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WESTEM PORTRAITS

A FRAMEWORK FOR ACTION TO HIGHLIGHT ROLE MODEL WOMEN IN STEM

WESTEM

Introduction

The WESTEM Portraits is the framework that ties together the results of the Erasmus + WESTEM project. **Its importance lies in its aim of bringing together the discussion of women in STEM and highlight women from different cultural and socio-economic backgrounds as role models for girls who want to pursue a career in STEM**. Furthermore, this framework intends to bridge the gap between in and out of school life, by creating synergies among a variety of actors such as secondary and tertiary education students and faculty, academia and labor market, enterprises, and successful professionals from STEM sectors.

To achieve this, the framework describes a series of strategies for increasing communication and collaboration between female students, faculty members, and administrative staff, enabling their interaction with female professionals successful in STEM domains. **The participants in these activities will have the opportunity to interact with Role Models in Europe, using online tools, shortening the distances, and increasing the visibility of girls and women interested in STEM fields.**

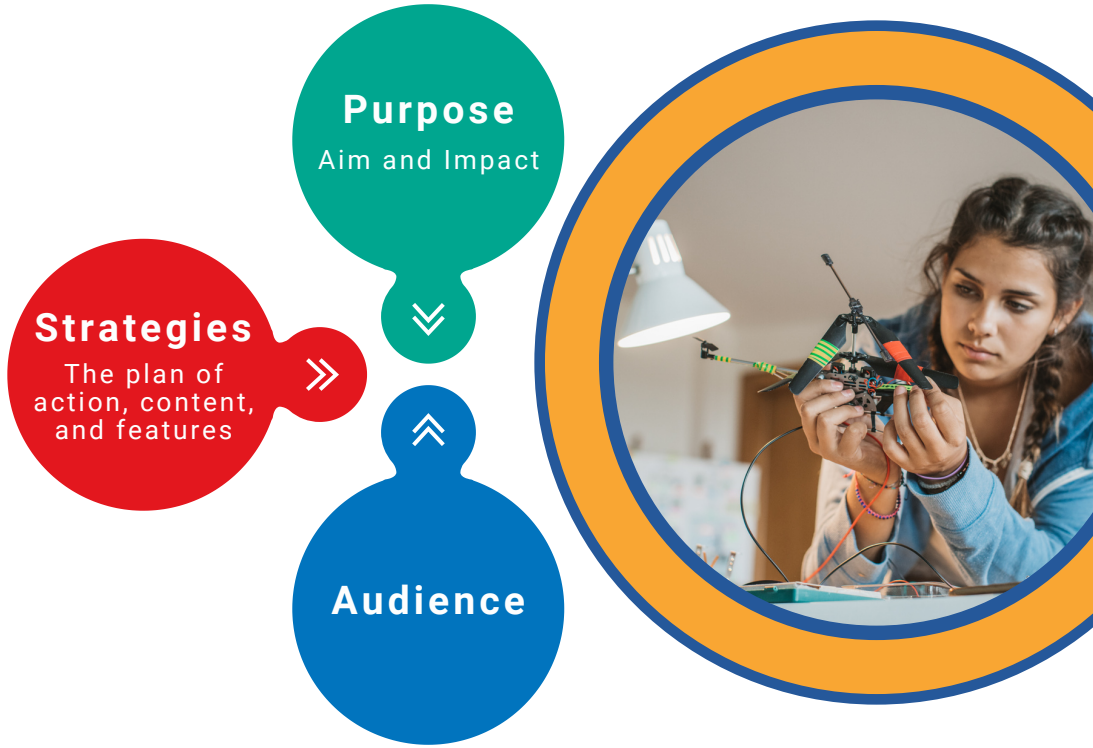
BESIDES, THIS FRAMEWORK AIMS TO:

- Empower High Education Institutions faculty (HEI) to consider pathways to collaborate with other stakeholders, in community settings and with the job market and industry at large, to bring an innovative and rich learning experience and incentives to their students.
- Inspire students, especially girls who will interact with female mentors and role models, to pursue STEM-related subjects and careers.
- Provide support mechanisms for students and promote role models for girls in STEM through an active and vibrant community hub for a more meaningful impact on the outcomes of the project.

Table of Contents

In this way, the portraits of women in STEM is a **puzzle-work that collects different initiatives bringing inspiration, information, connecting and engaging students and academia towards the same goal increasing the engagement of women in STEM education**. The framework is based on learning ecosystems theory which is defined as the connections between “people, knowledge, guidance, learning, colleagues, and experts in ways that optimize individual performance (...), these connections are developed in a shared work environment that supports learning, performance, productivity, and professional development with the right combination of content, processes, and technology." (Benedicks,2018)

For the WESTEM project, this ecosystem provides mechanisms for learning, professional development, information, and guidance, using diagnostics, toolkits, and educational scenarios for students, mentors, teachers, and HEI staff among other actors who will gain new insights and skills valuable to empower and ease the pathway for women in STEM, which are the ultimate target group. This means that girls who want to follow the STEM pathway, especially those coming from marginalized backgrounds, are at the center of the ecosystem and will relate to relevant information and resources to help them follow and reach their goal of following a career in STEM.



The Framework

The WESTEM project framework presents a guideline for organizations, education institutions and individuals who wants to continue acting towards a higher and successful engagement of women in STEM Careers.

This framework is a source of inspiration that traces our purpose, the strategies and the target audience.

1. Purpose

This first part of the framework refers to the ultimate goal of the project and what is the conceptual framework of the project, thus, the WESTEM project stems from **two goals of the Agenda 2030 for Sustainable Development Goals** and the representation of STEM sectors/domains (science, maths, engineering, and technology), specifically the Goal 4: Quality education and Goal and 5: Gender equality, mentioned here. These goals seek to achieve a better and more sustainable future for all, whilst addressing global challenges (United Nations, 2015).

Goal 4: Quality education: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

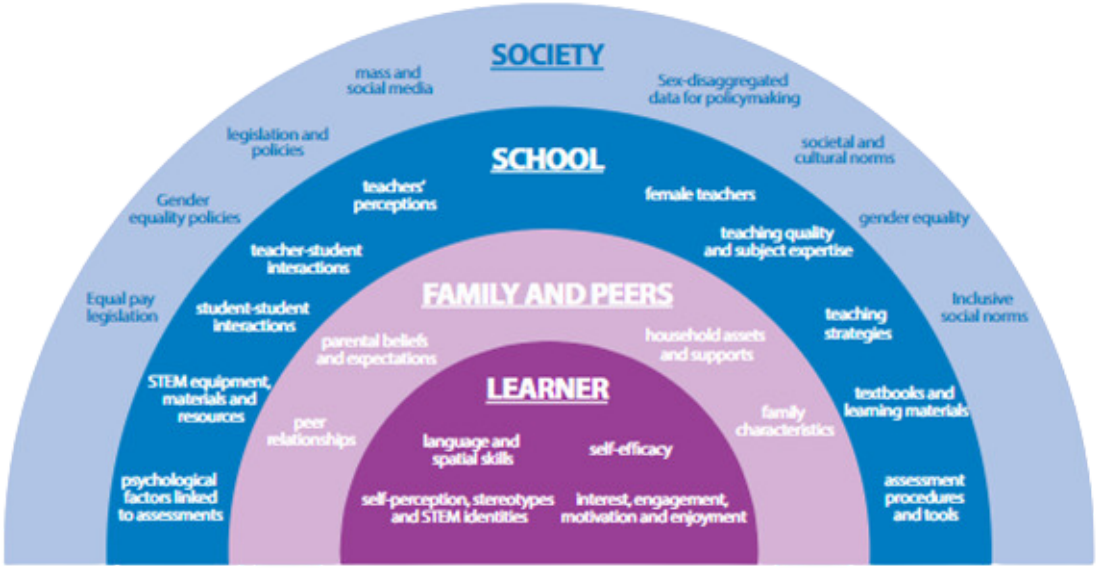
- 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university.
- 4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations.
- 4.c: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States.

Goal 5: Gender equality: to achieve gender equality and empower all women and girls.

- 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life.
- 5.b: Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.
- 5.c: Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.

Likewise, UNESCO portrayed on its book "Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM) 2017" the different factors influencing girls' and women's participation, progression and achievement in STEM education, for instance, **the need for belonging seems to lead many girls into programmes with a more supportive academic climate, whilst, "the lack of support, encouragement and reinforcement is detrimental to girls' intention to study STEM"** (UNESCO, 2017). This also still adds up to the gender stereotypes about STEM such as: 'boys are better at maths and science than girls' and 'science and engineering careers are masculine domains' which are factors influencing girls that are embedded in the family and culture dimension (see Fig 1.) and are evoked since the socialization of girls and boys at early ages, promoting the development of certain gender roles.

These factors explain the layers of complexity of gender disparities, with more or less variation among different cultures. Besides, it envisions the reach and impact of WESTEM activities targeting all levels of influence, highlighting the need for promoting positive and formative experiences i.e. raising awareness about STEM employment possibilities and prospects. Thus, **the community will work for enhancing girls' and women's self-perceptions** and attitudes toward STEM, as well as their motivation to pursue STEM careers by working with role models as they help to break down negative stereotypes and offer understanding about STEM careers.

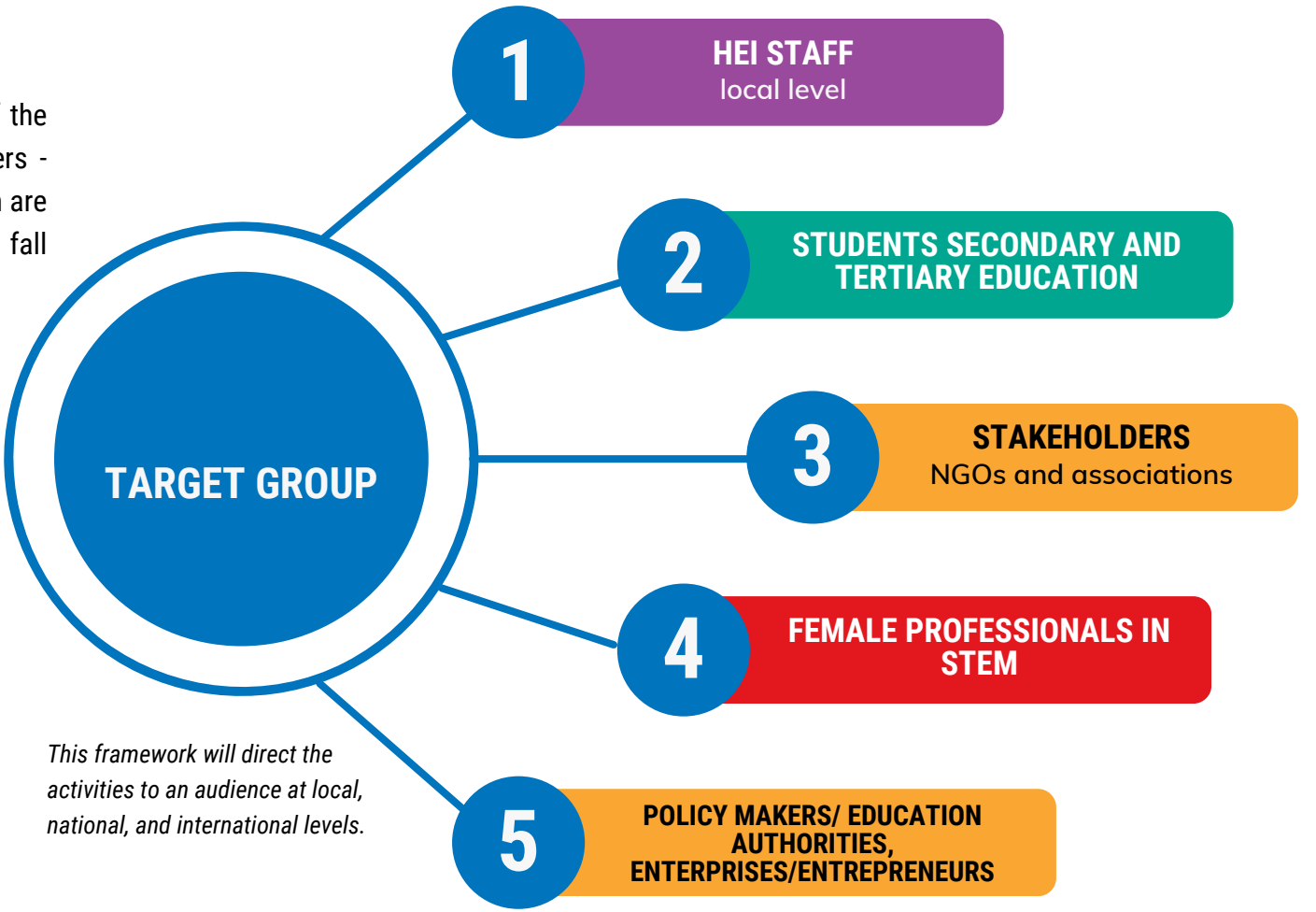


Taken from UNESCO book: Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM)

2. Audience

The main groups that are targeted are at the ends of the spectrum when studying or applying to STEM Careers - the female applicants, and the upfront receivers which are the high education institutions. Thus, the participants fall into five different categories.

It is important to include female students from a variety of cultural and linguistic backgrounds, different socio-economic contexts, educational histories; and those facing different day-to-day challenges in terms of social inclusion and integration.



This framework will direct the activities to an audience at local, national, and international levels.

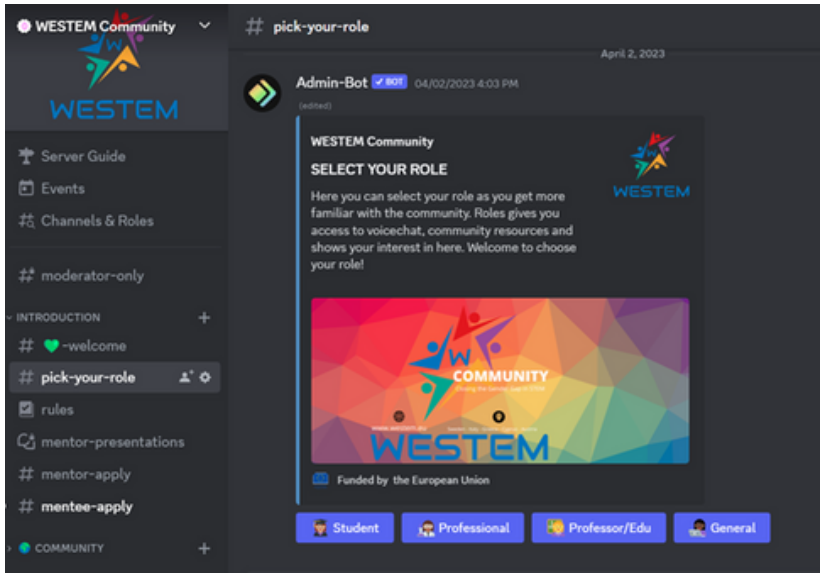
1. **HEI Staff & Teachers:** High education staff both academic and administrative/ supporting teaching faculty, teaching STEM courses at local/regional or national levels.
2. **Students**: Here they fall in two categories:
   a. Tertiary education female students studying STEM courses.
   b. Female students in secondary school, who attend public or private schools in the partner countries.
3. **Other stakeholders including:**
   a. NGOs and associations for gender equality at the local, regional, or national level
   b. Female professionals in STEM sectors at the local, regional, or national level
   c. Actors of interest: Policy Makers and Educational Authorities, Enterprises /Entrepreneurs.

3. Strategies

WESTEM PORTRAITS ACTIVITIES

3.1 The Community

The intention for this online community is to **grow into a vibrant group committed to empower female students in STEM**, acting as a support mechanism with influential female mentors, engaged teachers, universities and female students who will interact and encourage girls and women to pursue tertiary education in STEM studies and career paths.



THE SPECIFIC GOALS OF THE ONLINE COMMUNITY:

- Promote discussion within HEI to increase awareness of the difficulties, challenges and solutions that can be applied within the institutions to support female students in STEM careers.
- Bring together HEI, students, and other stakeholders such as industries and the job market to bring an innovative and rich learning experience and incentives to their students.
- Facilitate the interaction between role models and student girls to be inspired in pursuing or continuing STEM-related subjects and careers.

This is a virtual space open and accessible for all the target groups; where information, events, sources of education, training, and inspiration meet. The Online community can be joined from the website WESTEM.eu or directly into the WESTEM community on the Discord server.

It is free to join the platform, which contains basic tools and access to all channels, chats and video chats, both private and in groups, as well as sharing of files and materials. It is also possible to create or share events and podcasts and make web streaming which allows mass broadcasting for the topics that are going to be proposed for the community with special guest speakers.

The platform will also be the tool for mentor and mentee interaction in the mentorship program, but the mentoring can also be through local encounters.

Once participants join the community they will have guidance to set up a profile and to join for the mentorship program. A Code of conduct & rules for the community will be available to read and accept.

The community hub activities

MONTHLY ACTIVITIES	UNIVERSITIES and GENERAL GROUPS
WEB-SEMINAR	X
QUIZZ POLL / ARTICLE	X
QUIZZLET / ONLINE GAME	x
SOCIAL MEDIA CAMPAIGN / CHALLENGE	X
RESOURCES	Sharing of news, events, videos, articles and info related to the topic

The website has a feature to locate universities, schools, organizations, activities, groups, events and even persons (teachers, HEI staff, students, mentors, and women in STEM) from all over Europe. Further interaction can be possible behind the map by joining the community.

Throughout the active months of the community the WESTEM administrators will propose a series of discussions, activities, and challenges that the community can take part in. After this, the floor will be given to the participants by encouraging them to continue the discussions and keep the community active. This is an act of empowerment and engagement that will also ensure the sustainability and impact of the WESTEM project.

3.2 Mentorship

The intention of the mentoring program is to **provide a direct link for influential female mentors**, who interact with mentees while encouraging them to pursue tertiary education in STEM studies and career paths. **This relationship is dedicated to supporting the girls/women´s personal and academic growth over a period of four months, focusing on:**

The mentorship activities will happen on the digital platform Discord. This gives access to the participants not only to the mentorship program but to the discussions, activities, and materials of the online community. The platform allows private and group interactions via chat, phone calls, and video chat.

- Addressing career aspirations
- Advising the students in one-to-one relationships
- Fostering the mentees´ growth and accomplishing of goals

WHO ARE THE MENTORS?

Women who are pursuing or already have successful careers in STEM, in the partner countries of this project and beyond and who are willing to make available some of their time, 2-4 hours per month, as a give-back (for free), to **help young girls grow and develop in the STEM world.**

THEIR ROLE:

Encouraging and fostering the personal and professional growth of the mentee through the sharing of knowledge, skills, and experiences. The mentoring relationship is built on **mutual trust, respect, and communication**, and involves both parties meeting regularly to exchange ideas, discuss progress, and set goals for further development. (National Academies of Sciences, Engineering, and Medicine, 2019)

PARTICULARLY, THE MENTOR HELPS THE MENTEE TO:

- Learn more about STEM disciplines and discover opportunities for growth and professional development.
- Addressing existing biases and breaking down barriers and prejudices that can weaken the mentee's prospects.
- Supports the mentee in trusting her own talents.
- Advises the mentee on the study and work paths that can be relevant for them, considering the mentee's objectives and aspirations.

MENTORING INCLUDES CAREER SUPPORT TASKS BUT IS NOT LIMITED TO:

- Developing an identity as a STEM professional,
- Developing self-confidence in one's ability to work in STEM, self-esteem, and motivation.
- Help to successfully navigate in STEM culture.
- Helping mentees reflect and think critically about their goals, how to deal with bias, or how to overcome anxiety about assessments.
- Facilitating mentees' reflection on and exploration of their interests, abilities, beliefs, and ideas through regular feedback and encouragement.
- Helping students to realize their professional aspirations by including information about materials and strategies, goal setting, and opportunities for learning, networking, and meeting others interested in STEM.
- Provide guidance about financial resources (scholarships, networks, programs, and job opportunities)

WHO ARE THE MENTEES?

Female students in STEM studies, secondary school students, girls who are interested in pursuing a career in STEM and girls from disadvantaged groups.

THEIR ROLE:

- Sharing responsibility with the mentor for the quality of that relationship
- Clearly communicating their needs and expectations
- Show curiosity and keep up with the commitment made to explore opportunities presented by mentors.
- Learn about jobs, career paths, corporate cultures, and industries.
- Show gratitude to mentors for their time and regularly share feedbacks and progress.
- Question oneself and reflect on its own expectations.

MENTEES TASKS:

- Initiate communication with mentors by sending a request to connect.
- Commit to one to two hours per month for working with mentors.
- Plan and set the agenda for each meeting.
- Provide feedback to mentor and accept feedback from a mentor with an open mind oriented toward growth.

RECRUITMENT FOR MENTEES AND MENTORS

A general call is done through the partner's networks and on social media. Besides, a direct link is posted on the website so the participants can join the community and appoint to the mentorship program. The recruitment will open 3 weeks before the beginning of the activities.

MATCHING PROCESS & PREPARATION FOR THE MENTORS

Both mentees and mentors will have the opportunity to choose whom they want to work with. The mentees can check the mentor´s profiles in a forum post in the discord app and based on their preferences and needs send a request to connect to the mentor. Consequently, the mentors would be able to accept or decline the invitation from mentees.

PREPARATION FOR MENTORS AND MENTEES

Before the start of the mentoring program mentors and mentees will receive a manual sent via email / discord with a guide to the mentoring program, the different resources and an online seminar for mentors will be done to talk about the following topics.

- Generalities about the project WESTEM, what's essential to be a good mentor, and how to use the discord app for the mentoring sessions.
- Handling a guideline with the resources, tips, and topics recommended for the mentoring sessions.
- Explain the type and frequency of feedback and evaluation that the program entails.

A series of resources will be available in a forum to provide participants with relevant and inspiring information that facilitates their sessions. In addition, the mentors will have access to a preparation meeting online in which the topics above will be discussed.

3.3 Role Modelling - WESTEM Portraits

The intention of the mentoring program is to provide a direct link for influential female mentors, who interact with mentees while **encouraging them to pursue tertiary education in STEM studies and career paths**. This relationship is dedicated to supporting the girls/women´s personal and academic growth over a period of four months.

Thus, this section reflects on the following question: **What is a "best practice" of role models? The answer is examples of women pursuing, successfully completing studies, and working in STEM Careers overcoming the barriers that society, family, education, and work impose on them.**

The WESTEM project will **publish clips of interviews with the mentors and female role models** across social media, the community, and the project website. **Role modelling often works as emotional support** for a broader audience, where there is no need for one-to-one relationships. This section refers to the activities that showcase stories, interviews, or quotes from historical or relevant female models that encourage girls and women to pursue STEM Careers.

A portrait is a painting, photograph, sculpture, or other artistic representation of a person. The intent is to display the traits that make these women role models for other women in STEM. **For this reason, a portrait is not just a snapshot, but a composed image of a person.**

In addition to this, you will find links to biographies, quotes, videos, and other resources that will be shared on the community and social media to raise awareness and empower and inspire more women to follow the steps of these role models.

Note: For this project, it is important to address diversity factors as, "navigating power differentials between mentors and mentees, especially across racial or gender differences, reducing stereotype threat, and affirming a sense of belonging and science identity may contribute to a fuller representation of individuals from underrepresented groups in the sciences (…)" (National Academies of Sciences, Engineering, and Medicine, 2019) thus it is encouraged the inclusion of role models from different backgrounds to be relatable with girls and women from different cultural and socio-economic backgrounds.

Materials & resources

The purpose of the mentoring sessions is to help both mentors and mentees, to grow and develop, as well as to keep track on the mentoring sessions. To facilitate this process, the WESTEM project has put together a number of useful resources that both mentees and mentors can benefit from.

The resources are available in the discord community as well as on the website. Among them is a selection of resources that will help mentors and mentees to take the best from the experience of the mentoring. The resources also include inspiration, materials such as the mentoring agreement as well as tips and skills for mentoring.

Some of the topics and things that you will find among the resources are:

- Articles with tips for mentors
- Skills for mentoring
- Self tests for mentoring
- Topics and things to discuss during the mentoring sessions
- Material & templates for the mentoring sessions
- Toolkits
- Articles about gender wage gaps, gender equity and society
- Texts and videos about how women in STEM can overcome the obstacles and challenges they may face
- Tips on how to be confident in your role in STEM
- Videos on inspirational and historical women in STEM
- Resources specifically aimed at universities
- Networks for women in STEM

Bibliography & links

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For mentoring manual

University of Johannesburg (2017): *Mentoring Life Cycle*. Online: http://www.myllyviita.fi/Mentoring/orientation/mentoring_lifecycle.html. Access on: 6.3.2023.

DFK (2022): *Mentor – Erfolsfaktor für Weiterbildung – ein Kurzbericht*: Online: https://www.dfk.eu/news/mentoring-erfolgsfaktor-fuer-weiterbildung-ein-kurzbericht/. Access on 6.3.2023.

Together (2022): *4 Phases of mentorship: vital tips for relationships and programs*. Online: https://www.togetherplatform.com/blog/mentoring-relationship-phases. Access on 6.3.2023.

Useful links

https://stemfellowship.org/stem-skills-development-and-mentorship/stempowerment-mentorship-and-webinars/
https://www.stem.org.uk/stem-ambassadors/training-support/mentoring
https://stemsisters.org.au/initiatives/mentorship-program/
https://smartersociety.org/mentoring/
https://www.togetherplatform.com/blog/attracting-mentors
https://greekwomeninstem.com/gr/mentoring/
http://nowmooc.eu/index.php/inspiring-female-role-models/
https://ictr.wisc.edu/mentoring/mentor-evaluation-form-examples/
https://uwmadison.co1.qualtrics.com/jfe/form/SV_5jMT4fhemifK01n?Q_JFE=qdg
https://www.bestcolleges.com/resources/women-in-stem/
https://wcc.stanford.edu/events-programs/wcc-stem-program
https://girlsintech.org/mentorship-whats-it-all-about/