

**Table S1.** Conceptual framework definitions(DESAs 2001; (RAE, 2016).

Sustainability themes	Definition based on SDGs, SD indicators and challenges
Water quality/quantity	Providing innovative engineering solutions to reduce plastic pollution and access to the needed infrastructure for clean water, sanitation and hygiene for millions of underserved people in the world
Climate change	Protecting the world assets from the effects of climate change by developing resilient infrastructure that can withstand severe climate impacts and its resultant effect on populations
Material consumption & production/energy use	Ensuring sustainable consumption and production patterns by implementing engineering eco-efficiency measures to achieve zero waste, a significant cut to energy usage and carbon emissions from energy
Waste management	Ensuring a reduction or elimination of hazardous reactive waste, and improving waste recycling and reuse
Biodiversity	Incorporating ethics and solid values to innovative development efforts to stop further damage to the planet
Economic performance	Promoting inclusive and sustainable economic growth and developing technology to improve living standards of all through productive employment and decent work
Healthcare	Utilizing technological solutions to provide access to quality healthcare and safe drinking water
Housing conditions	Making the right decisions and thinking of the quality of life and health of the planet for the coming centuries, when designing, locating, building and financing urban infrastructure
Equity	Providing equal opportunities and access to technology for the poorest, most vulnerable and diverse people to access affordable energy, electricity, health and education
Population problems	Developing sustainable infrastructure and creation of jobs to tackle and reduce the inequalities that arise as a result of the population explosion of major cities in the world especially developing ones

**Table S2.** Technique for determining sample size (Krejcie & Morgan, 1970).

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10,000	370
150	108	750	254	15,000	375
160	113	800	260	20,000	377
170	118	850	265	30,000	379

180	123	900	269	40,000	380
190	127	950	274	50,000	381
200	132	1000	278	75,000	382
210	136	1100	285	1,000,000	384

Note.— $N$  is population size.

$S$  is sample size.

**Favourable Opinion-  
First Review**

**Faculty Ethics Committee Headed Paper**  
<ethics-tech@port.ac.uk>

13 August 2018

Applicant Ibifuro Ken-Giami  
Address School of Engineering

Dear Ibifuro

<b>Study Title:</b>	<b>Advancing the three pillars of sustainability in the engineering education: A model for attracting female participants to the engineering profession</b>
<b>Ethics Committee reference:</b>	<b>I.K-G - 02</b>

The Ethics Committee reviewed the above application by a discussion forum between the dates of 30 July 2018 and 13 August 2018.

#### **Ethical opinion**

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the general conditions set out in the attached document.

The favourable opinion of the EC does not grant permission or approval to undertake the research. Management permission or approval must be obtained from any host organisation, including University of Portsmouth, prior to the start of the study.

#### **Documents reviewed**

The documents reviewed at the meeting were:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Application form	V2	13 August 2018
Invitation Letter	V1	13 August 2018
Participant Information Sheet	V1	13 August 2018
Consent Form	V1	13 August 2018
Interview Questions / Topic List	V1	13 August 2018
Questionnaire	V1	13 August 2018

**Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements set out by the University of Portsmouth

**After ethical review**

Reporting and other requirements

The attached document acts as a reminder that research should be conducted with integrity and gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

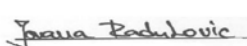
- Notifying substantial amendments
- Notification of serious breaches of the protocol
- Progress reports
- Notifying the end of the study

Feedback

You are invited to give your view of the service that you have received from the Faculty Ethics Committee. If you wish to make your views known please contact the administrator <ethics-tech@port.ac.uk>

**Please quote this number on all correspondence: I.K-G- 02**

Yours sincerely and wishing you every success in your research



Jovana Radulovic  
**Co-Chair**  
 Email: ethics-tech@port.ac.uk

Enclosures:                      *"After ethical review – guidance for researchers"*

Copy to:                              *Supervisors if student / HoD if staff / possibly others if indicated by conditions*

Figure S1. Research ethical approval.

Table S3. Students group Sustainability-themed influential factors for engineering career choice.

Criteria Level weight	Criteria Level Rank	Sub-Criteria	Global Level weight	Global level rank
Social-0.3447	2nd	SC10- Climate change	0.1222	1 <sup>st</sup>
		SC9- Water quality/quantity	0.1214	2 <sup>nd</sup>
		SC5- Waste management	0.1052	3 <sup>rd</sup>
		SC6- Material consumption/energy use	0.1037	4 <sup>th</sup>
Economic-0.3084	3rd	SC8- Biodiversity	0.1032	5 <sup>th</sup>
		SC7- Economic performance	0.0995	6 <sup>th</sup>
		SC1- Healthcare	0.0983	7 <sup>th</sup>
Environemental-0.3469	1st	SC4- Population problems	0.0833	8 <sup>th</sup>
		SC3-Housing conditions	0.0832	9 <sup>th</sup>
		SC2-Equity	0.0798	10 <sup>th</sup>

Table S4. Professionals group Sustainability-themed influential factors for engineering career choice.

Criteria Level weight	Criteria Level Rank	Sub-criteria	Global Level weight	Global level rank
Social- 0.3417	2nd	SC9- Water quality/quantity	0.1334	1st
		SC10- Climate change	0.1192	2nd
		SC8- Biodiversity	0.1105	3rd

		SC5- Waste management	0.1078	4th
		SC6- Material consumption/energy use	0.1014	5th
Economic- 0.2952	3rd	SC1- Healthcare	0.0964	6th
		SC7- Economic performance	0.0859	7th
		SC3-Housing conditions	0.0855	8th
Environmental-0.3631	1st	SC2-Equity	0.0822	9th
		SC4- Population problems	0.0775	10th