Guide to setting up a mentoring program for women in STEM

















"Having a good mentor early in your career can mean the difference between success and failure in any field."

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FEATURE

Nature's guide for mentors

Having a good mentor early in your career can mean the difference between success and failure in any field. Adrian Lee, Carina Dennis and Philip Campbell look at what makes a good mentor.

The Nature awards for creative mentoring in science were created on the premise that the mentorship of young researchers - although fully deserving of recognition - is perhaps the least remarked on of all the activities that take place in the lab. Indeed, there is no established definition of what constitutes good scientific mentoring. This article attempts to remedy that situation, drawing on the evidence from competitions for Nature's awards. These are held on a national or regional basis. with the most recent taking place last year, when the focus was on Australasia. Previous competitions have been held in the United Kingdom, and the next competition will be in South Africa (see www.nature.com/nature/ mentoringawards/southafrica/index.html).

The response to the competition in Australasia was remarkable, with more than 70 groups of 'mentees' submitting their achievements and the reasons why they believed their mentor excelled, with each of the nominated mentors giving a personal view of how they approach mentoring. The quality of applications was outstanding and the panel, all experienced in refereeing papers and grant applications, commented that this was one of the hardest evaluative tasks they had ever undertaken. However, there could be only two winners and they have been lauded elsewhere (see Nature 444, 966-968; 2006).

Having been involved in judging the awards - whether in Australia or in the United Kingdom - we realized that within the pages of the applications was an immense resource that could provide a basis for reflection on what comprises good mentoring. These reflections are presented here, with examples of just a few of the hundreds of quotable quotes included in reflect on your practices and determine whether there are lessons here that could see vou alter vour approach. Such changes could be to the ultimate benefit of those under your charge and, given the lasting and broad influence of good mentors highlighted by the competition, to science as a whole.

All the quotes included here were taken word-for-word from the applications, either from proposing mentees or the mentors themselves. For obvious reasons they have been depersonalized and are unattributed.

A mentor for life

CCM, without any doubt, sees all his interactions with people as lifelong. He always keeps in touch with ex-students, postdocs and so on after they have moved on. Even if he is not directly helping them, he keeps himself aware of their activities and at times informs them of things he believes would be of interest or useful, to them. He genuinely treats his ex-students and postdocs as part of an extended family. >>

mentees started out as students of the mentors but later became well-supported colleagues. But a distinctive feature of a the nominations supporting the mentors. The opposed to a great

with a career in front that the mentor helps

Personal characteristics Enthusiasm

First and foremost, M is incredibly passionate about science. She eats, sleeps and breathes science. Her enthusiasm is absolutely infectious, and it creates a wonderful atmosphere in her laboratory. >>

Colt is the nature of supervision that you have to explain/teach some key concept time after time as each new student arrives. Each time I had to make it feel to the student postdoc that it was the first time I had ever explained the concept; each time I had to tell it with sparkle to help inspire them to seek to know more. At times it was hard to stay 'inspirational'; but to fail would have meant to me that I should quit as a supervisor. You need to understand, as an old and wise friend once said to me, 'Remember, they stay the same age, you get older!">>>

Passion, enthusiasm and positivity were words dominating the majority of the mentee reports. Whether these are traits we can cultivate or create is debatable. The lesson seems to be that it is very important to be as enthusiastic about your students' research as you are about your own. If you are not, then the question becomes: is the student working on the correct project? If you are not passionate about their project, how can you properly support them? This should also be a lesson to administrators, who may sometimes allocate diency rather than a genuine concern for the students to projects and supervisors for expegreat mentor as student or indeed the staff member.

This guide was made for university staff interested in setting up or re-launching a mentoring program for women, especially students, in male-dominated STEM fields. In the framework of the Women STEM Up project, we designed it specifically for our partner universities, but anyone can use it.

Mentoring has been found to be a **key success factor** for marginalised groups within STEM. Especially for **women**, it has been shown to function as a facilitator for entering and staying in STEM fields.

Mentoring can be used for both **recruiting and keeping women** throughout the entire educational and career cycle.

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What will you learn about in this guide?





What are the key concepts to understand before setting up a mentoring program?





What is Mentoring?

Multiple definitions exist. For example, mentoring is typically considered to be "a relationship between a more experienced mentor and a younger, less experienced protégé for the purpose of helping and developing the protégé's career". For the protégé, we often use the term mentee.

Mentoring, however, can also be looked at more broadly: **peer mentoring** has also been shown to work well, as the mentor is more relatable having a smaller age gap, which can positively influence the mentor-mentee relationship.

The essence of mentoring is to **offer support** to the mentee in **personal and career development**, and as such, it is usually a series of guided conversations.

What is the role of the Mentor?

Mentors are advisers or facilitators, not supervisors.

Their role is to learn about the **needs of the mentee**, which can be career development, pastoral support, practical help, etc., and try to **provide the help needed** for the mentee to **grow and develop**.

It is the responsibility of the mentoring program to train the mentors in the processes, mindset, and toolkit, as well as to create and communicate the framework (ie. the mentoring program), within which the mentors will operate.

For a free and downloadable mentor training guide, check <u>our website</u>.

Who are the Mentors and Mentees?

Mentors can be:

- Professors
- Experts from the field
- People in senior positions in industry
- Undergraduate students
- PhD students
- Peers

A mentor does not need to have the exact same expertise as the mentee. Their role is to facilitate the mentee, professionally and/or personally.

Mentees can be...anyone! But are often people early in their career or making a career change:

- Undergraduate students
- Graduate students
- PhD students
- Career changers
- People working in the industry
- People wanting to be promoted

Anyone can benefit from being mentored. It is valuable to get feedback and guidance from another person.

Mentors and Role Models

Mentors can often function as role models.

Research has shown that having role models is a important factor that can make someone feel they **belong**, giving them the courage and the **inspiration** to enter or stay in a field where they in a minority, such as women in STEM.

But who can be a role model? Studies show: most of us! We all have the potential to inspire and support others.



How do you successfully set and communicate expectations about your mentoring program?





Setting Expectations

- 1. Define the **goals**, **the priorities**, **and the framework** of the mentoring program.
- 2. As an example, a **clear goal** is "providing practical and academic support to female undergraduate students in settling in for their STEM studies", aimed at first-year female students starting their studies in a STEM field.
- 3. Communicate them on the **program's website** and/or **launching event**.
- 4. Communicate them **to the mentors**, explaining what their role is and what they are expected to do during mentoring sessions.
- 5. Communicate the program's goals to the mentees, explaining to them what they can ask for and will receive during the program.
- 6. Ask for and **collect feedback** during and after the program to see if the expectations were in line.
- 7. Based on the feedback, **adjust your goals** and their communication.

Why is it important?

If the goals of your mentoring program were not set clearly and/or not communicated properly to any or either of the parties, it can pose a threat to the effectiveness of the program. Even if you had good intentions and gave support to your mentees, they may end up disappointed if their expectations were different.

For example, some mentees may think that mentoring is **supervision** and expect help in writing a thesis or an article, but the mentor may not have competence in their field, which is quite alright. But since it was not clarified to the mentee what this mentoring program aims to help with, they end up dissatisfied.

In other cases, the mentor may interfere with the academic work of the mentee too much, creating conflicts between the supervisor/research lead and the mentee, again leading to some negative evaluations.

It is best to have several iterations of the program to learn from the feedback.

NOTE:

To support this guide, we created a training video series to help you consider the different aspects of setting up a mentoring program for women in STEM education. These videos are linked throughout this guide, with the first being on the next slide!

Mentoring programs

Module 1: Expectations

What are some methods to match mentors and mentees to increase the chance of successful matches?





Main points to consider

- 1. Decide **what method** you will use to match your mentors and mentees: you can use a **matching algorithm** or **uni- or bidirectional choices** from participants.
- 2. **Communicate** the way matching will be handled and explain to the participants that **matching may not feel perfect** to everyone, but they will still benefit from mentoring.
- 3. If you would like to make the matching yourself, you can **collect info from both mentors and mentees** regarding for example **gender**, **field of interest**, **experience**, **location**, **or motivation**.
- 4. If you prefer to let your participants choose, you can leave it to the mentees or the mentors to choose, but you would still need to first collect relevant info from participants to display.

Why is it important?

Who the mentees end up with has a huge impact on how the mentoring experience will feel for them – and this also holds true for the mentors too. Therefore, **matching** is a central aspect of a mentoring program.

It must be said that **some will feel less happy** with the matching, and some will be more satisfied, no matter what method you use.

It is important, therefore, to **train your mentors** well so they can handle various mentoring situations, because then finding the perfect match is less important. It is also crucial to **communicate to your mentees** that mentoring is not supervision and they will benefit from conversations with a more experienced person, no matter what.

It is best to have several iterations of the program to learn from the feedback about how best to match mentors and mentees.

Mentoring programs

Module 2: Matching

For how long and how often should mentors and mentees meet?





Main points to consider

- 1. When launching a mentoring program, you need to define the **length of the mentoring program**. You can also define the **expected frequency of the meetings**, sometimes even the **length of such a meeting**.
- 2. Keep in mind that **long-term mentoring programs** are more effective, as they help build trust and have a more prolonged positive impact. Mentoring programs can last from **a month to several years**, and most often it is a matter of finding the budget.
- 3. The **frequency of the meetings** depends largely on the length of the program and the availability of the participants. Make sure you are realistic about the involvement of the mentors (and also of the mentees). **Leave some flexibility** to each pair.
- 4. It is a good idea to give guidelines about the **length of a mentoring session**. It typically varies between 20 minutes to an hour. You can either define the **overall hours** a mentor should meet with the mentee, or the **number of sessions**.

Why is it important?

Time has an important role in the success of the mentoring program.

The mentor or the mentee may **lose motivation** if **mentoring requires too much** of either them. This can mean too many meetings, or meetings that are too long.

If, however, mentors or mentees feel they did not have not enough meetings, or the meeting were too short, they may miss out on being inspired by one another or get the full value of mentoring.

Although the duration of the mentoring program and meeting frequency often depend on the budget available, it is still important to have various iterations of the program to see what participants feel was most effective.

Mentoring programs

Module 3: Duration

What are the benefits of individual vs group mentoring?





Main points to consider

- 1. When launching a mentoring program, you need to decide whether you will apply one-on-one mentoring, group mentoring, or a mix of the two.
- 2. Recognize that both individual and group mentoring have their benefits. In one-on-one mentoring, the mentee gets more **individual attention** from the mentor, which may give more tailored feedback to them. In group settings, however, **peers** can also function as a source of **support** and information.
- 3. Which to use often depends on the circumstances and the budget, but keep in mind that **different setups work best for different people**. One can be more practical with certain groups, while the other with other groups. It is best to combine them.
- 4. If the program has more iterations, you can check and see from the feedback decide which type or what combination works best for your mentees.

Why is it important?

People have different communication styles and needs; therefore, different types of setups might be better for different people.

In individual mentoring, the mentee gets **more attention** but it may become **too intense** for some and due to the fact that only person is involved, it might get one-sided.

In group mentoring, the mentee can benefit from interacting with more people, increasing their exposure to different experiences and solutions. However, not everyone feels comfortable participating in group conversations, so the chances of some mentees feeling neglected are higher.

Note that it can take training and practice for a mentor to be an effective group mentoring facilitator. If you're asking mentors to run group mentoring sessions, training and support around this are important.

Mentoring programs

Module 4: Relation type

What are the benefits of online vs face-to-face mentoring?





Main points to consider

- 1. When launching a mentoring program, you need to decide whether you will apply online mentoring, face-to-face mentoring, hybrid, or a mix.
- 2. Both e-mentoring and face-to-face mentoring have benefits, and which is used depends a lot on your circumstances and the budget.
- 3. Typically, it has an **added value** if the mentor and the mentee are in the same space, as it can **increase their bond**, strengthen the connection, and add to the perceived effectiveness of the mentoring.
- 4. However, when COVID forced mentoring programs to shift to online sessions, it opened up more opportunities. With **e-mentoring**, people who are otherwise far away can learn from each other, which can **widen perspectives**.
- 5. To address the **diverse needs of your mentees** when mentoring a group of people together, it is a good idea to try both.

Why is it important?

It is usually more effective when the mentor and mentee are present in-person, but online/hybrid solutions can overcome geographical boundaries. This is critical in the international academic and business environment today, where young researchers and professionals are strongly encouraged to be mobile. E-mentoring can often serve as a great boost in getting an insights into other national contexts.

However, it is important to compensate for the lack of face-to-face connection during online mentoring by allocating more time to build that personal connection. When meeting in person, it's easier to vary the context of the meetings, for example by having coffee or dinner together, which can build their bond. This bond is critical for trust, which allows both participants to open up, increasing commitment.

In order to increase the program's effectiveness, it is best to have **several iterations** to gather feedback about how well the two methods worked.

Mentoring programs

Module 5: Delivery method

What qualities should a mentor have?





Main points to consider

- 1. Be clear on what **qualities** and **attitude** is necessary for your mentors to be successful in your mentoring program, and be ready to provide them with a series of **mentor trainings**. For a **free and downloadable mentor training package**, go to <u>our website</u>.
- 2. Typically, the most important quality for a mentor is to be **empathetic** and **supportive**. **Inclusive language** is also vital.
- 3. It often helps if the mentors are **relatable**. It is a good idea to instruct your mentors on how much personal information to share, while also reminding them that they should avoid oversharing, as that can distract from the focus of the mentoring sessions.
- 4. Train them to be **proactive** and ready to apply a **coaching mindset** when mentoring. If the mentee would benefit from specific tasks beyond the usual conversations, mentors should be prepared with tailored activities.
- 5. Also, remind them mentoring is about helping the mentee to grow professionally, so mentors should be open to **sharing their resources** with their mentee when they are comfortable.

Why is it important?

The success of mentoring depends a lot on the personal qualities and attitude of your mentors. Therefore, it is crucial to train them, as well as collect and give feedback regularly.

Besides providing mentor training, make sure you also offer them **gender training**, which important for any mentor but especially within the frames of a **mentoring program specifically for women in STEM**, which requires self-reflection about **gender stereotypes and one's own biases**.

Mentoring programs

Module 6: Mentor qualities

What are the benefits of running a mentoring program?





Why is it beneficial?

A mentoring program for women in STEM is beneficial because it can increase women's participation in the field, which is not only a matter of social justice but the economic and technological interest of the world.

Mentees can benefit from mentoring as they are exposed to role models, professional feedback about their potential and growth, and receive support from a mentor and their peers.

But the **mentors** also benefit from taking part in a mentoring program. They can **learn** from and **get inspiration** from the mentee too, and in the mentoring process they can develop their **leadership**, **coaching**, **and communication skills**. That is, mentoring can lead to professional growth.

Mentoring programs

Module 7: Mentor's benefits

What do mentees and mentors say about their experience?





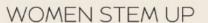
Farzana Quayyum

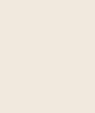
PhD Student Norwegian University of Science and Technology

"PARTICIPATING AS A MENTEE IN THE IDUN PROGRAM PROVIDED ME WITH THE OPPORTUNITY TO LEARN, REFLECT, AND ENVISION MY CAREER AS A RESEARCHER."









Mentee

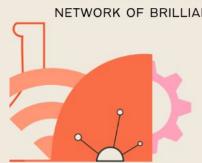
Testimonial



Nehir Yasan-Ak

Assistant Professor Akdeniz Universitya

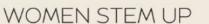
"HARMONY, DEDICATION, AND PRODUCTIVITY ARE WHAT THE PEER SUPPORT OF EUGAIN MEANS TO ME. THE COMMUNITY HAS SHOWN ME THE VALUE OF COLLABORATION AND TEAM SPIRIT, AND PROVIDED ACCESS TO A NETWORK OF BRILLIANT RESEARCHERS."



Mentee

Testimonial







Daniel Raffini

Researcher Universita di Roma La Sapienza

"THE PEER SUPPORT OF EUGAIN HAS
TAUGHT ME THAT TO STAND UP FOR A
COMMON PURPOSE CAN HELP YOU
OVERCOME EVEN YOUR OWN LIMITATIONS
AND DISCOVER POSSIBILITIES YOU HAD
NEVER IMAGINED FOR YOURSELF."







Mentee Testimonial



Geraldine Fitzpatrick

Professor and Mentor Technische Universitat Wien

"MENTORING IS NOT ONLY A MUTUAL LEARNING EXPERIENCE, IT IS ALSO A JOY TO BE ABLE TO CONTRIBUTE TO THE CIRCLE OF 'GIVE AND TAKE' THAT CREATES COLLEGIAL CULTURES OF SUPPORT AND CARE."



Mentor Testimonial







Letizia Jaccheri

Professor and Mentor NTNU

"AS A MENTOR I AM IMPRESSED BY THE AMBITIONS AND STRENGTHS OF MY MENTEES AND THROUGH THEM I LEARN TO SEE THE FUTURE."



Mentor Testimonial







Patricia Lago

Professor and Mentor VU

"AS A MENTOR I HAVE THE OPPORTUNITY TO GIVE BACK TO THE COMMUNITY AND PROVIDE THE SUPPORT AND THE FEELING OF INCLUSIVITY I WISH FOR EVERYBODY.."



Mentor Testimonial









BELFAST, UNITED KINGDOM

Austen Rainer

Professor and Mentor Queen's University

"I FIND MENTORING HELPS ME TO GROW THROUGH HELPING ANOTHER PERSON TO GROW.."



Mentor Testimonial







Anna Szlavi

Researcher and Mentor, Norwegian University of Science and Technology

"I HAVE A STRONG BELIEF IN THE POWER OF INTERSECTIONAL MENTORING. ONE OF THE MOST FULFILLING LEADERSHIP EXPERIENCES IN MY CAREER HAS BEEN WHEN A MENTEE TOLD ME I WAS THE FIRST LEADER THEY FELT COMFORTABLE TO COME OUT TO AND BE THEMSELVES."







This guide was made based on scientific research involving systematic literature reviews and focus group interviews, along with partners' mentoring practices, within the framework of Erasmus+ project Women STEM Up. See the references on the next pages.





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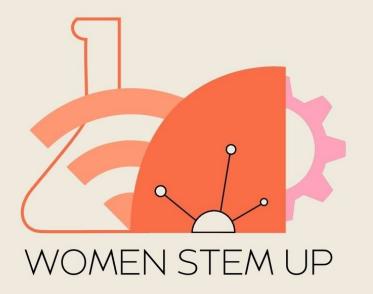
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