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Supporting Students From Different Universities And Backgrounds To Improve Their Academic And Social Outcomes: Euniwell MASOEE Project Workshop

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SUPPORTING STUDENTS FROM DIFFERENT EUROPEAN UNIVERSITIES AND BACKGROUNDS TO IMPROVE ACADEMIC AND SOCIAL OUTCOMES: THE EUNIWELL MASOEE PROJECT WORKSHOP

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1 INTRODUCTION

There is a notable discrepancy between the relative prosperity of Europeans and the global security and sustainability challenge. The mission of the ERASMUS+ 2020 European University for Well-Being (EUniWell) alliance is to address this. Our project, “Maximizing Academic and Social Outcomes in Engineering Education” (MASOEE) interprets this contradiction for engineering educators, exploring how to ensure graduates make the utmost contribution to societal wellbeing by narrowing attainment gaps. We are combining the expertise of British, French, Italian, and Swedish faculties to identify, share, and ultimately transfer best practices for professional, business, and sustainability skill teaching that is aligned to the EU competency frameworks including EntreComp (Bacigalupo et al. 2016) and GreenComp (Bianchi, Pisiotis, and Cabrera Giraldez 2022). Furthermore, we are finding out how disadvantaged cohorts in each partner faculty are characterized and supported. The project is guided by the following research questions:

- What are the similarities and differences between our students, staff, teaching, and culture?
- How are skills taught and embedded in programmes? What are student attitudes to learning these? How do we currently define and measure social outcomes?
- Which new approaches can we employ improve social and academic outcomes?

2 WORKSHOP DESIGN

We began the workshop by providing participants with an overview of the MASOEE project, sharing our aims, approaches, and activities. We also explored the types of disadvantages experienced by students and STEM based professionals, noting the impact at three main points: pre-engineering studies, during engineering studies, and post-qualification whilst establishing their career (Kricorian et al. 2020; Moscoso 2022; Royal Academy of Engineering 2023). We worked collaboratively with the participants to better understand how students developed their competencies as well as understanding how disadvantage is understood within the context of their own institutions. The workshop allowed participants to reflect on and improve the academic and social outcomes of their students. The learning outcomes were:

- To compare a diverse range of strategies for undergraduate learning of engineering in the themes of technical skills, entrepreneurial skills, professional skills, and sustainability skills.
- To understand more about the learning needs of engineering students from a diverse range of less advantaged backgrounds and explore ways of modifying curriculum and culture to better meet these needs.

Following the initial introduction of the project, the remainder of the workshop was divided into three activities presented to users on the whiteboard (Figure 1): an empathy map to explore disadvantaged students within each participant’s context (left); a diamond nine activity to prioritise the skills most needed by students from a disadvantaged background (right); and brainstorming activity to explore ways of

teaching of these skills could be improved focussing on innovative pedagogies (bottom). Each activity was led by a specific MASOEE team member.

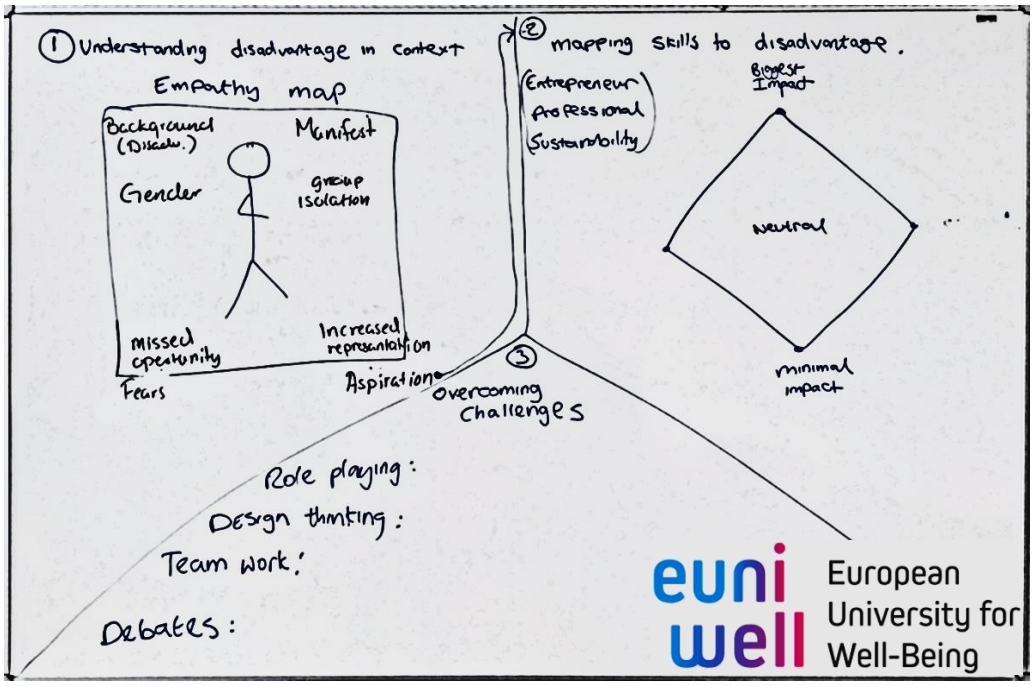

Fig. 1. Whiteboard activities: empathy map, diamond 9, and overcoming challenges.

For the empathy map, the participants were asked to explore characteristics of a disadvantaged student, using the map to scaffold their discussions. The empathy map focussed on four main areas - 'Background' (type of disadvantage), 'Manifest' (how the disadvantage may physically manifest itself), 'Fear' (the impact of the physical manifestation of disadvantage), and 'Aspiration' (what the students strive to achieve). For the subsequent Diamond-9 activity, participants were asked to consider emerging engineering skills in the area of entrepreneurship, professional, and sustainability, and how the skill acquisition of the disadvantaged student profiled in their empathy map would be affected the most and least, with lists of skills in this area being used as prompts. The final activity – overcoming challenges – was to look at those skills with the biggest impact together, with the empathy map, and discuss how emerging pedagogies might be used to help students overcome their fears, reduce their manifest, and fulfil their aspirations. These pedagogies included role playing, design thinking, teamwork, and debates. After the activities concluded, the project team summarised the workshop discussions.

3 RESULTS

18 participants attended the workshop from several countries including Austria, Belgium, Germany, Ireland, Italy, and United Kingdom. They were divided into 2 groups, with a mixture of countries represented within each group to ensure diversity of experience.

3.1 Empathy Map

3.1.1 Background

People in group 1 identified four areas of disadvantage that they felt had the potential to impact their students' aspirations: language, prior education, family support, and learning disabilities. They agreed it is important to reflect on the intersectionality of each area, which led to animated discussions on the implication for students with more than one area of disadvantage. In contrast, people in group 2 identified eight areas of disadvantage: economic, social, cultural, colour, gender, language, internet access, and disabilities.

Notably, each highlighted language barriers and disabilities as a potential impediment to successfully accessing engineering as a discipline. One female in group 2 shared their own lived experience, noting: "When I started, we were three females in a 100 class – it felt like it was hard to belong". Other female group members agreed and reflected that this had inhibited their ability to work within a team or complete a group assignment and consequently develop skills development. However, a male group participant queried whether this feeling would impact female engineers materially; sharing his own lived experience of seeing women take part in successful teams and groups, often assuming leadership roles. Despite this positive observation, female participants felt that overall females are disadvantaged.

3.1.2 Manifest

Building on prior discussions around background, both groups explored how disadvantage may physically present itself. Group 1 linked directly back to the areas of disadvantage that they had listed under 'Background':

- Language - students may miss or misunderstand information.
- Prior education - students may lag behind, feel shame, or disengage.
- Family support - students may miss out on jobs, coaching, or networking if their family does not have a background in a similar professional area.
- Learning disability - students may difficulties with certain areas of academic life e.g., organisation.

Group 2 reflected more generally on the physical impact of disadvantage, noting that struggling students may suffer worsening mental health, including feelings of isolation and shame.

3.1.3 Fears

These physical manifestations of disadvantage may lead students to develop a negative outlook, with group 1 identifying fears students may have, such as lack of confidence ("I'm not good enough"), Feeling overwhelmed, questioning themselves ("Why am I doing this?"), or experiencing feelings of inferiority ("I don't belong").

3.1.4 Aspirations

The groups discussed the types of aspirations that students from disadvantaged backgrounds may have. Group 1 reflected on aspirations which directly negated the fears: "I am good enough", "I want to succeed", and "I will be accepted". In contrast, group 2 linked aspirations directly to professional aspirations such as becoming a chartered engineer thereby increasing their social status.

3.2 Diamond-9

The second activity aimed to map skills to areas of disadvantage, utilising a ‘Diamond 9’ frame as a scaffold. An interesting point observed by the team during this activity, was how each group understood the initial questions presented to them. Group 1 prioritised the backgrounds of disadvantage identified in the first activity, sharing that they felt that “prior education” and “language” had a neutral impact on the students’ ability to learn, whilst “Learning disabilities” and “gender” (specifically female) were deemed to have minimal impact.

Group 2 identified four areas of competency then linked these back to their previous work on the empathy map in terms of type of disadvantaged background and how this may manifest for each student:

- Professional skills - linked to mental health.
- Communication - linked to language.
- Defining Problems - linked to isolation.
- Leadership - linked to social, cultural, colour, gender, language, and disabilities.

For this group, professional skills had the biggest impact on a student’s ability to learn, followed by communication whereas defining problems and leadership were placed closer to neutral. Again, gender was a topic of discussion, with some disagreement over whether it should be included. There was some agreement on it being a positive in terms of sustainability because a mixed group might potentially have a broader perspective.

3.3 Overcoming Challenges

For the final activity participants brainstormed ways to overcome the challenges students face stemming from their disadvantaged backgrounds. While we presented the groups with four key aspects: role-play, teamwork, debates, and design thinking, both groups decided to add more. Group 1 proposed culture, community, and programme scaffolding. Group 2 added role models specifically targeted to underrepresented groups. Role-play garnered a mixed response. Group 1 suggested that it might be unpopular, while group 2 saw the benefits in students acting other roles would benefit communication and leadership skills.

Both groups agreed that teamwork was beneficial if properly prepared and supported. This included ensuring groups were gender diverse, effective mentoring of teams, and monitoring to prevent passenger behaviours (students not actively participating). Group 1 believed that design thinking might pose challenges in terms of its applicability to future jobs; the groups didn’t identify a direct link to help disadvantaged students. Group 2 viewed 'Debates' as a valuable opportunity for students to enhance their communication skills.

4 SUMMARY

The workshop provided a stimulating exercise for engineering educators to consider disadvantaged students by characterising them in an empathy map. This schema allows us to explore how disadvantage might impact skills acquisition, and also how

students' aspirations might be a useful driver in designing pedagogies to narrow attainment gaps and foster social mobility. A key insight we had while running the workshop was that by considering disadvantage as unfulfilled aspirations, and the aspirations themselves as negated fears, as engineering educators we might be more inclined to address different forms of disadvantage through common means, potentially benefitting those students whose disadvantages receive less attention than others'.

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