

# MODULE 1 - COMMUNICATION

## ONLINE HIGH-FLIERS OPERATIONAL MANUAL FOR UNIVERSITY SCIENCE STAFF

A handbook to implement High-Fliers module 1

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THE STRUCTURE OF THE MODULES OF THE HIGH-FLIERS PROGRAMME:



ERASMUS+ High-Fliers – Highly Interactive Guidance Helpful for Leadership in Educationally Relevant Skills



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## OBJECTIVES OF MODULE 1

After this module, students should be able to:

- Put into practice advanced communication skills.
- Through interacting with CVs' be able name suitable characteristics of a STEM teacher.
- Based on acting in a role play, plan and implement a panel discussion for a project concerning "Educational Approaches to Characterize the Effects of Vaccination" in a school context.
- Plan and implement an educational work related to a previous topic to realize the learning objectives.
- Produce videos utilizing communication skills on "what is important in becoming a STEM teacher".

## STRUCTURE OF MODULE 1

Types of activities	Introduction/ Scenario setting (45 min)	Unit 1. STEM-educationalist (90 min)	Unit 2. Communication skills (90 min)	Unit 3. Panel discussions and workshop planning (90 min)	Unit 4. Workshops (90 min)	5. Ending session, feedback (45 min)
Pre-essay	+					
Introduction video	+ (3min)					
Workshops		+	+	+	+	
Materials (texts, handouts, exercises descriptions)		+	+	+	+	
Sum-up, evaluation, conclusion						+

Scenario setting	Contextualization/ De-contextualization	Re-contextualization
<p>Realizing own strengths and development issues related to communication through writing the essay.</p> <p>Assessing him/herself while filling the pre-survey.</p> <p>Evaluating the applicants for a STEM teacher position.</p>	<p>Creating links between the theoretical part and personal development alongside the theoretical sessions.</p> <p>Owing information during the panel discussion designing process and implementation.</p> <p>Sharing ideas and construct new ideas in pedagogical workshop sessions.</p>	<p>Post evaluation of the workshops and generally the overall module.</p> <p>Compressing the manuscript for the final video shooting.</p> <p>Considering personal development by discussing in the group.</p>



## INTRODUCTION/SCENARIO SETTING

### STRUCTURE OF ACTIVITIES

Activities	Time
Description of module structure, content and objectives	30 min
Scenario setting	30 min

Homework assignment	Must be done prior to the first contact hour! Title: <i>Describe what are communication skills and why are these skills important in working life?</i> Writing length: 1A page Return to teacher before: date set by the teacher before the first meeting	90 min
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### SCENARIO

After participants are introduced to the Module 1 structure, contents, and objectives and after they have completed the pre-survey, they are presented with the initial scenario for Module 1.

The scenario setting begins with collecting ideas from the pre-assignment, where the participants reflect on their thoughts about their personal communications skills. As a universal skill, it is important to think in which daily situations these skills are needed. And if they are lacking, how would it influence not only personal, but also professional, live.

The theme for this module was selected after COVID19. Part of science teaching, vaccinations cause a lot of feelings, but at the same time the discussions of it reveals enormously misinformation and mislead thoughts. Therefore, it is crucial to learn and deepen one's knowledge about vaccinations.

In the part on the project manager selection, participants need to digest the discussion topics and understanding about vaccination. There is a need to select a person with good communication skills and further thinking so as to create an innovative teacher culture.

## SESSION 1. STEM TEACHING AND BEING A STEM TEACHER

### 1.1. OBJECTIVES

After this session, students should be able to:

- characterize STEM teaching and the module content.
- recognize the importance of communication skills in professional development.
- analyse relevant targets during the requirement process.
- further identify one's own strengths and opportunities in professional development.

### 1.2. STRUCTURE OF ACTIVITIES

Activities		Time
Introduction	Introduction to the unit	15 min
	Theoretical part of STEM and interaction/ argumentation	20 min
Selection of the STEM development teacher	Introduction to the activity	10 min
	Group activity	30 min
	Reflection on the activity	15 min
Homework assignment	Reflecting on personal professional development through the given CVs' and finalize one's own selection due to given criteria.	90 min

### 1.3. MATERIALS

#### Introduction and definitions of key terms

**Communication skills** are part of generic skills, or part of 21st century skills. Further, these skills are relevant also in raising one's professional capacity outside of the teaching professions.

Communications skills consist of various subskills:

- listening,
- speaking,
- reading,
- writing,
- presenting (using ICT)
- and non-verbal communication.

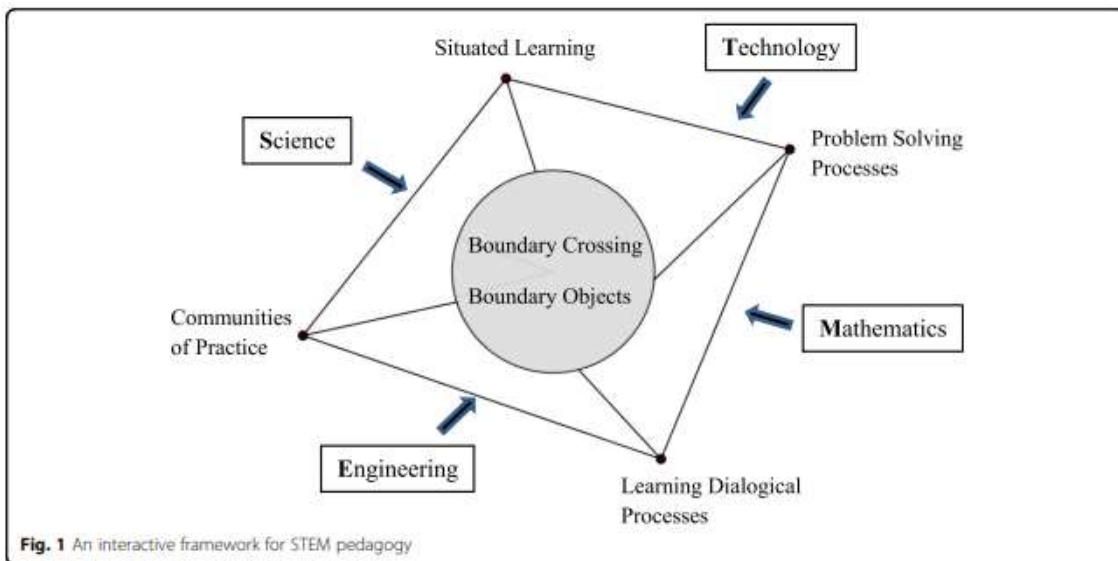
**STEM in education** refers to the words - **s**cience, **t**echnology, **e**ngineering and **m**athematics. In addition, STEM can be introduced as STEAM, thus including 'arts' into this multidisciplinary teaching method.

The aim of STEM teaching is to integrate different fields of knowledge and skills in the teaching and to increase the interrelationships and attractiveness of these fields in science studies.

To further support the pedagogical approach for learners, the teacher needs to reinforce the interaction and communication between the components and cultures in the classroom. **Mediation** within multicultural classrooms demands teachers make use of creativity, various teaching methods and



learning environments and especially support individual cultural characteristics of the learners (Abreu & Elbers, 2005).



Leung, A. 2020. Boundary crossing pedagogy in STEM education. *International Journal of STEM Education* 7:15.

### Analysing CV's

#### Introduction to the activity

Each student is given examples of CV's (Curriculum Vitae) of candidates applying for a STEM teacher position. The STEM teacher is expected to exhibit attributes, especially focusing on:

- Communication with experts carrying out science education research.
- Exhibiting scientific literacy and especially appreciating the nature of science.
- Exhibiting empathy while taking responsibility for providing sound advice.
- Enhanced managerial skills in a wide range of situations.

Based on the given criteria, students are asked to select the most suitable candidate for the open STEM-teacher position.

#### Individual activity phases and goals

The students are required to complete the following table by carefully analysing the given CV's. Each of the candidates has their own personal characteristics, which diversifies the analysing phase.

Applicant	Positive attributes	Things to be developed
Applicant 1		
Applicant 2		
Applicant 3		
Applicant 4		



## Reflection on the activity

The students, as evaluators, are asked to list positive attributes and aspects to be developed from each candidate within a common table. After completing the table, students have an overview on which to base their discussion before selection. The Further discussions should reflect on following questions:

Questions for discussion:

- Who could be the most suitable person to fill the open STEM teacher position? Why and why not the others?
- How easy, or difficult was it to analyse the CV's using the given criteria?



## SESSION 2. STEM TEACHING AND COMMUNICATION

### 2.1. OBJECTIVES

After this lesson, students should be able to:

- state suitable characteristics expected of the teacher.
- be familiar with the theory of interaction skills and argumentation relevant for enhancing communication skills.
- process panel discussions and arguments related to communication skills.
- describe the pedagogical workshops characteristics.

### 2.2. STRUCTURE OF ACTIVITIES

Activities		Time
Finalizing the evaluation of the STEM teacher applicants	Finalizing the previous activity and reflecting on the discussion points	15 min
Theoretical session	Interaction skills & argumentation	15 min
Activities	<i>Task:</i> Planning and holding panel discussions and argumentation. <i>Task:</i> Starting to plan pedagogical workshops.	60 min

### 2.3. MATERIALS

#### Introduction and definitions of key terms

**Interaction and communication skills** are a mixture of various attributes. Gray (2017) defines interaction as consisting of 6 different attributes i.e.

- actor
- partner
- relation
- activities
- context
- evaluation.

The IGI Global dictionary defines interaction as “student and lecturer form a communication network by regularly reading and responding to each other’s messages, mainly related to the course content” or “an occasion where two or more people communicate, collaborate or somehow react to one another”.





## SESSION 3. PANEL DISCUSSION AND WORKSHOP PLANNING

### 3.1. OBJECTIVES

After this lesson, students should be able to:

- plan, define and describe the process in the pedagogical workshops.
- understand the principles of panel discussion.
- be able to process panel discussions and argumentations.

### 3.2. STRUCTURE OF ACTIVITIES

Activities		Time
Introduction	Follow-up scenario prior to Unit 4	10 min
Panel discussion	Introduction to the exercise and to argumentation theory	10 min
	Preparing arguments and roles	50 min
	Panel discussion and reflection	20 min
Pedagogical workshop	Introduction to the exercise	10 min
	Planning (continues in the 4 <sup>th</sup> session)	20 min
Homework activity	Pedagogical workshop preparation	90 min



## SESSION 4. PEDAGOGICAL WORKSHOP

### 4.1. OBJECTIVES

After this lesson, students should be able to:

- plan, define and describe the process in pedagogical workshops.

### 4.2. STRUCTURE OF ACTIVITIES

Activities		Time
Workshop finalizing	Finalizing preparations	30 min
Workshops in action	Holding the workshops	60 min

Homework activity	Reflection on the module contents	90 min
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### 4.3. PEDAGOGICAL WORKSHOPS

**Pedagogical workshops** are a method to introduce learning objectives in an informal way by the teacher, or by the peers for participation in the learning activities.

#### Task

Each team presents their workshop outcomes (15 min) while the other teams act as participants (approx. 10 people). After each workshop there is a short feedback discussion (approx. 2-3 min).

Factors to consider during the designing of the session:

- The name of the workshop.
- Workshop perspectives, its rationale and target group (teachers of 7th-9th grade, or high school)
- Objectives of the workshop (taking into consideration areas of broad competences in either curricula for 7th-9th grade, or high school).
- Workshop materials, activities and timing.
- Planning takes place within each team working independently (guidance is given if needed).

#### Final report and evaluation criteria

Report evaluation workshop (max. 15 points.) To focus on interactivity (incl. communication aspects)

- Workshop name i.e. communicative relevance and attractiveness;
- The goals of the workshop and its justification, as well as identification of the target group (either teachers of grades 7-9, or high school) plus how well the argumentation of the issues has been successful (max. 3 p.).



- Objectives of the workshop (including, also, taking into consideration areas of broad competence in either 7th-9th grades, or high school, curricula) ensuring clarity of objectives and links to broad areas of competence (max. 3 p.).
- Workshop materials and activities, with timing related to innovation; inclusiveness and interactivity; encouragement for argumentation (max. 5 p.)
- Team's joint reflection on the functionality of the workshop indicating reflections on the level of versatility (2 p.).
- Sources.



## 5. END SESSION

### 5.1. STRUCTURE OF ACTIVITIES/TIME

Activities	Time
Sum-up, evaluation and conclusion: Re-contextualization of activities	20 min
Finalizing the module	10 min

### 5.2. MATERIALS

#### Sum-up, evaluation and conclusion: Re-contextualization activities

Participants:

- Undertake self-evaluation of their own communication skills.
- In teams, negotiate with other teams on what is planned plus reflect on and show how the results can finally be considered.
- In teams, answer the question:  
How best to summarize key communication skills learned during the module?
- Write planning notes on developing a manuscript for a 3-minute video, indicating why become a STEM teacher and aspects important in becoming a STEM teacher,



## REFERENCES

- Abreu H. & Elbers E. (2005). The social mediation of learning in multiethnic schools: Introduction. *European Journal of Psychology of Education*. 20: 3-11.  
[https://www.academia.edu/3597367/The\\_social\\_mediation\\_of\\_learning\\_in\\_multiethnic\\_schools\\_Introduction](https://www.academia.edu/3597367/The_social_mediation_of_learning_in_multiethnic_schools_Introduction)
- Gray, K. (2017). How to map theory: reliable methods are fruitless without rigorous theory. *Perspect. Psychol. Sci.* 12: 731–741. <https://journals.sagepub.com/doi/pdf/10.1177/1745691617691949>
- Leung, A. (2020). Boundary crossing pedagogy in STEM education. *International Journal of STEM Education* 7:15. <https://doi.org/10.1186/s40594-020-00212-9>

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