University of Glasgow

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Outreach Approach to Electronic Engineering Education via Wearable Technology

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Overview

Diversity and inclusion in the engineering degree in the UK have received plenty of criticism. According to the UK's Higher Education Statistics Agency (HESA) report, the number of female students has increased from 16.3% to 20.7% in the last decade [1]. However, still only a fifth of engineering students in higher education are female. Considering this modest growth rate, we predict achieving gender parity by 2050. We, therefore, developed an interactive project that was delivered online using Microsoft Teams, which aimed to encourage more female high school students to embark on engineering degrees.

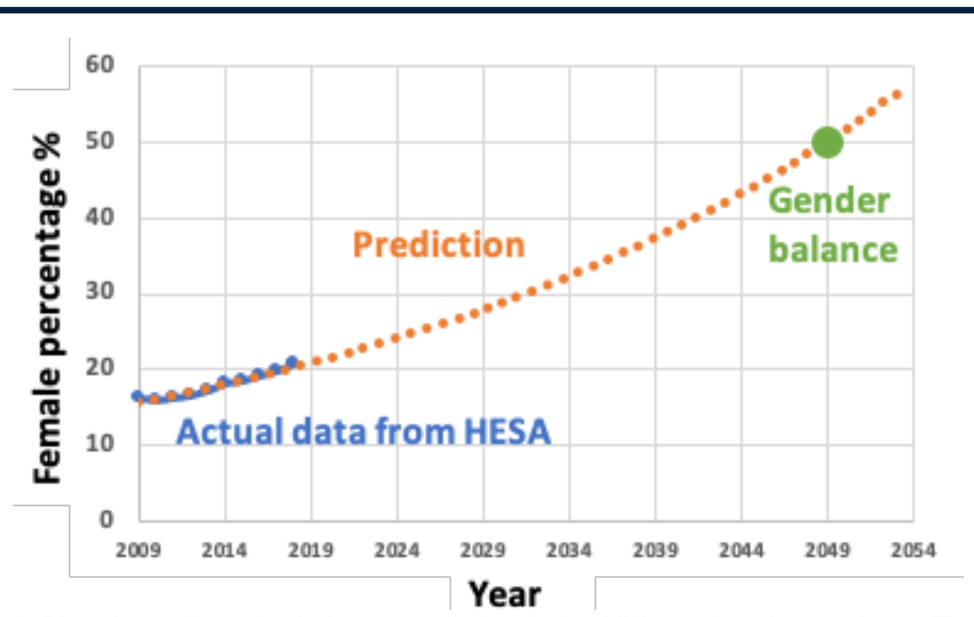

Fig. 1. Diversity and gender balance prediction in the UK's engineering students. The blue line shows actual data from the UK's Higher Education Statistics Agency, while the dashed orange line denotes our prediction. The green dot shows the expected gender balance by 2050.

Online Teaching Activities

Young females were encouraged to consider engineering degrees via synergetic online workshops that invite female students (13-16 years) to engineer simple wearable devices (Fig. 2). Due to the benefits of teaching teamwork in engineering courses [2,3], 18 high school students paired in teams demonstrated different innovative designs which could be 3D printed as wearable technology. Feedback from students was gathered using online questionnaires that were prepared using Microsoft Forms.

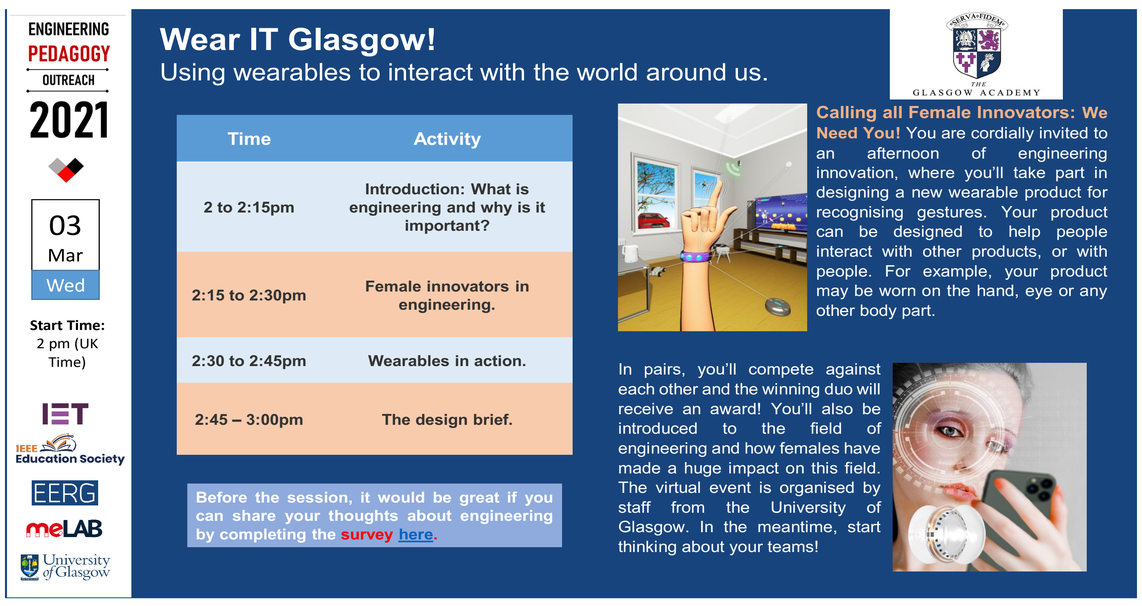

Fig. 2) Student outreach event for 11-17 year olds with Glasgow Academy High School. Introduced the students to fabrication and design work for wearable technology.

Results

The student participated and presented their designs. The best collected design have been selected and 3D printed, as can be seen in Fig. 3.

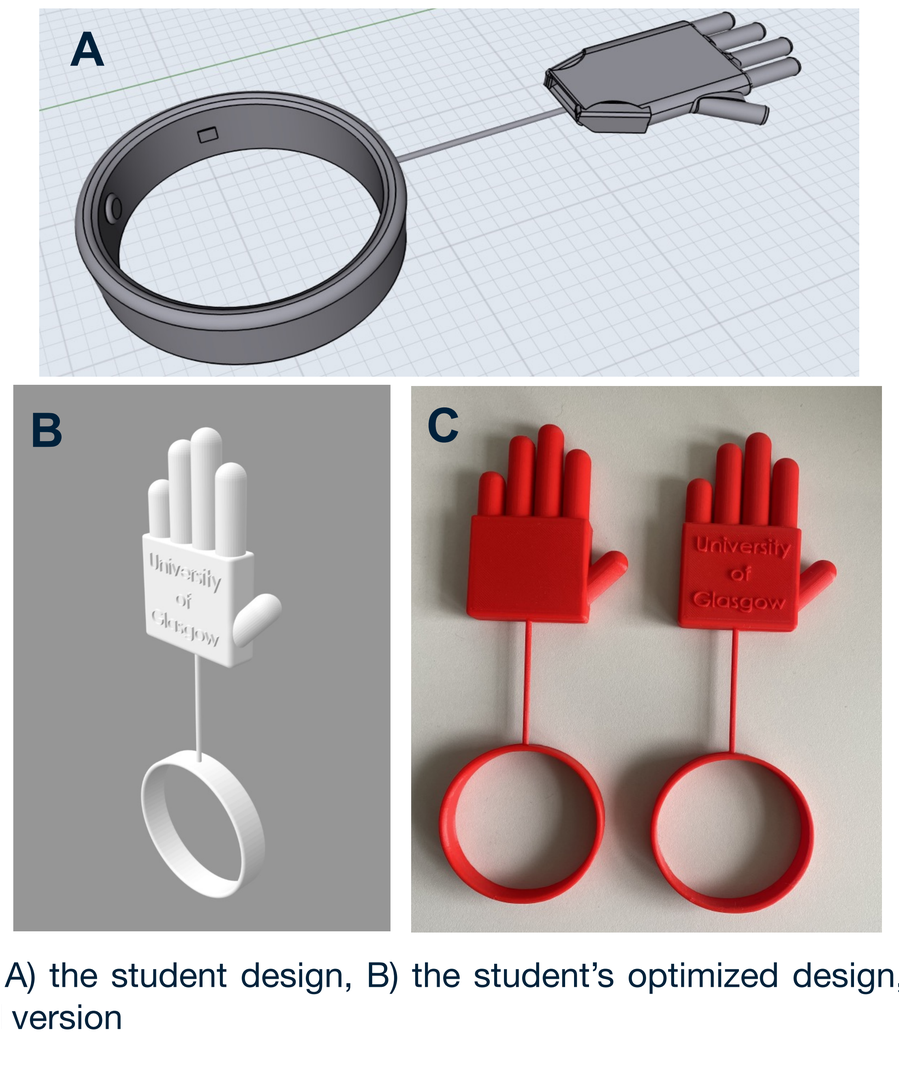

Fig. 3. A) the student design, B) the student's optimized design, C) 3D printed version

Conclusion and Future Work

The proposed online teaching activities in this work aim to teach female high school students about collaboration as well as interpersonal communication and product design. The learning material could augment existing teaching curricula in UK high schools, which aim to encourage more teenagers to study STEM degrees.

References

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