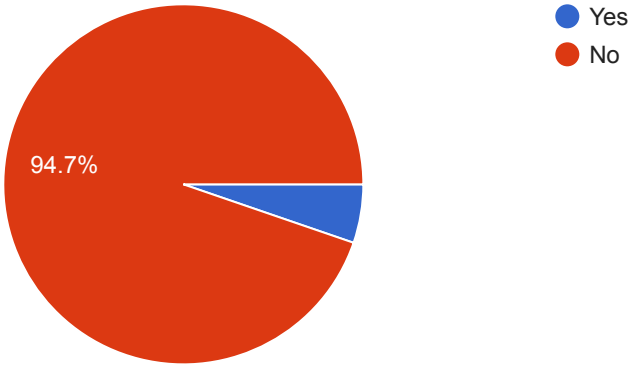
Content-related checks and feedback should be made during the content preparation phase.

It is a hard work procedure but creative as well

11. Do you have any conerns with the quality of the management or collaboration of the project so far?

Copy

19 responses



11a. Please be specific. Add your commets.

19 responses

-

It was a bit confusing

Tahanks

For now, evrything is good!

If we will have questions we will ask them

I found management and collaboration adequate for the project

.

Everything is good

No problem

.....

No concerns

In my opinion management and collaboration are already well organised

I have no concern

...

The turkish team is very OK!

Thanks

No

Collaboration and communication is in high level.

12. What would you like to suggest for the future cooperation / communication in the project?

19 responses

-

Please be clear in all objectives and maybe also ready the application one more time

.

The specifics tasks

to communicate to us exactly the tasks that we have to perform.

I think it’s already well organized

.

I want the meeting environment to be suitable

May be better room

...Í

thanks

Everything is already working well

Nothing

...

Clear task completion deadlines

No

Exact dates for study results, recommendations for control and correction during the study process.

Everything in good order, a couple of common organized meals would improve communication and understanding among partners.

13. Are there any other issues that you would like to point out?

19 responses

No

-

No thanks

Not for now.

Nothing

.

...

Thanks

Hayır.

Thanks for everythinks

Time that TPMs last is little.