Impact of the EngineeringUK EDI Criteria 2020/21

In Autumn 2020, EngineeringUK (EUK) developed a set of 'EDI Criteria' to identify schools that we would prioritise for our programmes in order to reach more young people from groups under-represented in engineering. By targeting marketing and offering these schools bursaries, we hoped to increase their participation in our programmes – and in doing so, the diversity of young people taking part.

This document outlines data which shows that applying this approach to EngineeringUK's programmes did lead to an increase in the proportion of schools accessing our programmes who were EDI Criteria schools. After implementing these EDI Criteria, for all EngineeringUK programmes, the proportions of schools who met EDI Criteria were at least approximately in line with the national proportion of EDI Criteria schools (ranging from 47%-54% across UK Nations). Additionally, we share data showing that when working with EDI Criteria Schools there were higher proportions of young people from ethnic minority backgrounds, those eligible for Free School Meals, disabled young people and those with special educational needs participating compared to non-EDI criteria schools. This document explores this in more detail.

Did implementing the EDI Criteria for EngineeringUK programmes affect the types of schools that participate?

Engineering UK first used the EDI Criteria from Autumn 2020/21 - the criteria were used to broadly help target communications and marketing of the EngineeringUK programmes. In addition, EngineeringUK introduced an EDI bursary scheme which offered bursaries to schools who met the EDI Criteria, to help them overcome barriers to participation in these programmes.

Using the 2019/20 academic year as a baseline (noting that in 2019/20 academic year the EDI Criteria and EDI bursary scheme had not yet been started), Table 1 shows that for all programmes there was an increase in the number of schools that meet the EDI criteria participating in 2020/21. We believe that this was as a result of doing targeted marketing to EDI criteria schools and introducing bursaries for EDI schools to help them overcome barriers to participating.

Table 1: Percentage of schools participating in EUK programmes that met the EDI criteria

Programme	**2019/20**	**2020/21**
Energy Quest	48% of schools participating in England	64% of workshops taking place in the UK
Robotics Challenge	49% of new schools & 43% of all schools	71% of new schools & 56% of all schools
Big Bang Digital / Fair	42% of UK schools attending	51% of UK schools attending
Big Bang at School	27% of schools participating	83% of schools participating

Big Bang Competition	Approx. 30% of schools - varied across heats and stages of competition	47% of all entries
		27% of winners
Neon	No baseline as Neon started in 2020.	43% of schools for whom we have data

For some programmes there were differences in participation in the programmes and the data collected each year, for example Energy Quest data for 2019/20 is for England only and for 2020/21 includes the whole of the UK. Additionally, there was varying degrees of missing data across the programmes, of particular note a large amount missing from Big Bang Digital and Big Bang Fair, and therefore results for these programmes in particular should be treated with some caution. Furthermore, for the Big Bang Competition, there is only an approximate value provided across all heats and stages of the competition for 2019/20 but for 2020/21 data could be provided for entries and winners separately.

Did implementing the EDI Criteria for EngineeringUK programmes affect the types of young people who participated in the programmes?

We analysed the demographics of the young people reported by their teachers to be participating in the programmes, where the data was available. We compared the schools meeting the EDI criteria against those who do not, to investigate whether there is any difference between the participants in the different types of schools. Data was only available for Energy Quest (from a survey completed by teachers) and Big Bang Digital (from the data completed at registration).

We based this analysis on the following data:

- Big Bang Digital - 645 schools participated, providing data totalling 118,277 young people.
- Energy Quest – 64 schools participated, of which we received demographic information from 47 schools (2,522 young people in these 47 schools).

For both programmes, we have outlined in each section the proportion of data we have for each specific demographic (e.g. gender).

Gender:
For both programmes, we found that there was no difference in the gender make-up of EDI criteria schools as compared with non-EDI schools (see Table 2), with around half of participants in each being female. This is in line with what we might expect, since the EDI criteria did not take gender into account in 2020/21 (this has subsequently been added in an updated version of the EDI Criteria).

Table 2: Percentage of participating students that were female, by programme and whether the school met the EDI criteria

Demographic	No. of students with known data (% of total students participating)	TOTAL	EDI Schools	Non-EDI Schools
NATIONAL AVERAGE*		***50%***		
Energy Quest	1,997 (79%)	50%	51%	49%
Big Bang Digital	40,481 (34%)	52%	51%	54%

NB: Data on the gender of participants was relatively complete for Energy Quest with data available for 75% of the students in the 47 schools who responded, less so for Big Bang Digital with data available for 34%. This low completion rate is less than ideal and therefore some caution should be taken when interpreting the results. Nevertheless, it provides us with some indication of the gender make-up of participants, and we are currently thinking through how to improve completion rates in this year's data collection activities.
*national average based on the mean value for UK secondary schools

Ethnicity
We did see a difference in the percentage of participants from minority ethnic groups between schools meeting and not meeting the EDI criteria (Table 3). The national average percentage of minority ethnic students in schools is 28% and although the Energy Quest programme saw lower participation from ethnic minority pupils than this, there was a higher percentage in the EDI criteria schools (17%) compared to non-EDI criteria schools (11%). For Big Bang Digital, there was a large difference with almost half of participants from EDI criteria schools being from ethnic minority groups (49%) compared with 18% in the non-EDI criteria schools.

Table 3: Percentage of participating students that were from minority ethnic groups, by programme and whether the school met the EDI criteria

Demographic	No. of students with known data (% of total students participating)	TOTAL	EDI Schools	Non-EDI Schools
NATIONAL AVERAGE*		***28%***		
Energy Quest	1,881 (75%)	15%	17%	11%
Big Bang Digital	43,623 (37%)	37%	49%	18%

NB: Completion levels of ethnicity data were similar to gender (75% for Energy Quest and 37% for Big Bang Digital).
*national average based on the mean value for UK secondary schools

Eligibility for free school meals
Data for Energy Quest was completed by schoolteachers in the pupil demographic survey, and, for free school meals, eligibility was recorded for 98% of the pupils from the 47 schools who responded. For Big Bang Digital, data on free school meal eligibility was only available for 30% of the students and in many cases, it was not clear whether the blanks in the dataset were missing data or intended to be read as 0 (that is, there are no young people eligible for free school meals in these schools). We therefore carried out two separate calculations shown in Table 4, for the percentages with blanks removed (excl. blanks) and with blanks considered as 0 (incl. blanks). We see that whether or not the blanks are included does make a significant difference to the percentages of students participating that are eligible for free school meals (increasing from 16% to 49% in EDI criteria schools, and from 4% to 16% in non-EDI schools).

The national average of young people eligible for free school meals in 2019/20 was 18% and, overall, 27% of pupils taking part in Energy Quest were eligible for free school meals and 33% of pupils taking part in Big Bang Digital (where data was recorded) were eligible. Additionally, it is also clear that participating schools that meet the EDI criteria had higher numbers of students eligible for free school meals taking part than in the schools who do not meet the EDI criteria.

Table 4: Percentage of participating students that were eligible for free school meals, by programme and whether the school met the EDI criteria

Demographic	No. of students with known data (% of total students participating)	TOTAL	EDI Schools	Non-EDI Schools
NATIONAL AVERAGE*		***18%***		
Energy Quest	2,469 (98%)	27%	28%	25%
Big Bang Digital (excl. blanks)	35,812 (30%)	33%	49%	16%
Big Bang Digital (incl. blanks)	118,277 (100%)	10%	16%	4%

Due to the amount of blank data on free school meals for Big Bang Digital, the two lines presented represent where blanks are considered missing data and excluded from the analysis (excl. blanks) and alternatively where blanks are considered as 0 and included in the analysis (incl. blanks).
*national average based on the mean value for UK secondary schools

Disability

Data on disability was recorded for 89% of participants from the energy Quest schools that responded and 59% for Big Bang Digital. This includes any disability, impairment, health condition or special educational need that may have been recorded. No known national data was available for the proportion of students with a disability across the UK to use as a comparison.

There were more disabled students participating in the programmes from schools that met the EDI criteria than there were in schools that did not meet the criteria for both Energy Quest (16% vs 12%) and Big Bang Digital (12% vs 7%).

Again, due to the percentage of blanks in the data, for Big Bang Digital percentages of participants with a disability has been calculated in two ways given it was not clear whether the blanks in the dataset were missing data or intended to be read as 0 (that is, there are no young people with a disability in these schools). Table 5 displays the percentages with blanks removed (excl. blanks) and with blanks considered as 0 (incl. blanks) and we see some differences between the calculations, as we would expect, with higher percentages of disabled students participating when only those with known status are included in the calculation for both schools that meet the EDI criteria (12% vs 7%) and those that do not meet the EDI criteria (7% vs 4%).

Table 5: Percentage of participating students with a disability recorded, by programme and whether the school met the EDI criteria

Demographic	No. of students with known data (% of total students participating)	TOTAL	EDI Schools	Non-EDI Schools
Energy Quest (excl. blanks)	2,257 (89%)	14%	16%	12%
Big Bang Digital (excl. blanks)	70,241 (59%)	9%	12%	7%
Big Bang Digital (incl. blanks)	118,277 (100%)	5%	7%	4%

Due to the amount of blank data on disability status for Big Bang Digital, the two lines presented represent where blanks are considered missing data and excluded from the analysis (excl. blanks) and alternatively where blanks are considered as 0 and included in the analysis (incl. blanks).

Conclusion

Overall, we see that in schools that meet the EDI criteria, the percentage of students participating in EUK's programmes from disadvantaged groups and those under-represented in the engineering community are higher than they are in schools that do not meet the EDI criteria. Therefore, by targeting activities at more schools that meet the EDI criteria, we know that we reach more young people from under-represented groups in our programmes.