



Panel Report: Sustainability and Engineers for the Future

Engineering Professors Council Congress, Cardiff University, 2024

Panelists:

- Dr Manoj Ravi - Lecturer in Chemical Engineering & Leeds Institute for Teaching Excellence (LITE) Fellow
- Dr Maryam Masood - Assistant Professor/MSc Programmes WMG Warwick University
- Dr. Asima Iqbal - Assistant Professor at Warwick Manufacturing Group (WMG), Warwick University
- Prof. Sarah Jayne Hiff - EPC Sustainability Toolkit Project Manager

Introduction

At the 2024 Engineering Professors Council (EPC) Congress, hosted by Cardiff University, the "Sustainability and Engineers for the Future" panel discussion generated significant anticipation. The session brought together four distinguished experts—Dr. Manoj Ravi, Dr. Maryam Masood, Dr. Asima Iqbal, and Prof. Sarah Jayne Hiff—to share their insights on the evolving role of engineers in promoting sustainability. The discussion emphasized the pressing need for Education for Sustainable Development (ESD) within engineering curricula, highlighting the current emphasis on environmental sustainability and the potential of the Society-Industry-Academic model to achieve this goal.

Key Themes and Discussions

1. Embedding Education for Sustainable Development (ESD)

Dr. Manoj Ravi's Insights:

- **Opportunities in ESD:** Dr. Ravi highlighted the importance of embedding ESD in the curriculum by identifying core sustainability skills and linking engineering concepts to the United Nations Sustainable Development Goals (UNSDGs). He discussed the merits of a module versus program approach and the balance between immediate and long-term strategies.
- **Core Sustainable Schemes:** He emphasized the need for accreditation guidance focusing on sustainability and how educators can impact sustainability skills and competencies. Advanced frameworks for ESD, such as system thinking and linking SDGs to IDGs, were suggested as effective strategies.
- **Integration Approaches:** Dr. Ravi proposed integrating sustainability at both the module and program levels, outlining two approaches:
 - **Existing Structures:** Utilizing a narrow curricular approach (piggybacking) and a broad curricular approach (mainstream).
 - **New Structures:** Adopting specialised narrow curricular approaches and broad curricular connecting strategies.
- **Impact on Future Engineers:** He stressed that fundamental engineering principles remain relevant and should be adapted to address sustainability challenges.

Dr. Maryam Masood's Insights:



- **Current State and Future Directions of ESD:** Dr. Masood reviewed ESD's status and envisioned future generations' role in advancing sustainable development.
- **Student Involvement:** She advocated for involving students in decision-making processes that benefit the planet and fostering a mindset that values the three pillars of sustainability—environmental, social, and economic.
- **Research Emphasis:** Dr. Masood called for more research integrating all three sustainability pillars, noting the current focus on environmental sustainability.
- **Collaboration for Sustainability:** She highlighted the importance of collaboration between society, industry, and academia to tackle challenges in embedding sustainability in education.

Dr. Asima Iqbal's Insights:

- **Transferable Skills and Research Methods:** Dr. Iqbal emphasised the need to deliver transferable skills and research methods through teaching modules to both engineering and business students. She advocated for embedding sustainability at all educational levels as part of university efforts to deliver ESD.

2. Activity and Interactive Discussion

An interactive activity allowed delegates to discuss ESD skills and knowledge, identify challenges, and propose solutions. Each table, consisting of 6-8 members, had three rounds of questions, with one member serving as the table representative.

3. Challenges and Solutions for Embedding Sustainability

The panel acknowledged varying levels of progress among delegates in embedding sustainability, from advanced implementation to conceptual discussions. Key challenges and solutions identified include:

- **Communicating the Importance of Sustainability:** Emphasizing that sustainability is mandatory, not optional, within the curriculum.
- **Resource Allocation:** Addressing concerns about the availability of resources, time, workload, and capacity to achieve sustainability goals. Finding a balance between investment in sustainability and compliance with policy and regulations was deemed crucial.
- **Collaborative Discussion:** The panel facilitated discussions among delegates on skills training for future engineers, embedding sustainability into the curriculum, and overcoming related challenges.

4. Introduction to the Sustainability Toolkit

Prof. Sarah Jayne Hiff's Presentation:

- **Overview:** Prof. Hiff introduced the delegates to the Sustainability Toolkit, a resource designed by the EPC to help integrate sustainability into engineering education. The toolkit, supported by the Royal Academy of Engineering and Siemens, was launched in March 2023.
- **Components:**
 - **Knowledge Tools:** Improve user knowledge and provide additional information on sustainability.



- **Guidance Tools:** Step-by-step instructions on performing specific sustainability tasks.
- **Teaching Tools:** Resources to help educators integrate sustainability concepts into curricula.
- **Collaboration Resources:** Facilitate connection and support among users to foster a collaborative approach to sustainability.
- **Contribution Guide:** Information on how users can contribute to the development and expansion of the Sustainability Toolkit and its community.

Conclusion

The EPC Congress 2024 panel discussion highlighted the importance of embedding sustainability in education and provided insights into effective strategies and approaches. The Sustainability Toolkit was recognized as a vital resource for achieving the engineers' 2030 vision, supported by key organisations like the Royal Academy of Engineering and Siemens. The panel emphasized the need for continued collaboration, research, and resource allocation to advance sustainability in education.

Report by: Sadiq Abdullahi