TOOLKIT FOR RECORDING HISTORIES OF WOMEN IN STEM

Purpose statement

Where are the voices of women's life experiences of working in science, technology, engineering and mathematics (STEM)? They are hard to find because they have so rarely been written down. This toolkit for capturing histories of women in STEM aims to change that: it is made for anyone who wants to help women in STEM tell their stories and make their history available for anyone to read, hear and share.

Produced by Electrifying Women International/University of Leeds for the members of the International Network of Women Engineers and Scientists (INWES), this toolkit supports INWES's mission *to build a better future worldwide through the full and effective participation of women and girls in all aspects of Science, Technology, Engineering, and Mathematics.*

CONTENTS OF THE TOOLKIT:

1. INTRODUCTION

Why capture histories of women in STEM?

The stories of women in science, technology, engineering and medicine (STEM) are far less often recorded than those of men: many histories of STEM still center on male achievement, without paying sufficient attention to women's many contributions to these fields. Recording women's work in STEM can ensure that their contributions are not forgotten: such testimony can illustrate the professional lives of STEM women across the world.

This toolkit is inspired by the "oral history" method, which is a means to collect, preserve and interpret the stories of people and communities. Typically, oral histories are used to record voices missing from conventional historical records. The process of oral history creates a record of people's remembered lives in the form of a personal narrative. These narratives give us insight into the experiences that might otherwise never be written down. By offering insights based on such first-hand memories oral histories can help to fill the gaps in our knowledge of history. In this toolkit, however, different means, which are not only oral, are offered as a way to record personal histories of women in STEM, which means we do not refer to the testimonies captured as 'oral histories'.

Why has this toolkit been created and by whom?

This toolkit is dedicated to the needs of female professionals in the international STEM community – especially but not exclusively members of INWES – who currently have no readily available means of preserving and sharing their own stories in the digital era.

The Electrifying Women International (EWI) project at the University of Leeds, UK produced this toolkit in collaboration with the International Network of Women Engineers and Scientists (INWES). INWES wants its members to be able to record and share their histories to better understand and celebrate what they have achieved. They also want to ensure that these stories are preserved in the archives so that many more women's contributions to STEM across the world can be recorded, whether INWES members or not.

It builds on interviews that have already been conducted by Liberal Arts undergraduate students at the University of Leeds, under the supervision of Prof. Graeme Gooday, and with assistance from Dr Emily Rees Koerner. The strategy adopted in those interviews was to have INWES members interviewed by other women – in this case, University of Leeds women undergraduates. Their work has contributed to producing this toolkit that we believe could enable *anyone* to capture the histories of women in STEM. The immediate purpose is to enable INWES members to interview each other. This could be both within their global regional networks but perhaps between them too. The regional networks include APNN

(Asia and Pacific Nation Network); ARN (African Regional Network); INWES Europe; and MENA (Middle East and North Africa).

Our students found that in many cultures, professional STEM women still encounter significant gendered barriers in speaking directly in the first person about their accomplishments. Faced with such barriers, we found that the interview model provided a more comfortable platform for women's stories to *emerge* in a conversational format – answering questions from an interviewer without prior assumption about what the answers should be.

As an international organisation, the toolkit is also designed to be readily translatable into different languages and it encourages those who use it to record their own/other women's histories in whatever language is most comfortable for them.

What does this toolkit provide?

This toolkit provides guidelines for INWES members and others who are interested in recording their own, or fellow members', histories. There is no assumed prior knowledge of conducting interviews, oral history techniques, or research ethics. As a result, it will take you through all the different stages involved in capturing someone's history, from getting started through to sharing and/or depositing it. After consulting the toolkit, you should feel confident to begin your own project with former or current women STEM professionals or working with your own stories.

Our emphasis is on interviews involving two people – an interviewer and interviewee (who can, of course, switch roles); however, many of the practical techniques included here could be used for anyone to record, transcribe, and share their own story – if they felt comfortable to do so.

2. GETTING STARTED: WHO, HOW, WHEN, AND WHERE?

Careful and thoughtful planning is the key to successfully capturing your own or someone else's story as a woman in STEM. Addressing the following questions will help you both to design your project, whether that involves interviewing someone else or focusing on your own story.

Some questions to consider before you begin:

- First of all, do you want to lead an interview or record your own story?
- If you want to lead an interview, who do you want to interview? A colleague/colleagues? An INWES member you find particularly inspiring?
- As well as interviewing someone else (or instead of), do you want to also record your own story?
- What is the interviewee's first language – do they prefer to be interview in that language? Or can they be interviewed in English and the interview

translated later? The same questions can be applied to capturing your own testimony.

- How many interviews do you think you will have time for? It is fine to aim for only one. Interviews can take time to conduct properly so it might be best to focus on a smaller number of interviews, if your time is limited.
- What do you want to find out from the person you are interviewing?
- Do you need to do any background research on the person you want to interview?
- Do you know the person you want to interview, or will you need to find a way to reach out to them (for example, via INWES)?
- How would you like to conduct the interview? In person? Online? Do you want to capture the audio of the interview? Do you want it to be visually recorded? Or would you prefer to capture written answers?
- Have you got the right equipment to conduct your interview using your preferred format?
- In what format will your interview be shared with INWES? I.e., video recording; audio recording; written transcript; mix of all three?
- Do you want to share it somewhere else, e.g., in an edited form as a blog post?
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You will find information in the toolkit to help you answer these questions, so you might prefer to read the rest of the toolkit first and then revisit these questions when you're ready to get started with the planning stage.

3. INTERVIEW FORMAT

In the internet era, there are various ways in which someone's history can be captured. These are some of the options that you might want to consider. If you are interviewing someone else, you will need to agree the format in advance with the interviewee (bearing in mind the time zone differences, if you will interview remotely). If you are recording your own story, you still might want to consider the best way to capture that story in a way that is most comfortable for you.

- Online video call – typically involving TEAMS, Zoom, or Google Hangout (or whichever video call platform you or your interviewee prefer). The video, audio, and transcript can all be captured from this format.
- Online audio call/phone call – mobile telephones typically can record audio.
- In person with audio and/or video recording
    i. Need to consider location – someone's home or a quiet corner of a public space will be best. Anywhere too noisy will mean you cannot hear the recording properly.
    ii. In person can be more personal and you might develop a better connection with your interviewee. If at their home, or in their personal space, they might feel more comfortable.

iii. This option is only available if you live in the same place as your interviewee or can travel to interview them.
- Audio or video recording of yourself speaking about your own experiences.
- Written interview/own written testimony (as autobiography).

4. ETHICS

Recording a person's history can reveal sensitive personal information about the interviewee's past life. Sensitivity is needed to respect the interviewee's views on how far such information may be shared. You should also be considerate of yourself if you are recording your own history and be prepared that the process might unexpectedly bring up some negative as well as positive memories. While ethical frameworks can differ according to country, we have compiled some general guidelines that can help you to approach your interview(s) with a clear understanding of the ethical obligations involved.

- Inform the potential interviewee about every aspect of the interview process in writing – especially what questions you will ask them; how long the interview will be; what scope interviewees have to add to their own perspectives; how the interview will be transcribed; how far they will be allowed to edit their interview afterwards; where the interview transcript will be made available; whether the interview will be published in full or in extracts; and what kind of access others will have to the transcript.
- Before setting up the interview, ask the interviewee to sign an informed consent form to document that they understand what the interview process involves, and that they are willing (provisionally at least) to proceed with the interview.
- This consent is revocable at the interviewee's discretion. Highlight to them that, even if they have signed the consent form, they may still withdraw their participation (and any interview recording or transcript) at any stage.
- Be clear with the interviewee about what happens to the original interview recording and transcript following the interview, especially if there are sensitive elements of personal data that have not been published. Be clear about the repository in which the recording and original transcript will be kept, with what kind of security settings, and how they can access this document.
- Even if an organization like INWES has generally approved a program of interviews for its members (and offered to host the interviews), each individual interviewee must have their permission sought as above.

Consent forms must be supplied for prospective interviewees, and they should ONLY be asked to sign such a form once you as the interviewer has:
- fully informed them about the purpose of the interview,
- advised them of their right to (re)-edit or withdraw their testimony at any time,
- indicated where and to whom their interview text will be made available,

- shown them the questions that they will be asked in the interview.

Bear in mind that interview subjects might decline to sign this form and thus withdraw.

A Sample Consent Form for interviews

I [INSERT NAME OF INTERVIEW SUBJECT] hereby confirm that I fully understand the purpose of the interview.

i) I have been fully informed about the nature and content of the interview process

ii) I have been shown in advance of the interview the questions that I will be asked and whether any follow-up questions, which I have not seen in advance, might be asked.

iii) I understand that I will be asked to review, and if necessary correct, all reports arising from my interview, and advise on which parts of the interview may or may not be published.

iv) I have been informed that I have the right, at any time, to withdraw my participation and any or all documents arising from the interview.

iv) I have been informed about the online location of where the selected interview materials will be published.

v) I give my full consent to being identified in this publication arising from my interview.

vi) I have been informed that I will be asked to review the final version of my interview and at that stage also that I make take the opportunity to amend or withdraw my testimony.

Yours faithfully

[INSERT SIGNATURE]

5. EQUIPMENT

The equipment required will depend on the type of interview you choose. Thinking about the equipment you require might help you choose which format of interview (see section 3) works best for you and your interviewee. You might also want to consider what technology the interviewee (or you yourself, if recording our own story) is comfortable with using and find out what format the interviewee might prefer, e.g., choosing between an audio-only or a video format.

Here is a list of the basic equipment required for the different interview formats:

- Online video call will require:
    i. Internet enabled device (computer, tablet, mobile telephone), camera and stable internet connection.

ii. A video call platform. Reputable online video calling platforms include: Zoom, Microsoft Teams and Google Meet.

- Online audio call will require:
  i. Internet enabled device (computer, tablet, mobile telephone), stable internet connection/mobile data
- In person with audio recording will require:
  i. Recording device, e.g., smartphone or digital recorder. If recording a video as well, you will need a video-enabled device, which most smartphones provide.
- To record your own testimony, you will need an audio or video recording device, e.g., in-built into a computer/tablet/mobile phone; digital camera with video capability.
- Written interview will require:
  i. You will need a way to send the written questions to your interviewee (e.g., email or postal service) and a way for them to send you their answers.
- If an interview requires translation, a translation software, such as Google Translate, can be used (though this would ideally be checked afterwards by a fluent speaker in the target language for errors).

6. PREPARING YOUR INTERVIEW(S)

Taking time to properly prepare the content of your questions and the format of your interview will help to make sure the interview goes well. Here are some things to consider when designing your interview. There are some example questions below and in the Case Studies section of the toolkit.

Creating your questions
First check what information is available in your interviewee's publications, webpages, curriculum vitae, and social media profile. Consider both what do you and others want to know about your interviewee that is *not* already there or that might need to be elaborated upon. And bear in mind also how you will make space in your interview for them to raise points not touched upon in your questions.

Below are examples of questions that you might want to ask. These are only suggestions and you can ask whatever you think might be most interesting/relevant. Send your questions in advance to check that the interviewee is happy to answer them and to give them time to reflect on them. You should also check if your interviewee is happy to answer questions that they have not received in advance – some interviewees may prefer only to answer pre-prepared questions, while some may be comfortable having more of a spontaneous conversation.

Example questions:

1) How did you become involved in science/engineering – what was your motivation for choosing this field? Which specialism did you choose and why?

2) What was your educational route into that area of science/engineering, and what kind of support (if any) did you receive from teachers, professional scientists/engineers, or others in entering this career?

3) What kind of support did you receive from family members in starting your career?

4) How usual or unusual was it for women in your region/country to enter science/engineering? If you are willing to comment on this, did you encounter any gender-specific or other challenges to entering that technical profession?

5) Where have your worked as a scientist/engineer, and who have you worked with?

6) What do you feel your main achievements have been in science/engineering – both working in professional teams, and as an individual?

7) What would you say to any young women now contemplating whether to enter the science/engineering profession?

Managing your interviews – have at least a provisional agreement with your interviewee on the following:

- How long will the interview last? Agree at least an upper time limit with the interviewee and reiterate that they can decide to stop at any time.
- How will you ask the questions: will you put the questions directly to the interviewee, or will you allow them to answer the questions in the order and format that they prefer, without interruption (unless they request a prompt)?
- If a remote online interview, agree a time of day when each of you can be sure to have minimal risk of interruption. Agree a plan of action in case there is an internet problem/failure at either end: have email or phones on hand to communicate if there is a more than a short-term 'glitch'.

7. SETTING UP INTERVIEW(S) WITH PARTICIPANTS

You will need to contact your interviewee to arrange a mutually convenient date and time, allowing for time zone separation. Based on previous experience interviewing INWES members, here are some ideas for how you can contact potential interviewees and make the arrangements for your interview(s).

- Contacting interviewees
    - Identify by whatever appropriate conversation which individuals you would like to interview. Contact them via email (or whatever method you

think most appropriate) to find out whether they are interested, explaining the purpose of wanting to interview them.
    - Explain the different formats that could be used, finding out which they would prefer.
    - Ask them which language they'd like the interview to be conducted in.
- Consent
    - Do not start to plan any interview until you have both sent the prospective interviewee the full interview information (see above) and the consent form (see above). Once they have sent you their signed consent form and you are convinced that they understand what is involved in the interview (especially the questions) and what will happen to the outputs from it (if published), you can then proceed to the next stage.
    - Send your questions with the consent form so the interviewee knows exactly what they are agreeing to and confirm whether they would prefer you to stick exactly to these questions in the interview or if follow-up questions can be asked (see above).
- Setting up the interview
    - Once you have all the consent forms and set questions signed and approved you are able to schedule when to conduct your interview, and also a mutually agreeable venue (if in-person) or online interview platform (such as Zoom, Teams or Google Hangouts). If conducting a written interview, agree how you will send the questions and how they will send them back.
- Preparing for an interview transcript
    - Indicate to your interviewee how the interview will be recorded and its text transcribed (options outlined view).
- Following up the interview
    - Be sure to explain to your interview how and when you expect to be back in touch with them to share the interview recording and draft transcript of it.

8. IN THE INTERVIEW

Interviews should be an open and enjoyable experience for both you and the interviewee. Here are some things you can do to try to ensure that the interview goes smoothly, but also to be prepared in case any challenges arise during the interview:

- Help your participant(s) feel comfortable about the interview process
    - If in-person be sure that the environment will enable easy conversation, with unobtrusive recording hardware.
    - If online, be sure that all audio and visual elements are working and that you can each clearly understand how the online platform works.
- Step-by-step guide to running the interview (works for both formats)

- Once your interviewee is comfortable, introduce yourself, saying who you are, and why you are doing the interview.
- Ask them if they have any questions or concerns – and if they are sure that they want to continue with the interview.
- Ask them if there are any constraints that will affect the interview – appointments after the interview, or topics that they feel must be – or perhaps must not be – covered in the interview.
- Ask the interviewee whether they want you to enunciate the questions, or whether they would prefer to articulate the questions (e.g., if the interviewee prefers to speak in a language with which the interviewer is not familiar).
- Ask them whether they would like the recording to be reproduced for other purposes (emphasizing that they can say no), e.g., for a podcast or a blog post. This should also have been included in the consent form.
- Once they are content in the above regards, ask the interviewee if it is OK to start recording the interview, and set up any transcribing software (see below).

- Negotiating difficulties, including sensitive topics
  - If the interviewee experiences an emotional moment – perhaps temporary distress brought on by the interview bringing back an uncomfortable memory – you should pause the recording.
  - If there is an interruption (e.g., external noise, personal intrusion, or internet glitch) again pause the recording until the interviewee is settled into giving their testimony.
  - If the interviewee digresses significantly from the interview topic (this can happen if they are nervous, or also very relaxed) then find ways to gently nudge them back to the main topic – e.g., by reframing the main questions.
- Ending the interview
  - When the agreed time limit is approaching, ensure that you let the interviewee know this, and ascertain whether they would prefer to extend the time period for talking, or stop then (and possibly arrange a follow-up interview). Thank them for their interview and tell them when you'll be in touch.
- After the interview – follow up with a plan for discussion the recording and transcript.

9. TRANSCRIPTION AND EDITING

After the interview has been recorded, it is normal to create a transcription (a written version) of the conversation.

We recommend using a transcription software to do this as it is much quicker than trying to transcribe it yourself. Experts recommend using the software Otter https://otter.ai. Otter is free to use for up to 30-minute recordings and can be used free up to around 40 hours a month. Otter can also be embedded in both Zoom and TEAMS software so that it performs the transcription task within those platforms. If you prefer (for any reason) not to use Otter ai then the professional versions of TEAMS and ZOOM can both offer their own inbuilt transcription formats.

Bear in mind that the transcription software does not always produce a perfect script.

- There will be spelling errors, especially of names, that you will need to check for and correct in the editing process.
- There will be various vocalizations such as 'um', 'urgh', 'ah' and 'er'. It is likely that the interviewees do not want these to feature in the transcript, but you should check with them before you edit them out.
- You may want to silently correct any minor grammatical inconsistencies in the text, but if you do this, let the interviewee know.

Once you have produced a version of the transcript that you think is both a reasonably accurate, yet also easily readable version of the interview, make it available in an easily editable format e.g., Microsoft Word (or some other mutually agreeable format).

Then email the text to the interviewee for any comments, corrections, additions or deletions that they might offer – or indeed follow-up conversations on those or other points.

You will need to store both the transcription and the recording securely and ethically (see section on Ethics).

More information will be provided by INWES in due course about the preferred file formats for sharing the transcript and the audio/video files.

10. SHARING YOUR INTERVIEW/WRITTEN TESTIMONY

Once you have versions of the recording and the transcription that your interviewee has agreed, you can then share it with INWES senior executive which is currently formulating a policy for storing the data collected during interviews in an appropriate archival repository. If interviewee permission has been given, INWES may showcase parts of the interviews on their website.

You may also want to consider – if you have permission from your interviewee and it is of interest to you – turning the interview into your own publishable output after some editing. This could include:

- A blog post – many blogs might be interested
- A podcast – e.g., to upload to Spotify
- An article – a professional newsletter or magazine (e.g., one managed by INWES)

- A video, which could be shared on social media/video platforms like TikTok or YouTube

Remember to share all outputs with your interviewee before you post them.

11. CASE STUDY

Here is an example of an interview undertaken with INWES President, Jung Sun Kim by University of Leeds student, Maeve Gallagher.

Transcript of Interview with Prof. Jung Sun Kim, by Maeve Gallagher

Date of interview: 22.02.23 11am UK (7pm South Korea)

Maeve Gallagher
You obviously have extensive experience in your scientific field and your role as a professor of Biomedical laboratory science. But how did you initially become involved in this field, and was there a particular motivation for sort of choosing this specialism?

Jung Sun Kim (게스트)
Well, when I was a student in middle school and high school, I actually did pretty well in my math classes and chemistry too. I wasn't particularly an excellent student in physics, but I think in chemistry I did quite well, and mathematics generally was you know a field that I tended to excel in, so naturally my goal was shifted towards the sciences. At the time I was a student, and I think it's a long time ago, science and engineering in my country was considered a more difficult area of study, especially for girls.

And so, there was some kind of pride, I think, within myself when I excelled in these fields and I thought that, yes, well, I can do good in these fields. I should go into chemistry. So I decided that I will major in chemistry when I went to college. But then my parents, in particular my father, was hesitant. Not discouraged, but he convinced me to go into an applied field which would ensure better jobs for job securities. And so he suggested I go into pharmacy.

At that time in Korea, the College of Pharmacy was considered a very high-level prestigious school for students who did well in their academic studies. Thus getting into the College of Pharmacy itself was actually a source of pride to myself and also to the family. And at that time, although I did not know what that field would be like, I was told that it would involve a lot of chemistry - which I liked very much.

From then I studied pharmacy and became a pharmacist in the sense that I passed the board exam. I have a license, with which I never practiced by the way. I went on to Graduate School. I majored in pharmacognosy for my Masters degree, which was - I don't know if you're familiar with pharmacognosy? It's a plant-medicine related field: plant chemistry and

some Physiology and pharmacology related study. So, it's for plant-related drug development. Then I went to the US to do my PhD in medicinal chemistry. (At that time it was not very common for girls to go abroad to study by themselves - families would want their girls to get married first and then go abroad to study with her husband.)

I received my PhD, and then returned to Korea. And this was the first time in my life that I realized that it was not easy being a woman in science or engineering. Jobs were not waiting for me. It was very difficult. I was married at that time. My husband was in a very similar field, but he got a job in academia as soon as he received his degree. For me, it was five years waiting and even working in other fields, so it was a very big period of frustration. After five years of receiving my PhD, I finally got into a job in the university where I work now but there was no pharmaceutical science or chemistry department. Fortunately they had the biotechnology department, which was close to my field of studies. And then I moved onto (actually started) the Department of Biomedical Laboratory science, and this is where I am now.

Maeve Gallagher
That's very interesting. Thank you. How did you find moving from the pharmacology to then the biomedical side. Was that a big transition?

Jung Sun Kim (게스트)
Pharmaceutical science itself is a convergent field where it involves chemistry, biology, pharmacology, physiology etc. Those who graduated from this field tend to feel that they can do anything related to any of these fields. So, there was this confidence which later on I find out was very dangerous. But anyway, you know, I said, well, I could do biology, I could do chemistry - I could do anything that involves these fields (in terms of teaching undergraduate classes and/or research). So, getting into biomedical laboratory science was not a big hindrance on my part because I thought I could handle it.

Maeve Gallagher
Interesting, thank you. You mentioned your educational route and support from your father and how that changed. Was there any sort of support from other family members or teachers or any sort of professionals?

Jung Sun Kim (게스트)
For me, I would say I was very fortunate to have a father who was very supportive. At the time that I was going to school in my country, not all parents were very encouraging to their children, especially their girls, to go into science and engineering.

For example, my grandfather from my maternal side, was a very conservative man and he used to say that 'I don't believe that girls should go to college'. He used to say it in a joking way, but I think he really meant it. And he said that, you know, 'you're gonna get married and have a family. Why would you need a college degree?' I went to college in 1980 and it was a time when women were expected to stay home once they married. They could have

jobs before they're married but once they were married, they were expected to be full time housewives. So very, few women actually had jobs and work after marriage.

So, in that sense I think my father was very helpful in the sense that (ever) since I was very young, he always encouraged me to do what I wanted to do as a person. Science and engineering was also, in a way, an influence from him. He was a social scientist, he himself studied sociology and economics, but he encouraged his children, including myself, to go into either medicine or science or engineering. So, it was something that he believed was very important and I'm very thankful for having a father like my father. I went into pharmaceutical science and my sister, although she was thinking of majoring in French language, my father convinced her to go into computer science. Going into science and engineering is an influence that we had from our father.

Maeve Gallagher
That's great. Thanks very much. You've mentioned gender issues in South Korea and you touched upon how it might have been unusual for women in South Korea to enter fields of science and engineering. If you feel comfortable talking about this, did you encounter any gender-specific challenges entering this world and maybe felt the difference also because you had studied in the US as well?

Jung Sun Kim (게스트)
I went to an all women's university. It's actually one of the oldest universities in Korea. It's called Ewha Womans University and because I went to an all-women's university and because I had a very supportive father until I was doing my bachelors studies, I did not encounter any gender inequalities: I did not think that this would be a problem or something of a barrier in my life. You know, looking back, I think at that time I was quite arrogant in the sense that I would think that, it was the women themselves who were not taking on their roles seriously and giving up to society to hold these norms.

I didn't think that it was going to be a problem because I was actually very well protected within my studies, as I mentioned earlier. It was after I returned with my PhD when the reality struck me.

Maeve Gallagher
Did you enjoy being then at an all-women's university? Was there a measure of solidarity together?

Jung Sun Kim (게스트)
Yes, well, honestly, and I think many of my classmates agree with me: we used to talk about this a lot. My generation of parents wanted their daughters to go into an all-women's university like Ewha, so my university was a preferred university for, so to speak, 'smart girls'. Because parents feel very comfortable, they feel that their daughters are well protected and also because some parents (not my father) thought that going into this university would ensure a husband of, you know, high social stature. So that was kind of the image of the university that I went to.

When we were entering university as a freshman many of our classmates would say, well, we didn't want to come to this school, we wanted to go to a co-ed school. But then as we went on first semester, second semester and then going on to sophomore year, we look at our friends who have gone to co-educational institutes and we see that we had so much more freedom to do what we wanted to do and what we could do. I had a friend who was a very smart girl. She went into the best university (in Korea), which was co-ed. She used to be very active and very proud girl. And I see her becoming more and more discouraged to do things. And this was because of the environment at which she was placed. She used to say how difficult it was for her to fit in, especially because she was in mathematics. Girls tended to be, you know, less in numbers. And so, they were minorities and (thus) surviving or enduring the environment was difficult for many of them, which we (at all women's university) did not experience. For example, girls who went to co-ed schools, when they do their club activities, or you know when they (have to) do things with the boys, It was taken for granted that the boys would do the nailing, and the hard machine work, while (for) us because we were all girls, we did everything ourselves. And we had so much more freedom to do what we wanted within the campus. You would see us just lying in the grass doing discussions with our books open, which was impossible to do in a co-ed school at that time; not now, but at that time. In that sense, as we progressed to our higher school years, we were quite happy with the environment in which we were given.

Maeve Gallagher
Interesting. Thank you very much. You mentioned when you came back, you were then working as Professor at the same place you are now. So, I'm assuming that's the sole place you've worked since then?

Jung Sun Kim (게스트)
No. When I came back it was of course very difficult to find a job. I went through a lot of interviews, I put in a lot of applications and every time I went for an interview I was encountered with questions regarding my age. (A women older than her boss with a higher degree like Ph.D. was not an advantage many times).

For example, I almost went to an interview in a pharmaceutical firm and unofficially someone had told me that I was turned down because my boss, who was a man, was a year or two younger than me. They could not accept the fact that I was older and a woman. And, you know, he had to be my boss so that was going to be something very uncomfortable for him and so they would prefer not to hire. That kind of culture used to prevail. It was, difficult yes. I worked as a postdoc in a National University. I really enjoyed working there because I was able to produce a lot of publications at that time. I did a lot of research and at that time I had good publications. Looking back, it was a very meaningful and precious time for me, but it was also a very difficult time in a sense that there was not much hope that I could see in securing something of a permanent position.

It took more than four years until I found the position where I'm working at now. That is after four years when I did part-time teaching and I (even) thought of leaving the science

field and going into something totally different. But then very fortunately I found the position where I am now.

Maeve Gallagher
So you've come into this position and had this inspiring career. What do you feel your main achievements have been in science, both working in professional teams and as an individual as well?

Jung Sun Kim (게스트)
In terms of sciences, when I was doing my PhD, I was working on drug development studies. My major is medicinal chemistry and I synthesized drug derivatives, what we call drug targets in terms of compounds. I think I synthesized more than 150 compounds at the time, and I was able to publish the results in very prestigious journals, *The Journal of Medicinal Chemistry*, which is actually one of the most competitive journals in ~~in~~ that area; so I was quite proud of that. And then when I came back, when I was doing my postdoc at Pusan National University I worked with natural products: marine sponges. We isolated new compounds and we did structural analysis of these compounds and I was able to get very good publications from there as well.

There was a period where I couldn't do much research until I settled into my university, and I started the project on what we called Quorum Sensing. And it's again something that has to do with biofilm inhibitors. I don't know if this is going to be a familiar term, but anyway I worked on mechanisms and possible inhibitors of biofilm where I was able to get some (good) publications. So as far as science is concerned, I think I was quite proud of the results that I have gotten. But then the things did not work too favourably on my part in the sense that the difficulty of doing science is that you have to have the resources and you have to have the labs support, which was not really possible at the university where I am because we are a more of an education-oriented university rather than research oriented. So, there was a time when I had to make a decision as to whether I really wanted to go on with the research involving a lot of experimental work, or whether I shift to something more theoretical or more policy-related. And so that's when I decided to go into Policy Studies and my involvement with the women's network started then. And thus, my involvement with INWES and KWSE and since then I have been more focusing on our policy-related work rather than scientific research that involves a lot of experiments.

Maeve Gallagher
You mentioned INWES and being a strong figure at the head of this network working to uplift women. What would you say to any young women now contemplating whether to enter the science or engineering profession - women going into where it might be male dominated or slightly intimidating?

Jung Sun Kim (게스트)
I would say that please don't give up.~~-~~I know this is something that the young generation would not like to hear, but we tend to say that the situation that you are in is better than when I was entering the (science or engineering) field after graduation. But I very carefully

say this because it may not be true and through the studies that we have been doing with INWES, we realized that the outward looking situation seems better. But if we look at the gender barriers that still exist in the scientific fields, the barriers that the women are perceiving may not be too different from what we, the older generation, have been experiencing. In terms of the collective numbers, yes, there are more women now in terms of numbers - not enough - but there are more. Seemingly it looks like the situation is improving, and I carefully say that very slowly, there is some improvement but it's not the best situation for girls yet.

But I don't think that should be a discouraging factor, and I would say to the young girls that there are mentors and there are a lot of women who are willing to be supportive. And so, to that, I would ask them to join in the women in STEM networks to get the support that they deserve and that they can enjoy: do what they believe in and do what they really love doing. The surroundings and the environment may not be as encouraging or helpful sometimes, and they may say 'well why do you want to do such a thing when it's such a difficult thing and there is an easy way out'. But I would urge them that it's worth the risk and it's worth the difficult times because there's so much more satisfaction that you will get when you enter the field that you know you can do well in.

Maeve Gallagher
Thank you very much. And just to final question, obviously you've been working with INWES for a while now and I think it's been really inspiring. How have you found it working with people all across the world from shared experiences that were collective?

Jung Sun Kim (게스트)
Well, my experience with INWES started in 2003 and this was a little bit after I settled in my university in 2001. And as I just explained, I had 4-5 years of very difficult times. And that was when I said (to myself) there must be a group of women that I could relate to. So, I looked for an organization and that's when I found KWSE where one of my mentors was president. So, I signed up for membership and I started becoming a member then. Coincidentally, that was the time when the first international conference was held in Korea, and that was (when) the interim board meeting of INWES (was held). So, the board members of INWES came to Daejeon Korea and they needed someone to help with the translations because the women scientists in Korea were not very comfortable with the communications in English. I was very fortunate to be speaking English better than many of the colleagues then so I was asked to come and help with their translation. That's when I met Gail Mattson, Claire Deschênes, Sue Bird, Monique Frize and all the wonderful women who started INWES. I really enjoyed being at that meeting and that's when I could see that women from different countries shared common difficulties and it was very, very interesting to hear their stories from the Americas, the UK, the West. We heard all these stories which were not much different from what we were experiencing in Korea. That was the first time that I realized that there is something common among women in STEM in all countries that can be shared and because of that experience, there was this feeling of support and encouragement I felt for the first time with these people. I thought that I could share this

with my colleagues and my students in Korea. This is when I started becoming actively involved with INWES.

Maeve Gallagher
Great. Well, thank you so much. That's all the questions I have for today but thank you so much for taking the time to talk to us and I hope with our group project which we've been working on, we can tell these stories as much as possible and do what we aim to do and big up INWES. But that's all from me, thank you so much. Really appreciate it.

Jung Sun Kim (게스트)
Thank you. I enjoyed speaking with you.

12. FREQUENTLY ASKED QUESTIONS

How much of a problem does a language barrier pose/how would you overcome this?
It might be the case that you are interviewing someone who does not have the same native language as you. It can be challenging for interviewees to answer questions fluently in their second or third language and this can lead to answers becoming misconstrued. As the questions are personal, reflective of their life and career, interviewees will want to be able to express how they are feeling as accurately as possible, which can become increasingly difficult with language barriers. Here are some ways you might overcome this:

If conducting an interview:

- **Allow interviewees to speak in their first (/preferred) language**, even if, as an interviewer, you are not fully able to understand. If you can, use an automated transcript (which can be changed to interpret various different languages), or even with the retrospective help of your interviewer, you can produce a transcript which can then be translated into any language.

- **Send your interviewee the questions prior to the interview.** Sending a list of questions before asking them in an interview will give your interviewee time to think and produce answers, and also communicate on what they are comfortable with answering. Without this, an interviewee can feel caught off guard and will say something that they might regret or be unable to think of an answer for. If an interviewee has time to consider the questions, they will most likely be able to answer more fluently in the interview.

- **Speak slowly or word interview questions as simply as possible.** With a language barrier, the most important thing is to allow your interviewee to speak in their own time and to make the questions as easy to understand as possible. If you say the questions too fast or do not enunciate enough, this will make it difficult for the interviewee to understand what you are asking of them. In speaking slowly, it not only communicates your willingness to listen but will build a rapport.

- **Make adjustments to the transcript.** If speaking in a language that is not an interviewee's first, it is very normal for hesitations, filler words, or atypical grammar, which will most likely appear in the automated transcript (if using one). When editing the transcript, any discrepancies can be edited out to make the final version grammatically sound and easier to read.

If recording yourself:

- **Record in whatever language is best for you.** INWES is a global organization, and they want to encourage as wide a range of participation in as many languages, and from as many places, as possible. As with recording in any specific language, while it will make it inaccessible for some, it will also increase accessibility for others. If you produce a transcript afterwards, this can be translated into different languages and made available to others online.

How do you ask/introduce questions that are personal?

If conducting an interview with another person:

- **Send your interviewee the questions prior to the interview/consider your own questions before.** Sending questions prior to the interview or considering them yourself allows you or your interviewee to formulate a response so that they are not surprised when being asked, and equally allows them to communicate with you on whether they are uncomfortable with certain questions. This allows you to avoid awkward pauses during the interview.
- **Build a rapport.** While there is not a formula for how to do this, the more your relationship with the interviewee is developed, the more they will be likely to open up about questions that are potentially more sensitive. Introduce the interview slowly and start off with informal, introductory questions such as 'how are you', 'can you tell me a bit about yourself'. Be prepared to open up about yourself; while having an introductory chat at the beginning, share some information about yourself – it will make your interviewee more willing to share their own personal experience if you are too. React to what your interviewee is saying rather than systematically moving through the questions: ask follow-up questions, engage with their stories. Have open and non-confrontational body language; the more you are relaxed, the more your interviewee will feel relaxed and comfortable in answering questions. Research your interviewee beforehand so that they feel like you are interested in them, and excited to engage with their story.
- **Make it clear that they are not required to answer every question.** When filling out a consent form, it should clearly state that they can withdraw their consent at any time and are not required to answer anything that they do not want to. When in the interview, pose questions in a non-confrontational manner using starters like, 'If you are comfortable with answering this…', and 'could you tell us about…' rather than imperative statements, such as 'tell us about'.

- **Do not ask questions that the interviewee is not comfortable with.** Even if you have sent the questions and your interviewee has responded that they are happy to answer, if they seem uncomfortable with answering during the interview, move on. They are not required to answer any of the questions, and if you push a question that they are not responding to, you will lose rapport and they will probably be less likely to share on the other questions in the interview.

If it is your own story you are recording:

- **Consider or even write answers to the questions before recording.** Formulating responses beforehand, no matter how vague (prompts or short sentences for example), will help you to avoid saying things that you are uncomfortable sharing. It also allows the recording and speech to flow more.

- **Do not answer questions that you are not comfortable answering.** As stated above, there is no obligation to answer questions if you do not want to. Sharing your story can involve whatever you think is necessary and is not required to be intimate. Equally you can add in questions and answers that you think should be included: the project is about sharing your own experiences and stories. Talk about whatever you think is relevant!

What if there is limited information about your interviewee?

Prior to conducting the interviews, it is important to carry out some background research into the interviewee's career, achievements and education. This will allow for the interview to be more tailored to the interviewee and thus produce a more insightful and detailed interview. However, the very nature of this work is to highlight women in STEM that often go unrecognized and therefore many of the interviewees will have little to no published information about themselves. The fixed questions in the toolkit hope to combat this by being appropriate for all participants but it must be acknowledged that there may be inconsistencies between testimonies due to some interviews being supported by more previous research. It is an aim that over time – as more stories are captured – that these inconsistencies will be reduced as more information on women in STEM is published.

13. USEFUL LINKS AND FURTHER READING

- Electrifying Women international website https://electrifyingwomen.org/international/

- INWES 'about' page https://www.inwes.org/about/

- Links to oral history guides:

  UK Oral history Society: Home - Oral History Society (ohs.org.uk)

US Oral History Association Oral History Association

- Samples of oral history records for scientists and engineers available here Category:Engineering and society - ETHW

For example
Oral-History:Yvonne Clark and Irene Sharpe - ETHW

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