THE FUTURE OF EDI IN STEM
FOR UNIVERSITY STUDENTS

A Case Study
by *Spread the Word* and the *Edinburgh University Women in STEM Society*

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SPREAD THE WORD

EUW in STEM
EDINBURGH UNIVERSITY
WOMEN IN STEM

ABOUT THIS REPORT

Dr Athina Frantzana (*Spread the Word*) and the Edinburgh University Women in STEM (EUWiSTEM) Society conducted an investigation into Science, Technology, Engineering and Mathematics (STEM) students' experiences of Equality, Diversity and Inclusion (EDI) at the University of Edinburgh.

The aim of this work was to explore students' awareness and knowledge of EDI issues in STEM and how the university is tackling these problems. We measured the effectiveness of the EUWiSTEM Mentoring Scheme, and other interventions of our pilot program, such as workshops and events, and what practices the university has in place to assist students belonging to minority groups.

This report describes our methodology, explains the findings from our research and outlines our recommendations needed for the University of Edinburgh to tackle EDI problems within the institution and better support students, and the next steps for *Spread the Word* and EUWiSTEM towards this goal.

MISSION, VISION, & GOALS

We are worried that the University so far has focused on projects that promote EDI for members of staff of the university, which is very important and definitely needs a lot of work. However, what is a university without its students? Students' needs, safety and education should be the number one priority of the university. Unfortunately, our findings do not support this statement. We investigated what University offers in general and more specifically online in terms of EDI education, advice and support, and the results were disappointing.

We ran and evaluated our pilot program, constituted by the Mentoring Scheme and a series of workshops, and we conducted an EDI in STEM UoE College of Science and Engineering-wide survey to understand students' awareness, needs, and experiences, as well as to gather feedback in order to set up the next steps of our strategy. Our results show that our pilot program was incredibly effective and left students wanting more.

We listened to the students and we realised how little the university, and relevant organisations, have done to raise awareness, promote EDI, and educate students on such matters. Students are confused as to who is responsible for EDI and where they could seek support and advice. Incidents of racism, sexism and other discriminatory behaviour happen every day around campuses, and nothing is done to eradicate them. Students have taken the heavy responsibility of this work, or the hard decision not to talk about it, and it's time the University upholds its responsibility to the welfare of its students.

With this report we want to show everyone, but especially the University, that by applying resources effectively we can have a much bigger impact than old-fashioned box-ticking activities and useless projects. We can bring together individuals with a real passion for EDI and desire for change and use our personal experiences, evidence-based practices, evaluation and expertise to have a lasting impact on students. We have established a successful pilot program with a few passionate individuals and zero funding.

We want to continue building upon our pilot program based on our findings and our constant research on the topic, and make sure that the University of Edinburgh students leave the university embracing diversity, respecting equality and promoting inclusion.

In order to achieve this, we need your help.

FOREWORD

by Dr Athina Frantzana - EDI in STEM Specialist-Researcher, *Spread the Word* Founder

Since I decided to conduct my PhD research on gender balance in STEM, I have dedicated my work and life to educating and promoting Equality, Diversity and Inclusion in STEM in order to achieve better studying and working experience for all. I am always grateful to Edinburgh University for giving me this opportunity, however this was also an opportunity for me to identify flaws in the University's EDI strategies and approach. After multiple barriers and fruitless efforts to share my passion and expertise in order to improve University's EDI status, I was disappointed and I decided after my graduation to keep my distance from academia and to focus on industry.

However, when in November 2019, Laetitia Dorlas (EUWiSTEM President 2019/20) approached me with her enthusiasm to make real change for STEM students and asked for my help, I could not say no.

"I want the University of Edinburgh to set an example and be a pioneer in educating students on EDI matters, creating inclusive and equal studying and working environment, and preparing a generation of scientists and professionals that celebrate diversity and advocate inclusion."

Working with EUWiSTEM committee and the student Reps gives me hope. We have built a fantastic program and our collaboration has been beyond ideal! The response and the positive feedback that we have received as a team, and also myself personally, and the impact that our effort seems to be having are my main drives in having offered my time and my expertise voluntarily and hoping that something much bigger will come out of this.

I want all the students to feel included and safe, to have equal opportunities, equally positive experiences and beautiful memories while studying at the University of Edinburgh (and any university, for that matter). I am sure that with the University's support, our program can lead the way and help achieve this goal sooner than later.

by Sarah Lappin - 2020/21 President of EUWiSTEM

I am a 4th year Computing Science and Artificial Intelligence student and the 2020/21 President of the Edinburgh University Women in STEM (EUWiSTEM) Society. I have now been part of the committee for 2 years, first as Informatics Representative then as Secretary, and have been involved in organising a variety of events, including the Un-Learn and De-Bias Workshop discussed in this report. As I begin the new academic year as the Women in STEM President, I want to do more to provide education on EDI issues and support for marginalised groups in STEM. As a mentee in the EUWiSTEM Mentoring Scheme, I know the value that this programme has and I want to see that same support extended to every student.

However, there is a limit to what we as a society can do in a single year. In recent years, there has been growing focus on getting women into STEM but we're not seeing the number of women in STEM higher education or the workforce increase fast enough.

Furthermore, when looking at EDI in STEM the focus is often solely on getting more women in STEM but other minorities in STEM are being left behind. I want to see the university include more BAME, LGBTQIA+ and disabled individuals when discussing EDI in STEM.

"At this moment, the university has an opportunity and a responsibility to take some meaningful and effective action to begin to resolve some of the EDI issues that are prevalent in the College."

I contributed to this report with the hope that it will be the catalyst needed for the College of Science and Engineering to take positive and effective action to address its EDI problems. I have largely been responsible for the distribution of our survey, and even in doing this, problematic attitudes towards EDI have been highlighted.

by Laetitia Dorlas - 2019/20 President of EUWiSTEM

I was the 2019-20 president of EUWiSTEM and am currently a final year MSc Chemistry student. Over the past year I have been leading a committee of 24 female STEM students in empowering our members by organizing weekly networking opportunities, skill development workshops, and other events.

In 2018, when I was the Social Secretary of EUWiSTEM, I co-founded the annual Hello World Hackathon and in 2019 I set up the EUWiSTEM mentoring scheme. I want everybody to feel secure, confident, and supported. This has driven me to create an inclusive community where anyone, and specifically women in STEM fields, can come together to meet others in similar positions to share resources and support and encourage each other.

I realise that these days there are many (flashy) initiatives and projects that promote EDI matters. Many might see it as just another trend to join in on. There are only very few initiatives however that truly make an impact and create lasting change.

"I wanted to make sure we are not just another society that talks about the issues we see. I want to drive real, positive and tangible change."

We do this by actively listening to our community and members, to act according to their needs, and most importantly: follow up. We actively tracked the progress of our mentoring scheme participants by sending out monthly surveys and composed a large survey on EDI awareness together with Dr Athina Frantzana at the end of the academic year.

Through the data we collected and this report I want to show the clear need for well-organized action in order to achieve real equality, diversity and inclusion.

EDI IN STEM

Recent events (1) brought once again into the world's attention the need of real Equality, Diversity and Inclusion (EDI). If only people were aware of how biases and stereotypes are promoted and how they negatively affect people's behaviours and lives, this world would have been a better place. History has shown that studying, researching, reflecting and educating is the only way to finding solutions to big problems. Staying ignorant and indifferent, repeating and perpetuating stereotypes and mistakes can only cause more problems.

The STEM world is no different. If anything, STEM has its own issues of underrepresentation, stereotypes and biases which lead to discriminatory behaviours and a non-inclusive environment, and consequently affect certain groups' retention and progress in these fields. For example, the issue of women's underrepresentation in STEM is not new (2). In fact some people are tired of hearing about this: "Women in STEM", "Women in Tech", and so on. But it is true; statistics (3) have been showing the constantly smaller numbers of women studying and working in STEM fields. Additionally, multiple initiatives and organisations are dedicated in bringing these numbers up and creating a gender balance. And a lot of studies (4) have tried to understand the reasons behind this underrepresentation.

Have things changed though? Apparently not.

> *"Being included and understood is hugely important for*
> *people of different backgrounds.*
> *There are so few women in STEM and women have to work*
> *so much harder than men to be recognised in the same field.*
> *Which is hugely depressing..*
> *I think a lot of men don't recognise this importance that*
> *an increase in female engagement in the sciences*
> *will blur the line of sex all together.*
> *The social aspect is especially important because it means*
> *men and women are more likely to understand each other*
> *and the sexism that both sex gets subjected too."*
> *– Male Mathematics UG Student*

Research (5) has shown that current EDI approaches, such as offering a one-off online Unconscious Bias training, quotas to artificially increase the number of women, women-only events, are not effective enough to tackle the root of the problem and cause real change. People who are not affected by this underrepresentation, at least in an obvious way, are still unaware of the issues, and most likely are part of the problem. Maybe if these people knew the advantages (6) of living and working in a diverse, equal and inclusive environment, they might make an effort to change. Indeed, there are studies (7) that have confirmed that more diverse teams can lead to higher performance and productivity, as well as higher profits and better products.

Of course the matter of equality and inclusion does not and should not concern only women. Diversity is not only about gender. However, very little has been done in STEM to create the sense of belonging for those who belong to minority groups or are marginalised by society, and these people still continue facing barriers and discrimination, which in many cases are so rooted into the system that they are considered "normal" and are not questioned.

Even though this matter is not new and it has been studied for a long time (especially for women in STEM), there is still not a "magic recipe" to create an inclusive environment and EDI practices and policies are only on an experimental level. Particularly little research and effort has been done on university students level. Most initiatives focus on either younger ages, when it is believed that the stereotypes and biases start to form, or in workplaces and later career stages.

However, if studying at the university is not the right place and time to question, advance your critical thinking, educate yourself and grow into the next generation of scientists and researchers on whom this world is counting, when and where is it?

For all these reasons we wish with our program to focus on all STEM students, and to put in practice and evaluate strategies that have been proved to be more effective, such as mentoring, raising awareness, and constantly educating. However we understand that in order for this program to reach maximum effect it needs to be supported from the University, and the University needs to commit and invest in it.
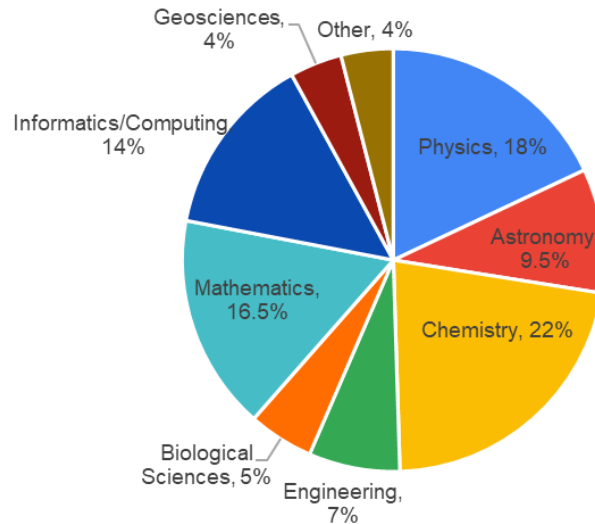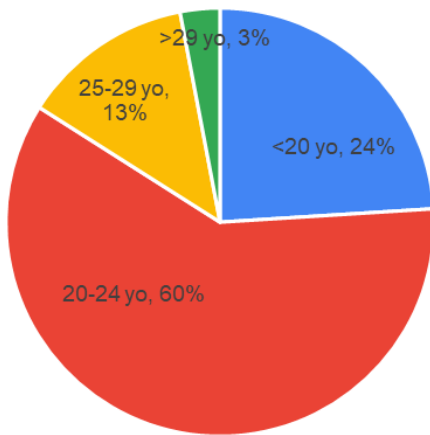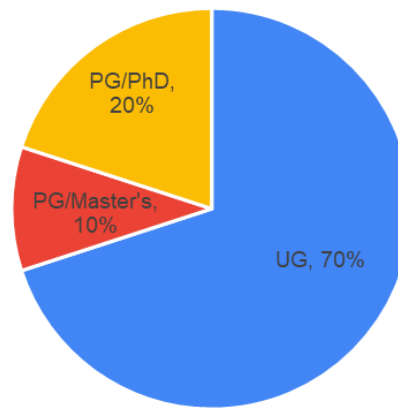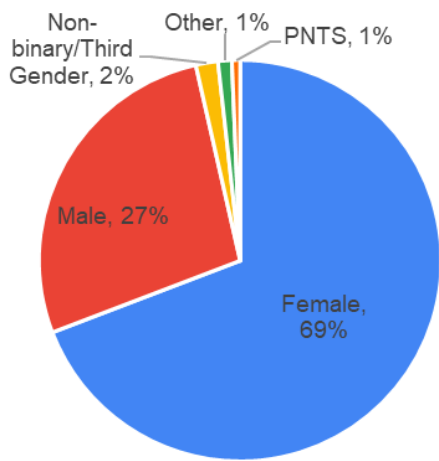
RESEARCH DESIGN AND RESULTS

EDI SURVEY

The survey was distributed and completed electronically using Google Forms during June 2020. It was advertised to undergraduate and postgraduate STEM students at the University of Edinburgh via the mailing lists of STEM related societies' and Schools within the College of Science and Engineering. The survey was sent to the School of Chemistry, School of GeoSciences, School of Informatics, School of Mathematics, and the School of Physics and Astronomy mailing lists. Additionally, the survey was advertised to the Engineering For Change Society, Programming Society, Edinburgh University Science Magazine (EU:Sci) and both Edinburgh University Women in STEM (EUWiSTEM) general and mentoring scheme mailing lists.

The data collected from this survey formed a large basis for our recommendations to the College of Science and Engineering, therefore it was important our data represented the population of the college as closely as possible. It was also important to include those who are not directly detrimentally affected by EDI matters (those who do not belong to a minority group) to allow us to assess their awareness and knowledge of EDI issues. Collecting data from students of different genders, nationalities, ethnicities and socioeconomic backgrounds allows us to assess the unique experience of each group and investigate the role of intersectionality within EDI.

We opened the survey for 25 days and received a total of 451 complete responses from Science, Technology, Engineering and Mathematics (STEM) students, whose self-identified gender, level of studies, age group, and discipline are shown in the graphs:

"I think it's great that you are gathering feedback about these important subjects!"
– Informatics UG Student

Gender distribution: Female, 69%; Male, 27%; Non-binary/Third Gender, 2%; Other, 1%; PNTS, 1%

Level of study: UG, 70%; PG/PhD, 20%; PG/Master's, 10%

Age distribution: <20 yo, 24%; 20-24 yo, 60%; 25-29 yo, 13%; >29 yo, 3%

Subject distribution: Physics, 18%; Astronomy, 9.5%; Chemistry, 22%; Engineering, 7%; Biological Sciences, 5%; Mathematics, 16.5%; Informatics/Computing, 14%; Geosciences, 4%; Other, 4%

The big response to the survey, the long answers to the questions and the positive comments, make it obvious that the students need to discuss and be heard regarding EDI matters, and that up until our attempt they hadn't been given the opportunity. This itself is evidence of how EDI has been treated at the University.

> "I would just like to apologise to whoever reviews these responses for how long and rambling mine are and to mention I filled this out only because it was the first time I have felt a university EDI survey was worth my time as it didn't exclude anyone who isn't in a minority group […]"
> – Astronomy UG Student

> "Relevant survey! Thank you!
> Would love to see more events in general (meaning the same workshop running twice and etc.) and more representation in mathematics.
> Thank you!"
> – Female Mathematics UG Student

EUWiSTEM EVENTS

The EUWiSTEM Society aims to promote gender equality, diversity and inclusivity across all STEM fields. They aim to achieve this by organizing three main types of events:

1. Workshops to improve specific hard and soft skills such as coding, networking, writing job applications, dealing with imposter syndrome etc.
2. Social networking events with fellow Edinburgh University students for members to create a network, share experiences, and give and receive support.
3. Networking events and inspirational talks with prospective employers and women in industry and academia.

The EUWiSTEM Society hosts weekly smaller-scale events as well as large-scale events such as the annual Hello World Hackathon, the Women in Tech Conference, and the Women in Charge Conference.

A full list of events hosted in the 2019/20 academic year (including summer 2020) are listed in Table 1.

To gather information on how the Edinburgh University Women in STEM Society can best support students at the University of Edinburgh, we posed several questions relating to EUWiSTEM events in the big EDI survey we conducted in June 2020. These questions were designed to gauge student engagement with the society, how EUWiSTEM events benefit them, and what events appeal to them. As the survey was open to all STEM students, regardless of gender, we expected many students would have had little interaction with the society. The answers to these questions can help the society to improve engagement and the awareness of EUWiSTEM.

The vast majority of respondents (78.5% of total respondents, 72% average of female students and 92% of male students) unfortunately did not attend any EUWiSTEM events in the 2019/20 academic year. The main reason for this could be that they were not advertised broadly enough to reach more students of all genders and schools, rather than mainly students who are actively looking for such events or are involved with EUWiSTEM in some way.

Workshops	Socials / Networking events with fellow students	Collaboration with industry or academia
HTML workshop with Code First: Girls & EUWIB	Fresher's Week Pubcrawl	Ada Lovelace Day networking event
Networking workshop	Meet the Committee Social	Brunch with Accenture
Hello World Hackathon	Internship Fair	Big Questions in Physics (x4)
Imposter Syndrome Workshop with Dr Athina Frantzana	Mentoring Scheme Launch Event with Dr. Athina Frantzana	BPuzzled with Bloomberg
Workshop on Gender Balance in STEM with Dr Athina Frantzana	Movie Night	EY Recruitment Talk
Women in STEM Connect: Un-Learn and De-Bias Workshop with Dr Athina Frantzana	Christmas Yoga	Bloomberg Brunch
Women in STEM Connect: Wikipedia Editathon and Workshop	Pub Quiz	Women in STEM Connect: Racism in Academia Panel with Edinburgh University African Carribean Society, the BlackEd Movement and the BAME Collective
	Pi Celebration Day with BakeSoc	Women in STEM Connect: Early Careers Panel
	Women in STEM Connect: Introduction and Networking Session	Women in STEM Connect: What Will the World Look Like Post-COVID?
	Virtual Story Swap with Hoppers	Women in STEM Connect: Exploring PhD Pathways

Opportunities to network with other women in STEM was mentioned as the top benefit from attending these events from the respondents to the respective question. Meeting women from other STEM fields was especially highlighted as a benefit by some. Other benefits included: motivation and inspiration by real role models, broadening knowledge and learning new skills (such as programming, mentoring, applying for jobs), EDI awareness, feeling included and sense of belonging, career opportunities.

Academic talks were voted as the kind of events that the majority of both female (70%) and male (64%) respondents were more interested in, with industry talks (54% and 42% respectively) and workshops (54% and 36% respectively) following very closely. Finally, some of the survey participants suggested that they would like to see more events with more senior academic and research staff or final year students to share experiences and get advice for the future, while some would be interested in more events related to EDI in STEM and collaborations with other societies, such as BAME and LGBTQ.

Throughout the academic year, EUWiSTEM also collected event-specific feedback. One of our largest annual events is *Hello World Hack* (HWH). HWH is a hackathon aimed at beginners, designed to give experience and insight into a career in technology. Although not exclusively for women, we especially encourage women to participate in all roles (hackers, mentors and staff) to develop their confidence. After *Hello World Hack 2020*, we collected feedback from participants, mentors and sponsor companies. The majority of the respondents found the event very well-well organised and the workshops interesting and engaging. 64% of participants said the hackathon improved or significantly improved their programming skills, and most of the participants said that they were definitely confident to attend another hackathon. These results further showcase the direct positive effect of EUWiSTEM events on students' confidence and skills.

"They helped me to feel included and know that I am not alone in the traditionally male dominated STEM field. They also let me learn more about topics which I didn't really know about."
– Female Mathematics UG Student

"They helped broaden my horizons, and shed light on the comparative difficulty women and other gender minorities face in pursuing careers and research opportunities in STEM."
– Male Mathematics UG Student

MENTORING SCHEME

The EUWiSTEM Society decided to launch their Women in STEM Mentoring Scheme in the autumn of 2019 after many members expressed their desire to mentor and/or be mentored. The broader aim of the Scheme was to equip female STEM students with greater confidence and direction in their degrees, careers and lives. This would be achieved by giving UG students the opportunity to receive personalised guidance from a more experienced PG student who could offer support and reflect on their own career journey.

The Mentorship Scheme Launch Event was organised in January of 2020, where Dr Frantzana ran an Introduction to Mentoring Workshop (see Workshops Section), followed by a networking session where all the participants had the chance to meet each other and potentially find a mentor/mentee before the matching process by the Scheme managers. The launch of our Mentoring Scheme was advertised along with an application form for both mentors and mentees via EUWiSTEM mailing list and social media channels, and through the mailing list of the various schools within the College of Science and Engineering as well as the Business School.

"I met a bunch of people during the mentorship open up session which has given me some insight into postgraduate life!"
– Female Informatics UG Student

A total of 102 students (mentors and mentees) participated in the Scheme. Those who didn't find their match during the Launch event (which was the vast majority of participants) were paired up with a mentor/mentee based on their responses to the sign-up form by the Scheme managers. Two check-in surveys (one after 4 weeks of initial pairing, the second after 8 weeks) were sent out to all participants in order to track the progress of the Scheme and its impact, and help participants actively evaluate their mentoring relationship. Appropriate actions were taken by the Scheme managers and Dr Frantzana to cover needs and requests by the mentors and mentees, where possible.

"A really fantastic initiative. I learnt a lot and hopefully passed on a few helpful tips as well.
[I] would definitely like to take part again."
– Female Chemistry PhD Student

Main findings from the two tracking surveys included:

- the majority of the pairs were meeting once a month and firstly mainly on in-person basis over coffee, and later due to the pandemic mainly via video-calls;
- the dominated discussion topics were around future career/studies plans, and personal development, networking and confidence building;
- the main benefits for the mentors were the sense of achievement and helping others, and self-reflection and confidence-building;
- the main benefits for the mentees were advice on studies/careers paths and opportunities, and guidance on specific skills (i.e. programming, time-management);
- the mentors' top expectation from this scheme was to have a positive impact on their mentee by sharing their experience/knowledge, and for the mentees was to receive guidance and advice on specific skill or generally on studies/careers;
- the majority of both mentors and mentees were satisfied with their matches, and there were only some comments asking for more guidance, more social events and communication.

In June 2020 when the academic term had ended we sent out an email to all participants to notify them of the end of the formal provision and tracking of the Mentoring Scheme. A final evaluation of the impact of the Scheme was included in the EDI survey, where it also received very good feedback through the responses to the related questions. On a scale from 1 to 5 (1=not at all, 5=extremely) on how useful the Scheme was, the participants gave an average of 3.7. The vast majority of the feedback was very positive highlighting that having or being a mentor is really helpful and an amazing experience, that it was very well organised, and other positive outcomes related to career and studies advice and skills development. The impact of the pandemic, that kept some of the relationships short or incomplete, was also mentioned by a few of the participants. Finally, the vast majority of the survey respondents (80%) said either that their school did not offer a mentoring scheme or that they did not know about it.

"My mentor was matched really well to me and she helped me a lot with various applications. I learnt a lot about her career which is useful as this is the field I hope to go into in future."
– Female Chemistry UG Student

WORKSHOPS
Mentoring Training Session

An introductory mentoring training session was offered by Dr Frantzana at the Mentoring Scheme Launch event in January 2020. The aim of this session was to prepare both mentors and mentees for their mentoring relationship by offering tips and advice on what to expect from it and how the whole process works.

Based on the feedback received in the first check-in survey a Mentoring Handbook created by Dr Frantzana was sent out to all mentors, offering them more guidance and support with their new mentoring experience, which then received very positive feedback.

"[The mentoring training session] helped me realise how to approach the mentorship scheme and how to be a better mentor."
– Female Bio Sciences PhD Student

"The workshop on mentoring helped to define the boundaries of the roles and focus on listening rather than giving explicit advice which was what I thought was part of mentoring."
– Female Physics PhD Student

Also, feedback on the mentoring scheme given through both the tracking surveys and the EDI survey showed that the training was really helpful and gave clear guidelines on how the mentoring relationship works. It was often, though, mentioned that repeating the intro session and running other more specific sessions, as well as more support by the Scheme managers and better advertising would be useful.

"It gave clear guidelines for the mentors and mentees and gave everyone a good idea of what to expect throughout the mentorship."
– Female Bio Sciences UG Student

Workshop Series

In order to raise awareness and start a conversation on EDI matters Dr Frantzana offered her time and expertise to build the society's pilot program and delivered two related workshops: Gender Balance in STEM and Un-Learn & De-Bias (online). She also offered a workshop on the very "hot" topic of Imposter Syndrome, aiming to help STEM students, mainly female, to boost their self-confidence and overcome their imposter feelings, which are usually related to gender stereotypes in STEM .

All workshops were well attended and received fantastic feedback. According to the responses on the respective survey question, the respondents who had participated in the workshops found them (excl. UB workshop, which was delivered after the survey was conducted) very useful with an average 4.2 on a scale from 1 to 5 (1=not at all useful, 5=extremely useful). The UB workshop received an average 4.1, according to the workshop feedback form responses.

About 90% of the survey respondents also think that having available such workshops and events (and other relevant) throughout the academic year would help improve the EDI awareness and status of the students and the University. However, a few of them expressed their concern on better advertising and making attractive such initiatives in order to reach all the students, and especially those who tend not to be interested in EDI topics, for example male students.

"I think it's valuable these workshops exist, even if they don't often apply to me. For me it helped to become more aware of issues impacting other fellow students."
– Male Informatics UG Student

"I think [running these workshops and other similar] throughout the year is a good idea, but a better idea could be to have them as mandatory classes in the same way you have an introduction to anything else, to really cement the message, also I had no clue they existed in the first place."
– Male Geosciences Master's Student

1 Managing Imposter Syndrome

The aim of this workshop is to raise awareness on the important topic of Imposter Syndrome, which is very common in academia and STEM, especially to women, and equip the attendees with tools to manage their imposter feelings and boost their self-confidence.

In this interactive workshop in February 2020, we discussed the causes, the symptoms and the consequences of Imposter Syndrome (IS). The attendees had the opportunity to self-identify their level and type of IS, and to discuss strategies to dealing with it through a variety of tests, tasks and group activities. Because of the nature of this workshop, the number of attendees was limited to a maximum of 25. It was very well attended and received excellent feedback.

> "I attended the Imposter Syndrome Workshop and there was a lot that I didn't know about it which was useful to learn.
> The various questionnaires to help me learn about how much imposter syndrome was affecting me was interesting.
> The discussion about it with others also made me understand how much it affected so many women in STEM to varying degrees."
> – Female Informatics UG Student

2 Gender Balance in STEM

This workshop aims to trigger more and better conversation on the crucial issue of representation and the experiences of women in the male-dominated STEM fields. It clarifies the reasons why gender balance and more diversity are needed in STEM, and it informs on the ways this can be achieved and sustained.

In this workshop in March 2020, we discussed the whats and whys of the lack of gender balance in STEM, and we focused a lot on how we can change it. The attendees explored their personal Gender Bias and Unconscious Bias, and we attempted to identify current effective initiatives, through a variety of tasks and group activities.

Finally, we briefly discussed intersectionality and men's role in the effort to achieve EDI in STEM. Similarly to the previous workshop, there was a maximum of 25 attendees for better engagement and effect. This workshop was impacted by the pandemic and it had fewer attendees. However, the discussion was vivid and insightful, and the workshop received fantastic feedback.

"I really enjoyed the Gender Balance in STEM as I feel it's very important to have more discussions on these topics in groups. The university doesn't really provide this kind of setting and platforms and I feel like so many useful things come out of good discussions."
– Female Chemistry UG Student

3 Un-Learn & De-Bias

The aim of this workshop is to understand what Unconscious Bias (UB) is, how it affects our thoughts and behaviours, identify ours and others' biases and ways to deal with them. This workshop provides a variety of resources and activities related to UB, and all the attendees are asked to take the Implicit Association Test (IAT) (the most popular tool to identify UB) prior to the workshop.

This workshop in August 2020 included a brief introduction to Unconscious Bias, a discussion on the effectiveness of current UB interventions and of the IAT , ways to identify biases and deal with discriminatory behaviours, and strategies to work on overcoming personal biases. The attendees had the chance to reflect on their test results and discuss their experiences.

This workshop took place online and as such it was open to the general public, not only to Edinburgh University STEM students; however, the majority of the attendees were UoE STEM students as it was mainly advertised on the EUWiSTEM platforms. As with the previous workshops, this workshop received great response and very good feedback.

"Eye-opening"

"Thought-provoking"

"Insightful"

"Needed"

EDI IN EDI UNIVERSITY

If the University of Edinburgh wishes to have and retain a large diversity of students, it is the University's responsibility to make sure that all students feel included and safe and enjoy their time during their studies. In our case here, we are not looking at numbers, we are looking at inclusion and equality. It does not matter much if the Engineering School has 3% more female students than last year if these students join an environment which is not welcoming, does not provide them a sense of belonging or the confidence needed to succeed in their field of studies.

Minority Groups and Discrimination

Through our survey, we asked the participants to tell us if they think that they belong to a minority group. The reason we expressed the question in this way was mainly because we did not want to bias their thoughts and responses, and we wished to let the respondents express themselves and give us more insight on how they feel. Table 2 shows the minority groups formed from the responses by those who think that they do or might belong to a minority group. For example, some female students do not think that women in STEM subjects form a minority group.

> 53% of the respondents do not think that they belong to a minority group.

The three top minority groups are: Race, Gender, Sexuality. Interestingly, Race and Sexuality are as significant as Gender overall, even though Gender has attracted most of the interest of EDI initiatives and policies. However, if you are a female student in STEM, the minority group you are most likely to primarily fall into is related to your gender.

Disclaimer: Where there is a comparison between male and female, it does not promote or support Gender Binary by any way; there were very few responses by non-binary/third gender and "Other" to draw conclusions by comparison. We did take all the responses into consideration in non-comparative analysis.

Another interesting -yet ignored by most EDI initiatives- group is the one that is formed from a combination of two or more minority groups that a person belongs to (intersectionality), which concerns far more female than male students. Finally, we were surprised to find out that even though very few, there were still students who consider "class" and economic background as minority groups. Age and caring responsibilities, which are groups that also suffer from lack of support from the University, were mentioned too.

TABLE 2: MINORITY GROUPS

	LGBTQ+/ SEXUALITY	RACE/ ETHNICITY	GENDER	DISABILITY*	RELIGION	NATIONALITY	OTHER**	INTERSECTIONS***
FEMALE	42	48	65	11	7	9	6	34
MALE	17	12	0	3	1	5	2	3
TOTAL	62	66	65	16	8	13	8	41

Includes: Physical, Mental, Neurodiversity
**Includes: Age, Caring responsibilities, Class, Economic background*
*** Combination of two or more groups (i.e. gender and race)*

We also asked the students if they had ever felt discriminated against within the University premises, and it was a pleasure that 83% of the students responded "No" to this question. However, there is still 12% of students (44 female and 10 male) that stated a clear "Yes" to this question, and the rest were not sure or mentioned "microaggressions" and other comments.

Here are some of the explanations that some of the students gave for their response to this question (*you can find all the responses to this question in the extended version of the report*):

> "I've been told celebrations of events from minority culture aren't "real", I've been corrected on my own partners pronouns and repeatedly argued that "they/them" is not acceptable for pronouns.
> Celebration of Pride month at the University is highly hypocritical given present actions towards Trans individuals."
> – Male Informatics PhD Student
>
> "Experienced homophobia in classes. Also the amount of sexism that isn't obvious but just been assumed to be inferior / less smart / less capable than male peers; it's exhausting.
> Witnessed transphobic statements being said by senior academics and they just get away with it under the pretence of free speech."
> – Female Physics UG Student
>
> "As a white male in Informatics, I very much fit in with the crowd."
> – Male Informatics PhD Student

"I have had men re-do experiments I have taken part in because they don't trust in a woman's capability, and I have been ignored when reporting faulty equipment, where my male peers have been listened to immediately."
– Female Astronomy UG Student

"I have experienced many microaggressions at university. From the offset, when I attended the open day for UofE I approached the Informatics stand and was asked if I would rather do design informatics. In a tutorial I was the only woman and the tutor always asked only me if I understood the questions."
– Female Informatics UG Student

"Nothing to do with race, but about class divisions which do definitely still exist in the UK, and are against those from poor families,
it's practically impossible to fit in.
Also very isolating when there is no one from a similar background around."
– Female Chemistry PhD Student

"The only time I have felt uncomfortable, is in regards to talking about mental health with members of the university staff. I have mental health issues and that means there is an element of misunderstanding and sometimes feeling like the university should do more to help people like me.
The system for dealing with mental health within the University is flawed and can often appear daunting to those with mental illnesses."
– Female Astronomy UG Student

EDI Awareness and Education

In our EDI survey we also asked questions to help us understand how aware of EDI matters the students are and how much their related needs are covered by the University. Our findings are of great significance as once again they show how little has been done by the University to raise awareness, educate the students on EDI matters, and create a prepared inclusive environment for everyone who joins the University.

"I'm generally aware that the university, and academia in general, have a problem with inclusiveness and diversity. However given my relatively privileged background, I've never been forced to truly confront this, and I think this lack of direct experience has influenced my awareness of EDI matters. I'm also not very aware of any EDI schemes at the university or student level."
– Male Physics UG Student

According to the students' responses to the respective questions, we found that:

- 83% of the students do not know who to contact at the University if they have to deal with an EDI related issue (such as sexism, racism…).

- The most common answer from those who stated that they know who to contact in case of an EDI issue was "Personal Tutor". Much fewer students replied with "EDI Officer" (very few students gave the name of the current EDI Officer of their School as an answer) and "EUSA" (Edinburgh University Students' Association) or "Advice Place".

- However, more than 92% of the students do not know if their school has an EDI officer, and almost half of the few respondents that know that their School has an EDI Officer are not sure what the Officer's job is.

- About 82% of the students have not received an EDI and/or UB training provided by the University of Edinburgh, and those who had received some such training found it useful (3.1 average on a 1-5 scale, 1=not at all, 5=extremely).

- Both female and male students do not feel very aware of EDI matters giving themselves a 2.7 average on a 1-5 scale (1=not at all aware, 5=extremely aware). They do not think that their peers are very aware of EDI matters either (2.5 average from female respondents and 2.8 from male respondents).

- The feeling of EDI awareness seems to be increasing with the level of studies, with UG students having an average 2.7, Master's students 2.9 and PhD students 3. Similar picture presents the awareness of their peers with UG students giving them 2.5, Master's students 2.7 and PhD students 2.8.

- There is also a small difference between how aware people who have received relevant training feel (3.1) and people who haven't received any training (2.7).

- On average the respondents of the survey believe that being educated on EDI matters is very important (4.3 on a 1-5 scale, 1=not at all, 5=extremely). Female students think of it as more important (4.4) than male students (3.9). Again there is a slight increase of how important EDI education is according to students with their level of studies (UG 4.2, Master's 4.3, PhD 4.4).

A variety of comments were given by the students regarding their awareness on EDI matters. Many highlighted that their awareness comes from their personal experiences or self-education rather than from the university's actions on this matter, while many stated that they don't feel aware enough either because they do not fall into an affected group or they did not have or were not given the chance to be educated on EDI matters. Responses against current EDI awareness initiatives were also present.

Here are some of the students' comments (*you can find all the responses to this question in the extended version of the report*):

"I feel that there are matters which need to be addressed but
I have no idea whom to talk to and which resources are available
by my academic department.
I'm also scared that it'll affect my academic standing if I speak out."
– Female Engineering UG Student

"I know there are frequently workshops, but a lot of them, such as Athena Swan,
seem only to be advertised to women, so I have stopped paying much attention
to the workshops when they pop up in my emails."
– Male Informatics PhD Student

"I'm aware because I educate myself, not because the university teaches us.
There's a lot of sexism (sexist comments to female engineer profs) and racism that
goes on without consequences in mech[anical] eng[ineering].
There should be a mandatory short course or something during matriculation so
people can understand slightly better how to treat others equally and kindly."
– Female Engineering UG Student

"I have felt very alone, isolated and ill-informed for the entire time
I have been here, but have been too busy and stressed to research it."
– Female Chemistry PhD Student

"I generally feel quite nervous about attending extra-curricular events at the
university, and especially if events are for specific groups, for example
LGBT, BAME or WiSTEM I think even if the event is specifically open to all,
I wouldn't want to accidentally upset or offend anyone by attending."
– Male Chemistry UG Student

"Honestly, I often ignore emails/pamphlets/etc. related to equality, diversion and
inclusion because I feel like these kinds of issues are being talked about nonstop
but they still continue to be a problem everywhere I go.
Personally, I just try hard to show respect and kindness to anyone that's around me,
and try to reflect on the times that I fail to do so in order to better myself."
– Male Mathematics UG Student

Insightful comments were also given by the students regarding the EDI awareness of their peers with a lot of students wishing their peers (especially white and male) to be more educated and sensitive on such matters:

"It really varies - the people who need to be aware are those with more privilege, and I think a lot of them are not very aware. this is why it is important to incorporate things into the curriculum, not just optional events […]"
– Female Informatics Master's Student

"My school is predominantly white, male, cisgender and British.
I have had to educate faculty on EDI issues in the past, including on appropriate language use.
Other PhD students have used sexist, racist, homophobic and transphobic language in my vicinity, aimed at both myself and other colleagues, and the school did very little to address these."
– Male Physics PhD Student

"In my degree here, I have pushed my peers to think and talk about race, which most are uncomfortable doing, as they don't understand the history and do not have to deal with on a day-to-day basis.
They often push back, and it is exhausting to constantly correct them and then try to educate them."
– Female Physics Master's Student

"I have a lot of discussions with my female friends on the topic but I feel that many female students at the university in general don't think the issue still exists and especially my male friends and peers seem to think there's no issue and have even told me that societies such as "women in xxx" are sexist towards men."
– Female Chemistry UG Student

189 students wrote their thoughts on why it is important to be educated on EDI matters. There was a variety of opinions with the majority believing that education on EDI matters is the only way or the best first step to understand the issues underrepresented and minority groups face in STEM and society in general and take action to remove the barriers, celebrate diversity and embrace inclusion. You can find all the responses to this question to the extended version of this report.

Here is a sample of the students' responses on the importance of EDI Education:

"Everyone has bias and our actions affect people around us
even if we aren't aware of it. If we are educated on such matters at this age
it will have a big effect when we are in positions of power in the future."
– Female Chemistry UG Student

"Everyone should be educated on EDI matters as this should be carried out
across campus and encouraged in all of students' aspects of life."
– Female Mathematics UG Student

"Without understanding the issues it is not possible for anyone to change
and improve their practice to be more inclusive.
When people have the belief that EDI is not their problem,
because they are in a large social group, no change can occur and
minority and oppressed groups will be left out."
– Male Chemistry UG Student

"..Education on EDI can enable people to move beyond vague aspirations of
improving diversity, towards taking concrete steps
to address actual barriers to inclusion."
– Male Mathematics Master's Student

"It's important that minority groups don't have to shoulder
the burden of being the only groups educated on this
and the only groups speaking on these topics."
- Non-binary/third gender Astronomy PhD Student

"It should be a compulsory thing in education to be taught about
inclusion and diversity, if large amounts of students are going to spend
5+ years around each other they should be educated to
recognise their own bias and how it affects their interactions.
It is also highly important that the teaching staff are educated in this way
as that is where I have felt the most friction during my studies."
– Female Astronomy UG Student

"If you do not educate yourself then you are part of the problem.
EDI should be taken very seriously."
– Female Chemistry UG Student

"No Such Page"

An investigation* on what the University actually offers to STEM (and all) students in terms of EDI education and matters was also carried out by Dr Frantzana. More specifically, she looked at what relevant resources and contacts are available on the websites of all the STEM Schools of the University, as well as more broadly what relevant training and support is offered by the University regarding EDI.

A first look at the websites of the College of Science and Engineering (CSE) and of the Schools that the College includes shows that CSE, School of Maths, School of Informatics and Bayes Centre do not have an EDI section available online, or it is exclusive for staff, or/and Athena SWAN** related. School of Informatics has a recently added section on Black Lives Matter, though. The rest of the Schools (Biological Sciences, Chemistry, Engineering, Geosciences, Physics & Astronomy, and EPCC) seem to have an EDI section available either on their homepage or somewhere in their website; again not specifically made for students. Generally, the focus seems to be on the EDI matters of staff, rather than the students. The School of Physics and Astronomy seems to have the most informed page, but from feedback we received from the students it does not seem to be enough.

A closer look at the actual EDI sections of the schools' websites revealed how neglected EDI has been by the University. More than 25 links provided on most of these websites lead to pages that do not exist. These pages, that open with the message *"No such page"* on the top, are related to a variety of EDI aspects: from EDI training to disability policies and childcare services. Most of the other links lead to either the main EDI website of the University, which has an overwhelming amount of general information and long documents on the various EDI matters, or to its subpage "Respect", where there are also some "dead" links. There is only one page on EDI training which is specifically for students, and it offers a 10-minute online training module on avoiding Unconscious Bias; if only it was that easy!

There is some good material that promotes and celebrates diversity at the University, but it is not obvious and not well presented. One has to really look for something specific to eventually find it; or not. For example, the "Celebrating our Diversity at University of Edinburgh" video***, published in 2015, has fewer than 1000 views!

It is obvious that there is no clear guideline on what all Schools and Colleges should do in order to achieve better EDI for students. Even the information for staff in many cases is not updated or it is difficult to find. Some of the STEM EDI committees and officers seem to have regular meetings, but a quick look at some of the available online meeting minutes and actions show that there is not much progress over time, and usually the focus of the meetings is on staff, statistics, and Athena SWAN awards. Even though a description on the role of the officers and the committees is available somewhere on the University's website, it is unsure if this role is met and if this is enough to create an inclusive, equal and safe study environment for all the students.

*First checked in June 2020. Last checked in September 2020
** https://www.ecu.ac.uk/equality-charters/athena-swan/
*** Watch it here: https://youtu.be/bjZmF-xPFo8

CONCLUSIONS

When we decided to organise this pilot program, we already knew that it was something STEM students -especially female and of other minority/underrepresented groups- needed. However, this research was eye-opening and made it clear that such a program is a necessity for all STEM students in order to achieve an inclusive study and work environment, which could lead to a better diversity and representation of all groups in STEM fields. It is much more serious and concerning than we -and obviously the University- have thought.

> "I'm really happy this survey is happening and I hope it creates some change at the university. Less than 1% of academic staff in the UK are black.
> I've never had a black lecturer/tutor/professor in four years at Edinburgh.
> I haven't seen a black person in the School of Mathematics in Edinburgh.
> I would love to see some mandatory events in the School of Maths educating people in EDI issues and for the university to look at its hiring policy and gender/race pay gaps."
> – Male Mathematics UG Student

The way the students embraced the Mentoring Scheme and the impact the Scheme had, despite the impact of the pandemic, shows us how much more effective it can be if it is offered to all students on a permanent basis and in a more extensive form with a higher number of training sessions, more resources, better management, of course with support from the University.

We know what we need to do, we now need help to do it better.

Similarly, the workshops and the events received fantastic feedback and seem to have had a great impact on those attended. However, a lot of survey respondents mentioned that they were unaware of this program -the scheme and the workshops- either because it was not advertised enough or it was advertised only on social media or within the society, so it was almost impossible to reach male students or students who do not have a direct interest in these matters. The concern on how to make the workshops and events more attractive to all students, especially male who tend to not be as interested in such initiatives, was also expressed by some of the survey respondents. To do so, the scale of the program needs to increase and to receive full support and commitment from the University.

"The people who are aware of EDI would be the only ones attending the workshops and the people who needed better education on such issues would be unlikely to take the initiative to attend."
– Non-binary/third gender Informatics PhD Student

"Yes [having available such workshops and events (and other related)
throughout the academic year would help improve
the EDI awareness and status of the students and the University]--
but I think it has to be better advertised
(because I was unaware of any of these)"
– Female Physics PhD Student

"I haven't taken part in EUWiSTEM events because I'm not a woman,
but a gender minority in tech. The name didn't feel inclusive to me,
as non-binary and trans men are not explicitly included,
so I wasn't sure if it was a space for me."
– Non-binary/third gender Informatics Master's Student

Through our research it was also made obvious how little the University offers in terms of EDI education and support to students, especially undergraduates and of underrepresented groups. The University should not expect from students to solve issues that shouldn't exist in the first place. Societies and movements are always important for students, but they shouldn't be responsible to deal with serious EDI matters and struggle to find their voice in the University. Neither appointing an academic as an EDI Officer can solve such issues. And it is obvious. Allies and volunteers are hugely needed and appreciated, but it's not their job to create and manage EDI programs that are big enough to be effective.

Webpages that do not exist, 10-minute online training, focus on staff and numbers, words and not actions, are not enough. The same applies to other organisations and initiatives which are founded and funded to do this job and fail by using the wrong approach. Awards, targeted scholarships, women empowerment events are good to have, but they do not educate the people that need to understand the issues and help tackle the barriers for real change to happen; they do not prepare the next STEM generation to create a more inclusive world where everyone receives equal respect and opportunities.

"I can't help but feel sceptical about this - I hope that when you hold events, you allow room for discussion.
Do not resort to the strategy of social pressure and guilt tripping that so much university activism is centered around."
– Female Mathematics UG student

"Yeah there needs to be more outreach to not just women but also to people who are not women (like sensitivity training).
The online 'training' sessions are worthless and do not fix any problem.
They just look good to do, but are not effective.
There needs to be regular, engaging, required sensitivity training:)"
– Female Physics PhD Student

We listened to the students, we used our experiences and expertise, and we came up with our next steps for the new academic year and the future, our recommendations to the University and the students, and a call to action to everyone who understands the gravity of the situation and wants to support our effort.

FUTURE WORK
RECOMMENDATIONS TO UNIVERSITY

Based on the findings of our research and our personal experiences as current and former University of Edinburgh students, we have compiled a list of recommended actions that the University should take in order to support our program and to achieve better EDI for STEM (and all) students:

- Put more focus on EDI for students (especially where underrepresentation of certain groups is an ongoing issue, i.e. women in STEM) and invest in evidence-based, innovative practices.

- Support our program with funding and advertising.

- Re-evaluate and make clear the position and responsibilities of EDI officers and Reps.

- Provide clear guidelines to students on where to find and who to contact for advice and support regarding EDI matters in the University; create an appropriate position, if needed.

- Create a safe, easy and accessible way for students to report incidents, and clear follow-up procedures.

- Update and better promote web pages and resources related to EDI in the University to all students, not only those affected.

- Listen to the students' feedback and needs by conducting regular surveys and evaluating current interventions.

- Share good practice and knowledge with other Universities.

EUWiSTEM FUTURE PLANS

From the responses, we understand those who attended EUWiSTEM events appreciated the variety of events offered. We will continue to hold a mixture of networking, social, industry, and academic events to meet the needs of our members.

Moving forward, EUWiSTEM will also be making some adjustments in response to the feedback:

- To consolidate our marketing techniques, we will ensure every subject representative has a defined, relevant point of contact within their school, with whom they can share information regarding our events to be advertised to students.

- We will be running regular, inclusive 'coffee morning' socials to provide further opportunities for students to connect in an informal setting. Additionally, after several suggestions of group-specific socials, we will ensure some of these are targeted at specific students (e.g. postgraduates, women of colour).

- As a society, we will aim to collaborate with more (academic and non-academic) societies to expand our network, raise further awareness of our society and diversify event topics.

- We will soon be launching a blog to allow us to showcase more women in STEM and provide a platform for students, academics and industry to share their advice and experiences.

- After several comments on the impact of beginner friendly workshops, such as the introduction to programming, we plan on hosting a wider variety of skills workshops to allow students to gain skills required in industry.

Due to the positive response we received regarding the mentoring scheme and workshop series, we plan to expand the mentoring scheme and accompanying workshops. We intend to add more workshops and hold these on multiple dates to increase engagement.

Other possible future expansion areas for the Scheme include:

- Include industry professionals as mentors, allowing both undergraduate and postgraduate students to be mentees.

- Open the scheme up for all STEM students at the University of Edinburgh, regardless of gender, and provide further clarity on the inclusion of male and third gender/non-binary students.

- In the matching process, add additional demographic-based questions to allow mentees to express what characteristics are important to them in a mentor.

CALL TO ACTION FOR STUDENTS AND SOCIETIES

Although the university is responsible for educating students on EDI matters, the role of societies in tackling EDI issues within the University is still important.

We encourage all societies to:

- Host events and share resources which highlight EDI matters in relation to the society's subject matter and beyond.

- Collaborate with other societies that focus on the representation of marginalised and underrepresented groups.

Students, especially those not from underrepresented groups, must not become complacent when it comes to EDI matters.

To create a welcoming and safe environment where all students can thrive, students should:

- Actively engage with EDI programs and training when provided.

- Hold the university accountable for the success and implementation of EDI programs and schemes.

- Express interest in our program to your schools via class and school representatives.

We will be sharing more information regarding our 2020/21 program and how students can get involved with all schools in the College of Science and Engineering. Students can also stay updated on the program via the EUWiSTEM mailing list and social media channels (see www.euwistem.com for more information).

SPREAD THE WORD FUTURE PLANS

Dr Athina Frantzana and *Spread the Word* are planning to continue supporting and collaborating with EUWiSTEM, and working tirelessly towards achieving their common goal: better EDI education, awareness and conditions for STEM University students.

More specifically, Dr Frantzana:

- Continues working with EUWiSTEM on building an improved and more extensive EDI in STEM program, and securing funding and/or sponsorships in order to deliver this program and achieve its maximum effect;

- Has created a draft schedule for the workshops and training sessions that she is planning to deliver in 2020-2021 academic year for this program;

- Has designed material and resources specifically for this program and the students;

- Is planning to build bridges with all the EDI Officers and Reps of STEM Schools of the University to design a collaborative plan of action, and discuss tailored strategies for each school;

- Is planning to liaise with other student societies and groups that support and promote EDI in any form, in order to create a more holistic, sustainable, and inclusive program that covers all aspects of EDI and students' needs.

More information on *Spread the Word* and Dr Frantzana's work can be found here: https://spreadthewordstem.co.uk/about/

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Let's do this together.

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