



**The Engineers Without Borders International Global Forum
The Formation of Engineers: A Global Issue
24-25 August 2017, London, UK**

Overview

This year's Global Forum was all about the development of engineers and what we, as the Engineers Without Borders movement, are doing about it. There were 48 individuals from 18 different countries¹ who ensured that we had a rich, varied and global discussion about how to ensure that engineers are global in their mind-set and reach.

The conference was focused on the importance of working collaboratively and there were numerous opportunities for open discussion amongst individuals and groups, including during the evening activities and refreshment breaks. Through a facilitator, individuals representing Engineers Without Borders organisations from across Europe, Africa, Latin America, North America and Asia spoke about the issues which impact them and collaborated to identify potential solutions. Throughout the two days, individuals were given sufficient time and space to discuss the topics linked to the event title 'The Formation of Engineers: A Global Issue', that they felt passionately about. With the aid of a visual communicator, together we created graphical records of the discussions that took place over the two days.

¹ Engineers Without Borders organisations from Argentina, Australia, Canada, Chile, Denmark, Finland, France, Honduras, Hong Kong, Kosovo, Macedonia, New Zealand, Norway, Rwanda, South Africa, Sweden, UK and USA were represented as well as attendees from the Royal Academy of Engineering and Share Water.

Over two days, EWB members were able to discuss a range of topics. These included but were not limited to:

- How to engage working professionals in student/ professional mixed groups?
- How to build capacity in developing countries and how to support local EWBs.
- The role of funding
- The potential for an international design challenge.
- What is an engineer? Could we all become engineers?
- Peace engineering - how can engineering facilitate peace?
- How do we work together without continuing the developed/ developing power dynamics?
- Chapter management
- The potential for new EWB- I projects involving multi country EWBs.
- Sustainable growth
- Cultivating learning amongst EWBs.
- Gender equality and diversity in engineering.

There was a general consensus, and a lot of generated excitement, that Engineers Without Borders-International has an important role to play in bringing the national groups together. It was recognised that our strength as a movement lies in the variety of the different organisational structures, projects and approaches that we encompass.

There were some tangible ideas that were identified that, with support, could be implemented in the near future to continue to bring the community together and grow the movement so that the movement could make a tangible difference in moving forward engineering education to better prepare engineers to face the many challenges, outside of the technical, facing the world in the future.

Method

The broad nature of the topic 'The Formation of Engineers' ensured that there were varied discussions from the broad to more specific. The method used by our facilitator, Anne Bennett, was designed to allow attendees to share stories, problems and solutions within small groups. On the first day, after a networking lunch and registration, the Global Forum was opened with a panel discussion featuring Wiebke Toussaint of Engineers Without Borders South Africa, Bernard Amadei from the University of Colorado, David Lakin from the Institution of Engineering and Technology (the IET) and Shane McHugh and Andrew Clark from the Royal Academy of Engineering. Focused on the Formation of Global Engineers, the panel discussed the global importance of engineering and the issues associated with the formation of engineers. Throughout this time, Zuhura Plummer, a visual facilitator captured what was being discussed and produced a graphic recording

Following the panel discussion, all attendees were invited to create the content of the Global Forum for the next 36 hours. Attendees assembled into groups to discuss and brainstorm the factors which they felt created globally minded engineers. Each group was given the opportunity to feedback on their discussion which was graphically recorded and summarised as a foundation for discussions to begin the following day (see images 8 and 9). In the evening, conversations and relationships continued to be built with a dinner in Covent Garden.

On the second day, Anne Bennett continued to encourage collaboration and participant led discussion as attendees were invited to lead on discussions (problems, theoretical issues, educational challenges) linked to the Global Forum. This open, broad approach ensured that conversation flowed and partnerships were established. Everyone at the Global Forum was able to raise a topic or idea that they wished to discuss, ask difficult question, or highlight an important discussion topic. Participants were encouraged to join any discussion, voice an opinion and share comments. At the end of each discussion, the group was required to write up what they discussed and provide specific commitments. A typed version of this is included in the appendix of this document. These 30 discussions (split across 5 parallel sessions during the day) were presented periodically throughout the day. The Visual Facilitator brought the group together to reflect on what

she had captured from the discussions. The Global Forum closed with a 'Talking Stick' session where each individual reflected on their experience over the past two days and made commitments for the future.

Photos from the event



Image 1: Creating global networks and communities with representatives from EWB in Hong Kong, Australia, Honduras and Argentina.



Image 2: Discussions during the Global Forum



Image 3: Discussions around the formation of an engineer



Image 4: Our venue at the Royal Society of Arts with our facilitator Anne Bennett



Image 5: Close of the Forum with reflections, thoughts and actions.



Image 6: Attendees for the Global Forum from 18 different countries

A visual reflection of the discussions by Zuhura Plummer



Image 7: Visual reflection of discussions from the panel



Image 8: Overview of opening panel discussion

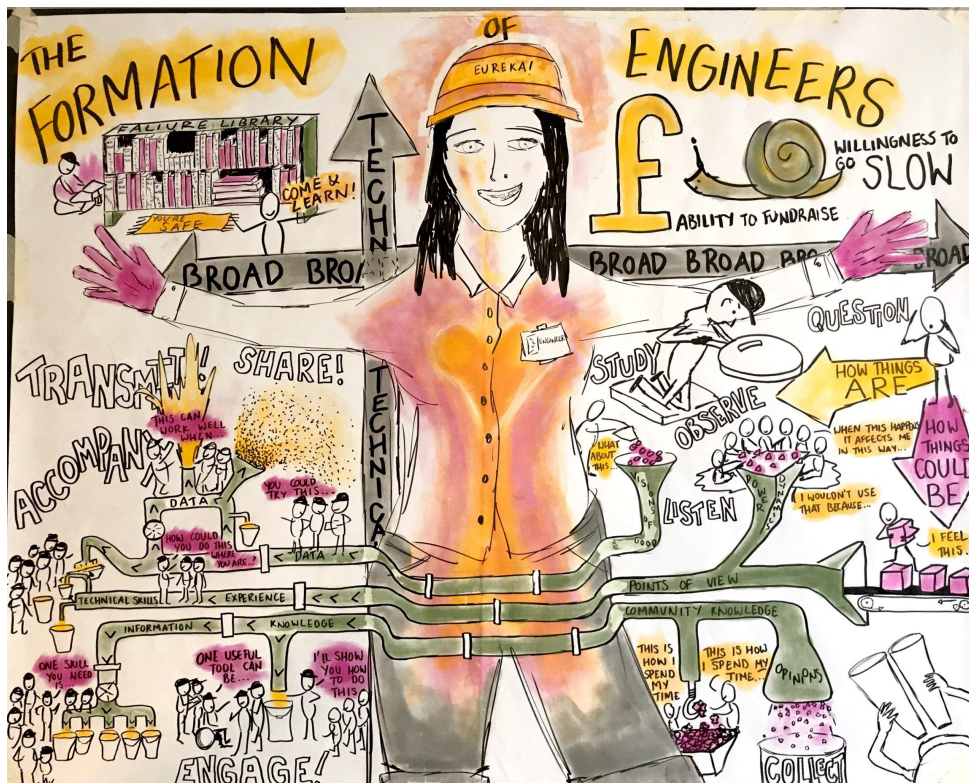


Image 9: The formation of engineers

Opportunities:

There was a broad discussion about some of the most pressing issues with a general consensus that Engineers Without Border-International could play a more active role in bringing the national groups together. It was recognised that our strength as a movement lies in the variety of the different organisational structures, projects and approaches that we encompass. There was a general commitment to upholding our unique and varied nature by not uniforming the national Engineers Without Borders organisations but instead pursuing a path of 'critical friendship' whereby we all learn from one another and can chose to adopt new practices as a result.

There were also some recurring themes or ideas for Engineers Without Borders International to consider. These are:

Understanding the shared vision for EWB I in the future

Create and analyse a questionnaire for all national (including those who were unable to attend) Engineers Without Borders to understand the values and vision that the national organisations have. From this, EWB-I can start the process of developing new EWB-I tools.

Create a platform

Create an international, collaborative platform where national EWB's can communicate, discuss projects and create global links. This idea was mentioned throughout the discussions and in reference to various topics. A EWB- I platform would be an excellent way to share the stories, challenges and projects about our global network.

- Various discussions mentioned that this could also be in French and Spanish to allow those within the engineering sector in Latin America or other parts of the world to not be handicapped by a lack of English. This could also be a useful way to form regional links as national groups could publicize project opportunities online.
- A mentoring scheme was mentioned to encourage relationships between students and working engineering professionals. This could also be an effective and supportive tool in encouraging those female engineering students to transition and flourish in the engineering sector.
- This platform could also be useful tool for less established Engineers Without Borders organisations as they can learn from past failures. EWB Canada publishes a 'Failure Report' which openly share some of the challenges that they have faced as an organisation.
- This platform could also house all of the resources that national Engineers Without Borders have published and that our global network may not be aware of. This could include: educational resources, learnings, excellent online courses, project management tools, reports into new technologies, funding application structures.

Funding

Student representatives from Honduras focused on the challenge of raising funds beyond the local level (cake sales, car washes). There is an opportunity to build on these personal links with the more experienced EWB organisations so that newer EWB's can benefit from the experience and expertise of better established EWB's as they can support and provide direction in writing funding applications.

The Design Challenge

Representatives from EWB Australia, UK, South Africa, Finland and New Zealand spoke about the potential to create a collaborative and global design challenge. This could bridge the educational gap often faced amongst lesser established EWB's. There was also the suggestion to present it as an online MOOC that did not discriminate based on geography.

Influence Engineering Education:

A theme throughout was the need to focus on project management skills (cross cultural understanding, managing a budget, working with different stakeholders). Whilst technical skills are important, it was also recognised that engineers especially working in local communities, should have exposure to political, social, environmental and economic understanding prior and during project work.

EWB I could have an advocacy role on the global stage.

Feedback from the Global Forum

In addition to the facilitator encouraging participants to feedback during the event, an online google form reflected the success of the event. There was very positive feedback about the location at the Royal Society of Arts and the catering.

86% of participants felt there was adequate/a good amount of time to build relationships and networks

95% of the participants felt that the timings of the sessions were appropriate

100% of participants responded that the forum partially met or exceeded their expectations.

100% of participants would like to attend a future Engineers Without Borders Forum

90% of participants believed that the facilitator was good or excellent in broadening the discussion

Feedback:

‘The subjects that we discussed were really important and wide by nature. Now we can continue building our relationships over the internet.’

‘There were breaks for broader networking and I spoke to a great variety of people during the event.’

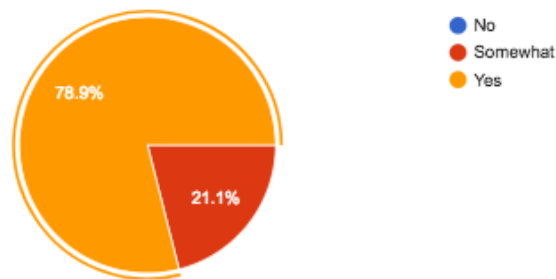
‘It is difficult for everyone to be satisfied with the amount of time for networking but it was sufficient to make connections.’

‘EWB global forums are always an inspiration to me and a driving force to work more towards our goal.’

The feedback highlights the momentum created by the Global Forum in London with many different EWB's interested in hosting future EWB-I events. Representatives from Macedonia, Kosovo, South Africa and Rwanda were very enthusiastic with participants providing feedback that they would like to see EWB projects in the field.

2. Do you think that the Global Forum successfully encouraged you to think about the formation of globally responsible engineers?

19 responses



Thanks

The Global Forum would not have been possible without the continued generous support of our sponsors, Arconic Foundation and the Royal Academy of Engineering. We hope to continue working with both organisations as we continue to enhance and strengthen our existing initiatives as a global network of Engineers Without Borders organisations.



Appendix

Write up of some of the key discussions. The attached file contains a scanned copy of all the discussions. In total, there were 30 separate sessions at 5 different stages of the event.

1. Gender equality and Diversity in engineering

Discussed by: Francisca, Anne, Remi, Emily, peter, Cathy, Sam, Sole, Wellars, Weibke, Annelies, Vigan and Caroline

- Lack of involvement in engineering in France and it is very elitist.
- You can't ignore this lack of diversity, especially as women have a desire for service in their careers- importance of focusing on social responsibility in their careers. Focus on interdisciplinary nature of Eng.
- Diversity would be better and be better for humanity. Needle has moved in the USA (gender division since the 1980s)
- Stereotype plays an important role in preventing diversity. Mentoring is hard for women especially as it is seen as 'weird' for male/ female relationship
- Affluence- Australia has a new program that drastically reduces barriers to engineering at university. The industry is pushing universities to produce a more diverse workforce and breadth of skills for engineering.
- Some US schools are trialling 2 years of liberal arts & 2 years of engineering
- Focus needs to be on people who disagree not the converted.
- Pale, male, stale may feel threatened but need to keep having the conversation. Focus should not be on 'female' engineers but engineers in gender.

Actions

- Need to feminize engineering
- Alter language and challenge others on theirs
- Inspire young people towards engineering, especially children from different backgrounds
- Keep having these important conversations.
- Encourage women to 'take up space' and focus that people are looking for more meaning in work.

2. How to build capacity in developing countries. How can we support local EWB organisations?

Discussed by: Annabel, Megan, Kevin, Luis, Allan, Gabriel and Anne.

- Provide training with a focus on project management and technical training. This ensure projects will happen.
- Funding is a big issue- funding for projects. EWB Honduras keen to know about who funds/ where you can access/ who presents the applications.
- Youth members may not feel that they have the status to apply for large foundations/ funding opportunity and are too focused on their studies.
- There could be a link between more established EWB's and newer bodies.
- A lack of focus on regional links

Actions

- Share stories about fundraising successes and link EWB organisations and provide training on cross funding (Honduras and Norway) to make speculative applications that have the potential to be more effective.
- Draw attention to EWB amongst national and state-owned engineering firms with a focus on EWB's working in country.

3. What is an engineer? Could we all become engineers? How?

Discussed by: Jeremy, Katie, Alban, Albana and Megan

- Engineer is linked to a title and education so they are considered as the only legitimate expert to address technical issues. But being able to solve issues through science isn't as binary as engineer. It's more gradual.
- If knowledge is power then should the engineer be the 'expert' only guardian of their power, or should they allow concerned citizens to understand technical issues and take their own decisions. Engineers need to enter more into the public space and make engineering not so abstract but apply to our everyday life (as it is!)

Actions

- Share engineering power with civil society through education programmes and knowledge sharing.

4. How can we share and leverage student design challenges across EWB- International network?

Discussed by: Katie, Mohammed, Wiebke, Martin and Pete

- Student challenges are run by several EWB's. Opportunity exists to coordinate/ share/ collaborate.
- Strengths: building soft skills, understanding of context, multidisciplinary, project based, student led learning, embeds engineering as a social impact profession at early stage of university education.
- Challenges: clarity of challenge as educational tool not promising to deliver solutions for implementation. Smaller EWB's do not have the resources to create challenges. How to share the educational tools?
- Ideas- link to corporate challenge e.g. airbus 'fly your ideas.'

Actions

- Explore an EWB- I Global Challenge
- Consider an international version delivered as a MOOC
- Seek Arconic Funding for an EWB-I challenge initiative

5. Chapter Management- the good and the bad.

Discussed by: Vigan, Francisca, Gustav, Alban, Cathy and Edward

- Opens transparent communication is often lacking
- Important to make sure that a new EWB member has the right introduction before they start work.

Actions

- A place is needed where younger EWB's can find organisational resources. Place where EWB's can find where other EWB's work and use the learning to impact them (e.g. establishing membership groups). Newer EWB's can learn from the lessons of other national EWBs.

6. Sharing local knowledge globally.

Discussed by: Megan, Jeremy, Annelies, Wellars, Edmond, Francisca, Wiebke and Adan.

- EWB-I lacks a clear vision alignment. This needs to be worked on ASAP.
- Important to know what knowledge and information has been generated by different EWB's.
- Important to share the success stories.
- Regional collaboration in own language (French/ Spanish) is important to share local knowledge globally.

Actions:

- Create an EWB-I questionnaire on what member associations want and involve them in the decisions concerning EWB-I vision and values.
- Collate learning resources that have been created internationally.

7. How do we work together without continuing the developed/ developing power dynamics?

Discussed by: Katie, Emily, Peter, Caroline, Bent, Jeremy and Annelies.

- Need awareness from all involved that the power dynamic exists. That there is a more and less powerful relationship.
- Recognise the constraints- donor funding and compliance constraints- How can we challenge this?
- Need to challenge the dominant wisdom that how the developed countries progressed is the best way. It's not.

Actions:

- To keep talking, keep working together but recognise that it may be a slow process

8. Integrating EWB projects into engineering education and research

Discussed by: Sam, Tommy, Minhal, Bernard, Sole and Annabel

- Learning opportunities outside and inside classroom
- Changing the current focus on academia and mind set of the universities.
- Lack of interdisciplinary training.
- Getting industry to explain the value propositions of hiring engineers. Industry is a leverage point. EWB graduates are unique, diverse, globally orientated and this is something that needs to be promoted more.

Actions

- Give students accreditation for projects
- Train academics to create EWB integrated curricular. EWB integrated curricular
- Honour passion and link to industry to focus on the uniqueness of the EWB student engineers
- EWB- I as an incubator. Ideas to scale.

9. Sustainable growth- the role of the engineer

Discussed by: Annabel, Edward, Gustav and Bent

- Sustainable growth in the 'west'. Need to look at different discussion than just growth.
- Reduce, recycle, reuse. Denmark/ Sweden are at the forefront.
- Engineers do not go into politics as they like solutions.

Actions:

- Focus on the shared economy.
- Create stronger links between environmental NGOs/ awareness groups/ and government lobbyists.
- Engineers should be influencing at a government/ policy level.

10. How could graphic recording be used to develop wider, human focused skills in engineers?

Discussed by: Zhura, Gustav and Remi

- Power dynamics in consultations (an engineering problems and solutions) and unequal social capital means that many voices are lost
- Engineers can be or be seen as, outside society looking in and examining their subjects and people. Not part of society.

Actions

- Zuhura to think about applications and talk to government and understand public policy consultations processes which currently exist.

