



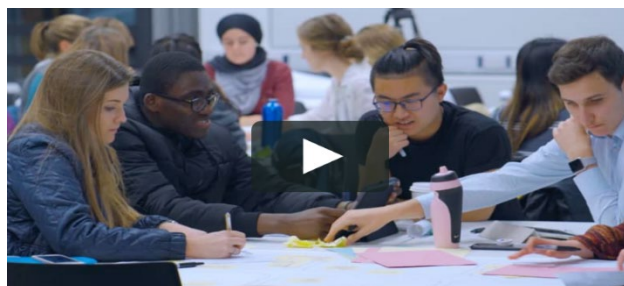
**Globally too much food is wasted. Can you see opportunities for innovation?**

## **The Big Picture Challenge**

### **Overview**

The Big Picture Challenge was an extra-curricular enterprise activity run over five weeks in the first semester of the 18/19 academic year. Thirty-eight students from all disciplines and all levels of study (MBA to first year) worked in teams through a design-thinking process to generate and test ideas to tackle food waste.

This activity was a joint initiative between **Catalina Amihaiesi, Student Enterprise Co-ordinator at the Students' Union** and **Dr Henrietta Sherwin, Research Associate at the School of Management**, with support and funding from the Centre for Learning and Teaching and the Public Engagement Unit. The Big Picture Challenge aimed to explore new ways of learning through curriculum transformation.



*Watch the video: follow a group of University of Bath students as they move through the design process. Share in their response to the food waste challenge, what it taught them about themselves and how they solved a complex problem.*

*"It was a privilege to witness the excellent ideas that all of the student groups presented to reduce food waste and improve sustainability. Even more impressive was that these students came from all over the world, and were put together in random groups. The fact that not only did they all gel and work together, but that the output was so good shows the value of this kind of cross disciplinary, cross nationality team creation in the best possible way. It was also clear that all of the students involved were highly committed to sustainability, the environment, and tackling climate change. It was good that they had this opportunity to show those beliefs in such a positive way."*

**Dave Broadway**, Bath alumnus, Chairman of CFH Docmail (Judge)

*"I thoroughly enjoyed hearing about the students' ideas for tackling food waste. They were all creative, well thought out and deserving of merit. At this critical point in history where we must tackle sustainability challenges head on if we are to avoid the catastrophic consequences of climate change and our throwaway society, I felt inspired and encouraged by the commitment and energy that these students put into their projects. I hope that getting involved in these sustainability challenges will help students to appreciate the importance of the role they can play in changing the world for the better, at University."*

**Libby Sandbrook**, Head of Circular Economy at Business in the Community (Judge)

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Dave Broadway, Chairman of CFH Docmail  
Libby Sandbrook, Head of Circular Economy at Business in the Community  
Members of COP21 who helped recruit students

## Introduction

This report outlines why we embarked on the Big Picture Challenge and what we learned from this process. We hope that it will inspire others to embed design thinking into their own teaching practice as part of the curriculum transformation process. This report sits alongside a video which documents the challenge. It will enable faculties to see just one example of how design thinking has been applied, giving them the opportunity to imagine how they could incorporate a similar challenge into their own courses.

We designed the challenge to meet student demands 'an opportunity to make a difference to something they care about' and serve as an experiment to develop a different learning experience to inform the curriculum transformation process at the University of Bath. Participants addressed the issue of food waste using design thinking as a method and mind-set to explore complex problems and stimulate peer-to-peer learning across disciplines.

Our main aim was to provide a space for creative thinking beyond individual disciplines and without the pressure of grades. Students could take risks, think out loud without embarrassment and be exposed to ideas and thinking from other disciplines, nationalities and study levels. They were taken through a design thinking process to generate ideas on how to approach the problem of food waste from multiple perspectives and test the desirability and viability of those ideas. In so doing, participants developed key transferrable skills: the ability to think creatively and critically, take the initiative, and work collaboratively towards common goals within diverse teams.

As we learned, it was a challenging but rewarding process for the organisers and students alike. Design thinking is not for the fainthearted, but the reward is to see the empowering of students to be creative, generate ideas, be confident to share them with their peers and apply them in practice. It is tantamount to giving them the key skills that they will need when they leave university to do whatever they choose - being empathetic, open-minded, flexible, adaptable and persistent.

We begin by exploring what enterprise education is and what we learned from talking to students at Bath. We then summarise the activities included in the challenge with a focus on design thinking as one of the many approaches to deliver experiential learning. Next, we look at what students from different departments and levels of study got out of it. Following these insights, we candidly discuss the obstacles involved in delivering such activities and what we would do differently next time. Finally, we provide suggestions and resources for anyone interested in designing enterprising learning experiences at Bath.

## **Part 1. Preparing students for life - the need for enterprise education**

Enterprise education is the future of learning and development according to employers and students alike. To thrive in the 21<sup>st</sup> century where all industries experience rapid change and constant reinvention, graduates have to think beyond the borders of their disciplines and be flexible and constantly adapt to change.

Enterprise education as an approach to learning focuses on equipping students with an awareness, mind-set and capability to generate original ideas in response to identified needs, opportunities and shortfalls, and the ability to act on them, even if circumstances are changing and ambiguous; in short, having an idea and making it happen<sup>1</sup>.

Quite often traditional education provides students with the experience of a solid, secure chain of cause and effect and encourages them to build towards a 'right' answer or move towards a pre-set destination based on a reality defined in class and within the boundaries of a discipline. In order to prepare students for solving complex problems in jobs that do not yet exist, we have to support them in getting better at figuring out where they are going when they don't actually know the destination.

For an in-depth comparison between enterprise education and traditional education, please see figure 1 below. We believe in an integrative approach that aims to avoid dualisms and throughout this report we look at opportunities to build and deliver student-centred, multidisciplinary, and experiential learning opportunities within existing constraints, as well as challenging main assumptions.

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<sup>1</sup> Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers (2018), available at: <http://www.gaa.ac.uk/en/Publications/Documents/Enterprise-and-entrepreneurship-education-2018.pdf>

	POSITIVISM TRADITIONAL EDUCATION TRADITIONAL EDUCATION SCIENTIFIC METHOD	INTERPRETIVISM PROGRESSIVE / CONSTRUCTIVIST EDUCATION ENTREPRENEURIAL EDUCATION ENTREPRENEURIAL METHOD	
Science as...	<b>Simplicity</b> ...reductionist	<b>Complexity</b> ...holistic	(Deshpande, 1983; von Bertalanffy, 1972)
Learning as...	...standardized	...localized and child-centered	(Tynjälä, 1999)
Entrepreneurship education as...	...single-subject	...multidisciplinary	(Cotton, 1991)
A method to...	...harness nature	...unleash human nature	(Sarasvathy and Venkataraman, 2010)
Scientist regards...	<b>Individual</b> ...reality a concrete structure	<b>Social</b> ...reality a social construction	(Cunliffe, 2011)
Learning as...	...individual work	...social interaction / storytelling	(Jeffrey and Woods, 1998; Egan, 2008)
Entrepreneurship education as...	...know-that	...know-who and know-how	(Cotton, 1991)
A method for the...	...objective	...intersubjective	(Sarasvathy and Venkataraman, 2010)
Science process...	<b>Content</b> ...linear	<b>Process</b> ...iterative	(Cunliffe, 2011)
Learning activities with...	...product focus	...process focus	(Jeffrey and Woods, 1998)
Entrepreneurship education as...	...content	...process	(Cotton, 1991)
A method that is...	...linear	...iterative	(Sarasvathy, 2001)
Science should be...	<b>Detached</b> ...dispassionate / value free	<b>Attached</b> ... meaning-making / ...value-bound	(Cunliffe, 2011; Lincoln and Guba, 1985)
A classroom where...	...learner is passive	...learner is active and emotional	(Tynjälä, 1999; Egan, 2008)
Entrepreneurship education as...	...absolute detachment	...emotional involvement	(Gibb, 1987)
A method that is...	...transaction based	...commitment based	(Sarasvathy and Dew, 2005)
Science about...	<b>Theory</b> ...objective reality	<b>Practice</b> ...lived experience	(Weber, 2004)
Learning focusing on...	...inert knowledge	...practical experiences	(Tynjälä, 1999; Egan, 2008)
Entrepreneurship education with...	...emphasis on theory	...emphasis on creation	(Ollila and Williams Middleton, 2011)
A method for...	...observation & "law" discovery	...action & co-creation	(Sarasvathy and Venkataraman, 2010)

Fig. 1. Entrepreneurial education as embedded in debates in philosophy, education and entrepreneurship<sup>2</sup>

### How students at Bath view enterprise education

Catalina Amihaiesi, Student Enterprise Coordinator, collected feedback from students during the 17/18 academic year to inform the ongoing development of the Student Enterprise offer as well as understand students' motivation behind joining the various SU enterprise activities.

Catalina learned that enterprise education is a platform for experiential learning that addresses three main pain points that students at Bath have:

- A. More opportunities to make ideas happen: students want more support to act on a wide range of ideas born from their own observations and interests without the pressure of grading or having to turn their ideas into new businesses.
- B. More learning by doing: 'I joined Enactus Bath because I feel I can't do much as a student and I want to have a visible impact'; 'I personally do not learn anything sitting down listening to a lecturer. I learn through experience and figuring out things for myself'.

<sup>2</sup> Lackéus, M., Lundqvist, M. and Williams Middleton, K., 2013. How can entrepreneurship bridge between traditional and progressive education?. In *ECSB Entrepreneurship Education Conference; Århus, Denmark; May 29-31*.

- C. More peer-to-peer learning across departments: students want to have more opportunities to ‘meet students from other departments who have the same interests as me’.

## Part 2. Design thinking as a way to approach complex problems

Most problems worth solving are wicked: they are dynamically complex, interdependent, high-stakes dilemmas with no simple or obvious definition or solution<sup>3</sup>. From working on a new idea to choosing a career, students are constantly facing wicked problems in real life. Some higher education establishments have taken this on board, for example Saïd Business School runs ‘a mapping the system’ competition rather than a business plan competition.<sup>4</sup>

Design thinking is just one method to learn about how to approach complex problems and it is being used worldwide through:

- Focus on people – putting yourself in the shoes of your users and learning as much about them as you can, this way you are more likely to create solutions that address a real need.
- Collaboration – by bringing people with different backgrounds together and enabling learning in real time from external stakeholders.
- ‘Real world’ testing - improving ideas by testing them early and often.

Design thinking helps students radically change how they go about exploring real-life problems and creating solutions to those problems, and it encourages them to collaborate across disciplines.

As a mind-set, design thinking encourages students to imagine the world from multiple perspectives, to embrace experimentation, focus on actions rather than discussions, collaborate in diverse teams and be mindful of the process used to bring out insights and solutions from a diverse group of stakeholders.

“In my course the right answer is always numerical, it’s always right or wrong and someone can easily disprove it by showing you a different calculation. The challenge helped me develop a new understanding of my own and other people’s ideas.”

*3<sup>rd</sup> year student, Engineering*

“My previous learning was limited (...) every day we talk about profits and the financials of a company. This challenge opened up my mind.”

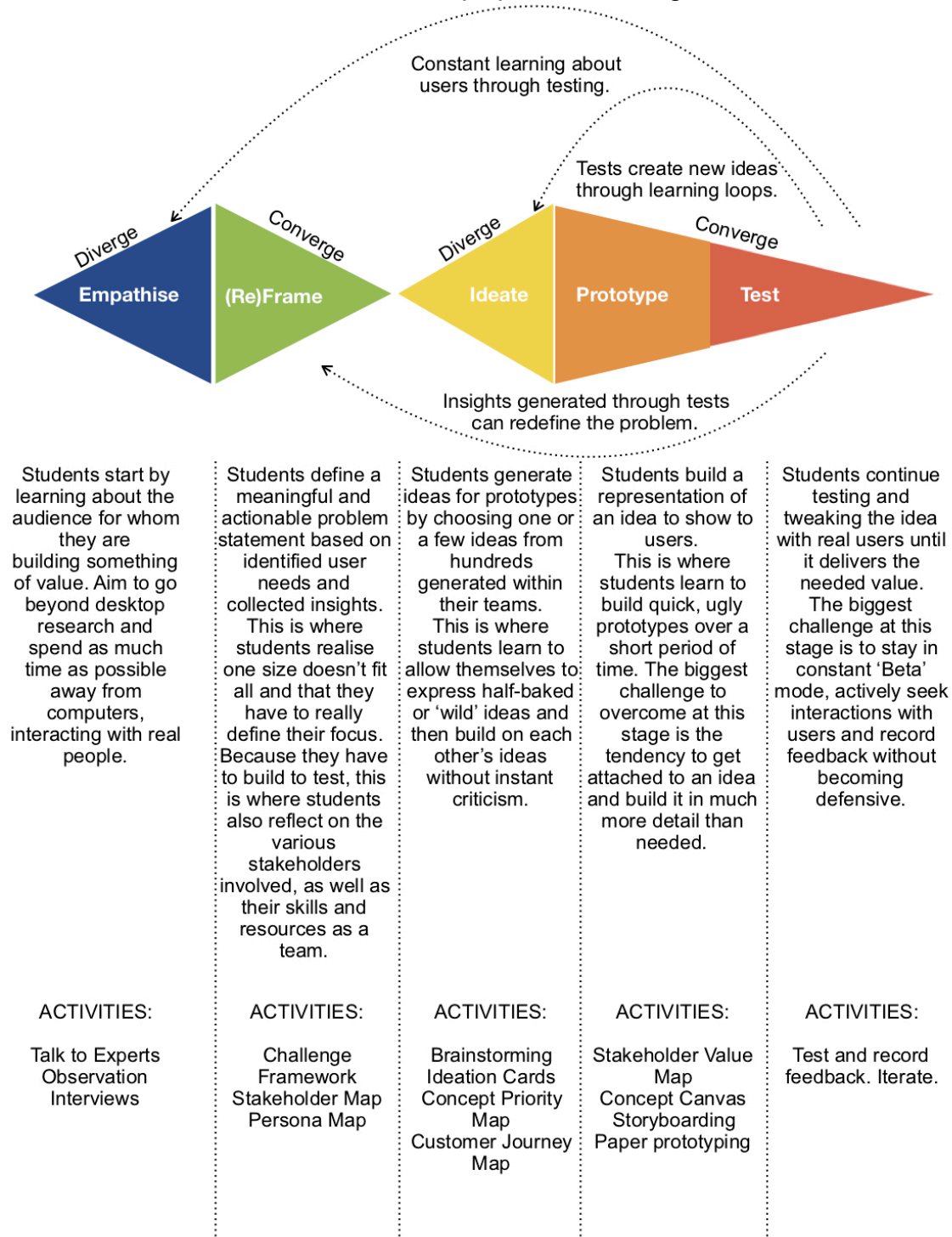
*MSc student, School of Management*

<sup>3</sup> Lake, D., Fernando, H. and Eardley, D., 2016. The social lab classroom: Wrestling with—and learning from—sustainability challenges. *Sustainability: Science, Practice and Policy*, 12(1), pp.76-87.

<sup>4</sup> <http://www.oxfordglobalchallenge.com/>

According to the World Economic Forum<sup>5</sup> the top three skills needed in 2020 are complex problem solving, critical thinking and creativity – all skills honed through design thinking.

As a process, design thinking is a non-linear framework that follows an iterative process broken down into a number of steps presented in figure 2.



<sup>5</sup> <https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution/>

*Fig. 2. Design thinking: steps to approach a wicked problem through an iterative process.*

## **Part 3. The Challenge**

### Designing with students in mind

The first iteration of the Big Picture Challenge was based on the student pain points collected by Catalina Amihaiesi during the 17/18 academic year and was taken back seven students leading three SU-affiliated student groups to test whether their views had been interpreted correctly. We worked with them during February and March 2018 to further shape the challenge – topic, duration, scheduling and ways to promote the challenge to more students. We wrestled with whether it should be a competition or a collaborative process and particularly how prescribed the challenge should be. We settled on the format of a competition offering a prize of £300 (£50 per team member) to a winning team, but also certificates of attendance and follow-up support for everyone interested in taking their idea forward.

### The structure of the challenge

We chose the dates and duration of the challenge to fit around coursework and allow students from all departments and levels of study to attend. See Annex 1 for the overall agenda.

We ran all workshops in flat rooms with a capacity of 80 seats and plenty of wall space, as students were required to work in teams during each workshop and encouraged to move around and place large sheets of papers and post-it notes on the walls. Each session ran from 6.15 – 8 pm, with an extra hour spent each time to arrange the desks for group work and put them back again afterwards.

All presentations, tools and reflection sheets for each session are available on Moodle at <https://moodle.bath.ac.uk/course/view.php?id=58251&section=1> or search 'Student Enterprise' and self-enrol.

### Participation

We advertised the challenge for two weeks at the beginning of the first semester through plasma screens, SU-affiliated student groups and targeted emails to faculties that had expressed an interest in what we were trying to do, across all departments. This was important to ensure we had representatives from all disciplines.



To apply, students had to fill in their contact details and answer the question: 'Why is it important to you to attend the challenge?' All answers are available in Annex 2. All students were made aware of the fact that we only had a maximum of 40 places available and we were looking to get a diverse cohort with participants from all departments, all levels of study representing as many courses as possible.

Out of the 57 students who applied, we accepted 45, rejecting some applications from departments that were overrepresented. We accepted more students than places available as we expected some students to change their mind, but we were equally prepared to deliver the challenge for a larger cohort.

Five students emailed us shortly after being accepted to decline the invitation due to clashing schedules. Two other students dropped out shortly after the kick-off event as they 'suddenly became inundated with work and course related commitments', leaving us with 38 participants who finished the challenge. A detailed demographic report is available in Annex 3. Attendance throughout the challenge is detailed in Annex 4, which also provides an overview of the teams.

### What happened each week

#### *Opening Event: Food Waste Realities*

All accepted participants were invited to attend 'Food Waste Realities', an event open to all students and staff, one week before the first workshop as a way of developing a sense of empathy towards the different groups affected by food waste and gain insights into what they need or how they respond.

Students listened to and met a number of experts in food waste who provided an overview of the issue from different perspectives:

**Trewin Restorick, CEO of Hubbub** - Hubbub is a national charity that creates campaigns offering practical solutions to environmental challenges.

**Jeff Davison, Distributive Sales Manager at Unilever** - Jeff has been with Unilever for nearly 20 years and as a trained chef, he understands the impact food waste has in a professional kitchen.

**Tim Rawlings, Project Officer at B&NES Council** - Tim works on campaigns to reduce waste and recycle more for the Council. Tim shared the main issues and priorities for the Authority and the industry.

**James Rock, Design Thinkers UK** – James did an introduction to design thinking and the challenge. When asked if they had heard of design thinking, only one person in the audience raised their hand.

James Rock of Design Thinkers UK was the facilitator for the first three workshops. Apart from his work with Design Thinkers UK, he also developed design thinking tools specifically for social enterprises<sup>6</sup>.

### *Week 1: focus on Framing*

First workshop by James Rock from Design Thinkers UK was focused on forming teams and getting each team to set their own challenge within the general issue of food waste. This corresponds to the second step in the design thinking process, that of framing the challenge.

Students were randomly assigned to six teams by lining up according to shoe size and counting along the line. To break the ice within their teams, all students had to introduce themselves and mention their favourite toy or game as a child.

Students were then introduced to the design thinking mind-set, specifically to the fact that there are no 'wrong' or 'right' ideas which helped to reduce the fear of failure and encourage participation. Expectations related to the overall experience were also managed by talking about how the design thinking process feels uncomfortable at times as students continue to look at an issue from many different perspectives instead of narrowing down an idea straight away. Throughout each workshop, the facilitator continued to engage students in short reflective moments about the way they perceived the group work, each tool they used and the entire process.

'I did product design at school, so I'm used to brainstorming a lot of things, but I lost touch with that, I haven't really done it for a service either, so it was quite interesting to apply different things'.

*3<sup>rd</sup> year, MEng (hons) Chemical Engineering*

The following tools were used to guide students:

Challenge Framework Map – using the 5W's (Who, What, When, Where, Why), each team fleshed out their own challenge and completed a team challenge statement.

Stakeholder Map – teams identified and grouped stakeholders for their challenge.

Persona Map – teams were asked to think about one person for whom they were designing a solution. This tool was explained during the workshop and teams were asked to independently work on it throughout the week.

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<sup>6</sup><http://toolkit.designthinking-socialup.eu/en/training-area>  
<https://www.linkedin.com/in/jamesrockuk/?originalSubdomain=uk>

### *Week 2: focus on Ideation*

The session opened with a recap of the persona maps each team had to build over the previous week. All teams decided to focus on the student lifestyle and build personas based on their own or their friends' personal experience on campus.

The facilitator also addressed the team dynamics and introduced the idea of a team coach role that could improve group work and communication. Team members would take turns in being team coaches and observe and feedback to the group. None of the groups actually implemented this after the workshop but it raised awareness of main challenges and opportunities that occur within diverse teams.

The following tools were used to guide students:

Customer Journey Mapping – teams had to flesh out the entire experience of their customer

Ideation – each team had to 'go wide' and generate a large number of ideas that the team could then filter into the most practical or most innovative ones.

Concept Priority Map – helped each team evaluate ideas generated in the Ideation phase

### *Week 3: focus on Prototyping*

Teams were introduced to the storyboard canvas as the main exercise for paper prototyping.

The following additional tools were used to guide students:

Stakeholder Value Map – students had to work out what value their idea would bring to the different stakeholders involved (money, social impact, reputation etc.).

Concept Canvas – teams started to flesh out a time line for activities and incorporate some of the results of the testing, the assumptions each team made, potential challenges, and unintended consequences. Filling out the canvas made some students realise they were still struggling with the process of ideation and incorporating feedback from other real users instead of personal assumptions.

Part of this week was also a '*Remix and Improve*' session hosted by Apple Southgate where teams formed pairs and challenged each other's assumptions and stories depicted by their storyboards alongside experts from Apple and a few additional guests.

'I think you need to take away from Science sometimes. If you are going to be employed by a company, they are not going to look for a straight academic, who has read every article, knows how to write an essay in their sleep. They want these transferrable skills, they want to know that you are a person that works well in a team, that is able to manage effectively, think innovatively'.

*4th year, Biomedical Sciences*

### *Week 4: focus on Entrepreneurial Mind-set*

This session was delivered by Professor Dimo Dimov from the School of Management and introduced some of the realities around turning an idea into a financially viable proposition.

Professor Dimov also introduced the students to the entrepreneurial mind-set by combining business examples with a reflective exercise based on his Entrepreneurial Style Assessment.

By this point most teams had expressed the need for more time to work on their ideas, so we replaced the Office Hours in Week 4 with a pizza night in the Student Leaders' Hub in the Virgil Building. We encouraged teams to use the time to work on their ideas or talk to us. Fifteen students attended and found the session useful for catching up with their teams and mingling with others.

### *Week 5: focus on Presenting*

The session was delivered by Catalina Amihaiesi, Student Enterprise Coordinator and started with a reflective exercise – see annex 5.

Students were given tips on what makes a good presentation and were given 30 minutes to prepare their first presentations. Each team had to deliver the presentation to the entire room with other teams providing feedback on post-it notes. The workshop encouraged all students to get more comfortable with delivering 'less than perfect' presentations and receive real-time feedback on their progress from their peers.

'It was quite chilled out and I guess that helped to build confidence in presenting. If you failed, well not fail, but even if you stumble or something, it is not like some coursework, some group project where you are worried about what grade you are going to get.

*4th year, Psychology*

### *Presentation Day*

Each team had 5 minutes to present to a panel of judges, followed by 10 minutes for Q&A.

The judges were asked to score each team from 1 to 10 on the following two dimensions of their presentation:

1. The team's proposition to tackle food waste

#### Need

Have they clearly identified the problem/challenge?

Have they clearly justified the problem?

#### Solution

Has the solution to the problem been clearly presented?

How well explained is the value for the customer?

Who are the other stakeholders? Have they explored what value it could bring to them?

To what extent have they looked at existing and alternative solutions?

#### Testing the solution

Have they tested their idea and have they learnt from the feedback?

Have they considered how they might collaborate with other stakeholders?

Have they identified early adopters?

Is the proposed solution realistic?

#### 2. Overall presentation

Is the team displaying enthusiasm and energy for the idea?

Is there a sense that they worked well together as a team, did they use different tools to present and keep the audience engaged?

Questions from judges are clearly answered.

It was made clear to the judges that the key criteria was to understand to what extent the team had fully engaged with the design thinking process, particularly show that students had engaged in testing and iterating their ideas with students and other stakeholders beyond their team.

The judges who kindly accepted our invitation were:

Dave Broadway - Bath alumnus, Chairman CFH Docmail

Libby Sandbrook - Head of Circular Economy at Business in the Community

## **Part 4. Impact**

Providing enterprise education does not limit itself to encouraging students to start new businesses. Enterprise education is a way of designing and delivering curricular and extra-curricular learning experiences that prepare all students to become creators and problem solvers in changing work environments. These learning experiences help students develop a 'can-do' confidence, a creative questioning approach, and a willingness to take risks, enabling them to manage workplace uncertainty and flexible working patterns and careers irrespective of what they want to do after they graduate. It also encourages them to take responsibility for their own learning process, which has a positive impact on how they connect with the university and community, as well as on their future ambitions.

Assessment in enterprise and entrepreneurship education is generally considered to be a persistent weakness mostly because of the non-cognitive skills students develop as well as the unique way in which each student reflects on the same experience.

During the last week of the challenge we asked all participants to provide us with feedback on their overall experience by filling out an anonymous survey as well as by meeting with Catalina Amihaiesi for a short, informal chat. Most participants were already preoccupied with course assignments by mid-November, which had a considerable negative impact on our attempt to collect feedback at the time. A total of 10 participants provided us with in-depth feedback by mid-December.

We acknowledge the information gathered from the students who accepted to sit down with us after the challenge is not representative for the entire cohort. However, their feedback provides us with powerful insights and suggestions for future iterations.

The impact the Big Picture Challenge had on the participants can be grouped under the following categories:

#### Employability

- A final-year student in Biomedical Sciences who 'never had the opportunity to project manage something that is not in the lab' discovered she 'really enjoys working with other people' and is now considering 'the commercial side of things, rather than staying in a lab';
- A 3<sup>rd</sup>-year Engineering student secured a placement by presenting his experience with the Big Picture Challenge; the student was asked to talk about the challenge during each interview.

#### Entrepreneurial mind-set and approach to solve complex problems

- A PhD student learned that having an entrepreneurial state of mind is useful for approaching a PhD because 'you are constantly selling yourself and your project';
- A 3<sup>rd</sup>-year Engineering student who 'always wondered what it would be like to be an entrepreneur' and 'read a lot of books on how to be an effective entrepreneur' learned 'how to think, how to begin the journey, how to come up with ideas, see if they are going to work, test in real life';
- 'The process opened my eyes to the need for collaboration to tackle large issues in society. Individuals really can and need to make a difference to generate wide spread change. The challenge made me realise that in the future I want to work for a company that prioritises taking action to make a positive change in society.' – 4<sup>th</sup>-year BSc (hons) Management with Marketing

### Working in a team and diversity of perspectives

- A 4<sup>th</sup>-year Psychology student discovered 'how helpful it is learning in groups, a lot of time at university you are just working independently';
- 'One of the main positive aspects of the challenge was that there were a lot of students from different backgrounds that enabled the creative process in the challenge to really flourish. And it was really enhanced by the fact that people came from different backgrounds and had different experiences (...) they brought to the table. (...) You develop new skills, you learn a lot more, you learn how people think, the way that you can adapt your thinking, and how they are thinking, you can sort of extract some bits of their creative process.' - 3<sup>rd</sup>-year MEng (Hones) Chemical Engineering
- 'Accepting that all the ideas aren't the best, we had so many different backgrounds, it was a multidisciplinary challenge, so I was from psychology, engineering, business backgrounds. I was more focused on the motivators and factors, the behavioural change, whereas other people were more focused on the logistics, the money, so we complemented quite well. It did also cause quite a few clashes sometimes as well'. – 2<sup>nd</sup> year, Psychology
- 'I'm an overseas student so I never worked with others who come from other countries before, so I thought it would be really a challenge for me. So I chose to join this to learn more about other people from other countries and continents, how they think and how they shape their ideas or how they work. At first I was really nervous because of many barriers like language and cultural barriers but it turned out that everyone in the team enriched my thoughts.' – MSc in Entrepreneurship

### Student experience

- 'I haven't stopped talking about it, since I've done it, so I think that says a lot about what the experience has been. (...) It was a phenomenal experience, I'd recommend it to anyone.'
- 'I was very creative at school, but coming to University my degree is so set in stone. It is like, here is a problem, solve it. It is so mathematical that I do not get like to think about aesthetics, stakeholders or other people who are involved in the service I'm providing, I'm just solving a technical issue. So to be able to be involved with the consumer, it is quite exciting and I can bring that aspect of my personality out into the design of the product or the service we deliver.' - 3<sup>rd</sup> year MEng (hons) Chemical Engineering
- An overseas MSc student from School of Management thought the challenge offered 'a priceless experience of making new friends, learning new cultures and shaping new ideas'.

## Part 5. Reflections

### Group work and time constraints

As the Big Picture Challenge was designed as an extra-curricular activity that required an estimated four hours per week, it ended by the time undergraduate students are absorbed by course assignments.

Developing solutions to complex problems through following the iterative process of design thinking requires a considerable amount of time and an active participation from the entire cohort throughout all the stages. When asked how much time they allocated for the challenge, participants mentioned an average of 2.4 hours/week on top of the weekly workshops, which brought the total to 28 hours per student over five weeks.

Participants mentioned interacting with and learning from a diverse team as one of the main benefits of taking part in BPC. However, we underestimated the number of students who had no previous experience of working in groups across disciplines and different backgrounds. As one participant told us after the challenge, course group work often means 'there is six of us and we all think the same, we have the same ideas'.

All teams experienced different communication challenges that were further amplified by diverse backgrounds. Having all levels and all disciplines working together meant that finding a time to meet outside the sessions was challenging. It also meant that certain members had other commitments so that some teams were missing members at some sessions.

We offered office hours for questions and feedback but only two participants used them - one student came forward saying that she felt she could not express her opinion in the group and another just wanted clarification about what was expected as he was finding it very difficult to switch from 'grades' to something much more open. Turning the office hours in Week 4 into a casual Pizza Night helped with addressing some of the communication challenges in a relaxed group setting.



Reflecting on their experience, participants whose teams didn't benefit from instant 'team chemistry' acknowledged they haven't assigned team coaches due to perceived lack of time, focusing instead on making progress with the task and ignoring as much as possible any communication challenges, a strategy they often adopted during course assignments.

### Testing and working outside one's comfort zone

Observations and feedback collected after the challenge indicated that students struggled to identify and define a specific problem in the context of the wider challenge of food waste, to reach out and talk with real-world stakeholders and to execute planned actions.

A key aspect of designing thinking is 'testing' ideas and being in constant dialogue with real beneficiaries. Only half of the groups engaged with other students beyond their group or friends and none followed-up with the mentors we provided. We underestimated how difficult it was to switch from being taught one way 9 to 5 and then having to switch gear in the evening and talk to people off canvas. Participants found it difficult to go out on campus and talk to people they did not know, for most it was outside their experience and comfort zone.

Reflecting on their experience, students reported two main reasons for not using the design thinking tools provided to test their ideas with real users: lack of time to coordinate with a large (five to seven team members) and diverse team and over-confidence in the solution generated by the group based on previous personal experience or desktop research.

In hindsight, all interviewed participants acknowledged the importance of iterating on their idea based on feedback from real users. When asked what would have helped them do that, participants suggested embedding field research into the planned activities of the challenge and putting more pressure or providing more incentives for each team to constantly present results from interacting with real users.

### Practicalities

- Each workshop started at 6.15pm and students were flagging – we received comments about snacks, which we supplied for future sessions.
- Practical issues of where to store the tools (printed on A0 sheets) and how to work on them as a team.
- The physical space was an effort to set up, we discovered there are no spaces on campus fit for design thinking exercises for large groups.

### Judging and Outcomes

The lack of testing was reflected in the final presentations and the judges chose the winners on the basis of those who provided evidence that they had gone beyond their own team and close friends to test their ideas. The winning team put forward a

simple and feasible idea to provide 'point of use' information in student kitchens giving information on food storage and recipes for leftover food to prevent waste.

Other ideas ranged from education projects to food apps to cooking classes.

This final session was a great opportunity to consolidate the learning and showed the importance of choosing the right judges as their input and questions themselves were a good form of 'testing' as it was their first exposure to the ideas.

All groups wishing to take their idea forward will be given support to do so but it is too early to say whether they will. The student feedback overall shows that the learning was very much around self-discovery, empowerment, confidence, how to work in teams with other people from different backgrounds – invaluable outcomes but difficult to measure beyond student testimonials.

#### Things we would do differently next time

- Build in more time for exercises and reflection on teamwork and communication across disciplines and different backgrounds; perhaps not have such a wide variation in study level, in other words try to reduce the number of different challenges that teams have to address at once.
- Provide a physical space for the groups to meet and work after the workshops.
- Provide more structured support to all teams to pilot their ideas with real users - half of the teams used the paper prototyping techniques learned during week three of the challenge to test their ideas with other students, whilst the other half continued to rely heavily on desktop research, previous experience of team members and ad-hoc feedback from friends.
- Addressing complex problems through design thinking requires full attention, considerable time commitment and level of energy, which are difficult to find in the evenings when students are already tired after a full day of lectures. It would be ideal to run this programme during the day or during specific times of the academic year when students are on campus but do not have to engage in curriculum activities. When asked whether a weekend programme would be a good idea, participants mentioned they would spend the weekend even more focused on the task and much less on observing and reflecting on their individual and team progress.
- Change the scheduling - Some of the challenges mentioned above could be addressed by running the programme over one week at the beginning of a semester, as part of the induction process or at the start of a new course. The activity can be a good icebreaker to get students more comfortable with working in groups and across disciplines.

## Part 6. The Future

This initiative is part of a much wider process of promoting student agency in relation to curriculum development and design and we hope that in the future, design thinking alongside other 'engaged' approaches like consultancy or live projects will become a normal part of current units. We hope it will be possible to develop a community of practice to share experience and believe that there is enormous scope for these kinds of initiatives to be run in and around the transition periods at the University or as part of the induction process.

### Small things we can do differently starting from today

#### 1. Develop empathy

Talking to someone about your new idea is hard. You've put so much time and energy into it that a piece of negative feedback or even the slightest indifference feels personal. Students will be often tempted to collect feedback for a new idea not to learn more about the potential user, but to confirm they were right all along. This is usually done by sending out anonymous online surveys, asking friends or classmates or relying entirely on desktop research - anything but talking to a real person who might have a real problem.

Here are a few resources to encourage students to talk to real people and learn to see the world from their point of view so they can create better solutions starting from real needs:

- Raise awareness and cultivate empathy through a 90-minute workshop during which students form pairs and design a new wallet. Full instructions and downloadable prints available at the following link: [https://dschool-old.stanford.edu/groups/designresources/wiki/4dbb2/The\\_Wallet\\_Project.html](https://dschool-old.stanford.edu/groups/designresources/wiki/4dbb2/The_Wallet_Project.html)

- Have you ever asked students to interview someone and wished there was a guide on how to run interviews and other field research methods that you could easily share with them? Have a look at <http://www.designkit.org/methods>.
- Do you want your students to use more paper prototyping to share their new ideas before they put more effort into building them? Give them a boost with Stories from SAP available at <https://experience.sap.com/designservices/approach/scenes> .

## 2. Cultivate a growth mindset

There is a famous quote by Reid Hoffman, the founder of LinkedIn, which resonates with some entrepreneurs but can equally be applied to any personal or professional project: 'If you are not embarrassed by the first version of your product, you've launched too late.' Too often students feel the pressure to 'be their best' from day one on campus and discard everything that's short of perfect.

To emphasise responsibility for continuous learning and encourage self-regulating learning, it is important to provide opportunities for students to make mistakes and learn from them prior to a summative assessment.

- New assignment? Give students a few minutes and some props to draw, build or in other ways create the first version of their idea and then present it to others for quick feedback.
- Individual or group presentations throughout the semester? Hand out two types of post-it notes to everyone in the audience and ask them to write one positive aspect and one aspect that needs improvement and then pass the feedback to the presenter.
- Do students work on a real-world problem through iterative feedback loops? Are they aware of the expected initial failure? Are they rewarded for revising their initial approach?

## 3. Facilitate more interactions with the outside world

- Replace a written case study with a guest speaker with whom students can interact during the lecture.
- Talking about a local or global issue? Invite a stakeholder who can share a personal story to bring the issue to life and allow students to ask questions.

## Annex 1



# THE BIG PICTURE CHALLENGE

Imagine and build solutions that matter

## Agenda

WEEK 1			
16 Oct	Event	6.15-8.00pm 8W3.22	<u>Food Waste Realities</u> Students meet with experts in food waste.
18 Oct	Workshop 1	6.15-8.00pm CB3.1	<u>Discover:</u> tools to think and collect information. Form your team. Delivered by: James Rock, Design Thinking expert
WEEK 2			
23 Oct	Workshop 2	6.15-8.00pm CB4.16	<u>Define:</u> use the data you collected to come up with solutions. Delivered by: James Rock, Design Thinking expert
25 Oct	Office Hours	4 – 6pm	Office Hours: ask questions, check with our team about your progress
WEEK 3			
30 Oct	Workshop 3	6.15-8.00pm CB4.16	<u>Build:</u> learn about rapid prototyping techniques Delivered by: James Rock, Design Thinking expert
01 Nov	Feedback session	6– 8pm	<u>Remix and Improve:</u> Teams provide feedback on each other's storyboards in an interactive session. The session is hosted by Apple SouthGate.
WEEK 4			
06 Nov	Workshop 4	6.15-8.00pm CB4.1	<u>How to generate revenue from your idea:</u> alternative business models. Delivered by: prof. Dimo Dimov, Bath School of Management
08 Nov	Pizza Night	6 – 8pm	Informal get-together over some pizza.
WEEK 5			
13 Nov	Workshop 5	6.15-8.00pm CB4.16	<u>How to tell your story:</u> reflect on your experience, draft your final presentation. Delivered by: Catalina Amihaiesi & Henrietta Sherwin

## Annex 2

As part of the application process, students had to answer one question.

Why is it important to you to attend the challenge?
With the recently discovered 12-year window left to curb climate change, our society needs to initiate changes to avoid the life changing effect +1C will have on the environment and people. I strongly believe in the people's power to take steps and contribute to this change as we can no longer only depend on our policy makers. Therefore, I think it is important to take part in the Big Picture Challenge to influence others to take steps in their personal lives, such as reducing food waste. Taking part in this challenge will enable me to positively initiate change in society.
Firstly, I want to learn about food wasting deeply. Because people often think it is conflicted between avoiding food wasting and health diet(do not eat overdue food). Second, I want to learn how to solve a "big" problem step by step. Because I am always taught the "big " problem is far away from common people.
Working within the hospitality industry afforded me an insight into the scale of food waste and changed my perspective on such gross-scale wastage. Furthermore, I am currently working with Danone on a strategy to promote plastic bottle recycling on campus, which has been very rewarding and has developed my interest in sustainability and waste prevention. Additionally, I would love the opportunity to expand on my experience of working on a project and doing so within an inter-disciplinary team. Consequently, I really empathise with this challenge and its objectives, and would be highly committed to successfully completing it with my team.
Creative thinking to solve problems is never a lesson being taught during classes. I've read books about creative thinking but I'd never really had the chance to exercise it in my life. Thus, this will be a perfect opportunity to fulfill my curiosity on how ideas are generated and made feasible in the real world to solve problems as a team, stimulate my mind to see problems differently, as well as be part of drive force in creating a greener and better environment.
Having just finished an MSc in Sustainable Development and an internship in sustainable food production, I have developed insight into and a passion for the challenge presented by this programme. I have just joined the University of Bath therefore this would be an excellent networking opportunity for me, as well as a great way to begin my period of independent PhD study here, by stimulating my creativity and problem solving skills.
With the rapid growth in malnourished population, it is now more than ever that we need to tackle this epidemic. Born and raised, in a developing country like India, where around 10 million people die every year of hunger related diseases, I have always wanted to contribute to bring about a constructive change. Getting this once in a lifetime opportunity would mean being able to work on solutions in a multicultural environment with diverse ideas. This would enable us to work together with fresh perspectives to tackle this global issue.
Considering the accelerated global climate change crisis, it is now, more than ever, important to save resources and create less waste. The UN's recent report highlights the severity of the situation, estimating just 12 years until the Earth's temperature rises above the recommended 1.5C threshold that, if we exceed, will lead to social and economic collapse. Avoiding this requires an urgent and unprecedented transformation of society which everyone must be involved in, especially considering policy makers' inaction. I am excited to take action by exploring the possibilities this challenge will present, and make a meaningful contribution to society.
Throughout my undergraduate degree I have consistently seen my flat mates throwing away food, especially fruits and vegetables, because they believed they were inedible when in fact they were edible. Most people believe that if a banana is slightly brown on the outside that it will most definitely be brown on the inside. I think a starting point here is educating people about food and its longevity. The Big Picture Challenge provides an incredible platform to truly create

<p>awareness about food waste and most importantly provides us with the resources to make an impact and reduce food waste.</p>
<p>Food wastage upsets me. Our ultimate priorities as a population are our people and our environment, both currently affected by avoidable food waste. I would like to work with like-minded passionate students to explore innovative methods to address food wastage at all stages. I am pursuing a career that blends my two main strengths: creativity and science, and working on The Big Picture Challenge is a great opportunity to put my strengths to work. Having enjoyed my Plant Biotechnology module, I chose to pursue modules that will benefit the challenge; Conservation Biology, Plant Biotechnology &amp; Environment and Business Strategy.</p>
<p>The problem of food waste is something I have become increasingly aware of in recent years, especially while working in the restaurant and events industry. It was eye opening and scary to see the amount of food that was dumped at the end of every work day. I now try very cautiously to reduce food waste in my daily life, but the impact on the overall problem is very limited. The big picture challenge would be an amazing learning opportunity, that would also give me the chance to get actively involved in finding a solution to such an important issue.</p>
<p>Food waste surely is a serious public problem that always worrying for me. I am thinking that if I could participate in this challenge, I may do my best to change even a little bit and maybe make our home a better place. Secondly, I am keen to have such experience to cooperate with others and to work hard on a 'real'problems, that would be one of the best ways to improve my confidence and make like-minded friends.</p>
<p>A lot of people are suffering hunger and died by malnutrition. However, there still lots of people waste food, especially students in the university. To join this challenge, I hope I can learn how to tackle food waste and let more students know the importance of saving food.</p>
<p>Speaking of environmental protection and sustainability, most of the people will consider water pollution or deforestation but the minority of them will realize food waste is an serious problem which is affecting our planet. Basing on the situation in China, especially in my university, countless leftovers are dumped into rubbish bins and no one cares about that. Recently, TESCO has removed 'best before' labelling from fresh products to tackle this problem. I'm really interested in this situation and want to bring some good ideas to allocate the importance of caring environment from a small step in our daily life.</p>
<p>With an increasing worldwide population, water and food scarcity are set to increase, making food wastage a serious issue that must be addressed. Through my part-time work at the University's LimeTree eatery, I have witnessed the vast amount of daily food wastage, as well as the current measures in place aiming to reduce this. I have a passion for the environment and would love this opportunity to work with a multi-disciplinary team with the aim of combating this issue. The chance to learn more about the local community and the process of "Design Thinking", would prove to be invaluable.</p>
<p>It is important for me as Food Waste is a big issue nowadays. It leads to major consequences on the environmental, economic, and social levels. Everyone should be involved in reducing this waste as the world population is growing and we do not have the resources for everyone. The resources of Earth are not inexhaustible and must be saved by all means. I also did my thesis of my undergraduate studies on zero waste, and its effects on the economy. I learned a lot thanks to that thesis and I intend to put my knowledge and work in this challenge.</p>
<p>I plan to start my own business and I want to learn more about how I can include social entrepreneurship within it. The BPC is the perfect opportunity to explore the realities of tackling social problems, learn what social entrepreneurship is like in practice, and gain feedback about potential solutions, strategy, and business models. I believe that food waste is a very important issue. I would like to learn more about it to find solutions that help the environment and also local communities to tackle poverty and homelessness.</p>
<p>Food waste and other environmental challenges have always been important to me. I have participated in other challenges such as the Hult Prize, which was held in my previous University in 2017. Also, I participated in the elaboration of a food-recycle restaurant's (in France) business plan. I am very attentive to food safety and waste. I live on a vegetarian and low-waste lifestyle. I have many ideas I would like to share and work on with a team, sharing same values. I believe this topic can lead to some very interesting opportunities to build efficient and long lasting projects.</p>
<p>I feel strongly that food wastage is one of the largest problems in the western world. While many developing countries still struggle to feed their entire populations, it is shocking to realise the recklessness with which we take our food for granted. I also feel it is important to acknowledge issues closer to home, moving to a city last year I was shocked by the levels of homelessness in Bath. I feel a personal responsibility to help design innovative solutions to aid in the redistribution of food to better benefit all people within the community.</p>
<p>My interests in the environment and food waste are evident in my passion for promoting Vegetarianism through my role as Publicity Officer in Vegetarian Society. This originated during my work as a waitress in a restaurant in Hong Kong and in the Sports Café at Bath University whereby food is wasted every day. Despite my belief against food waste, small businesses are unable to retain or recycle food due to health and safety reasons. I am therefore interested in finding a sustainable solution to food waste that can be applied to big as well as small businesses.</p>
<p>I am really excited by the Challenge. I would look forward to working with like minded people, who study different subjects and have different skills, on a interesting and important project. I have a lot of energy and care for this topic</p>

since I am very environmentally conscious, trying to live as sustainably and responsibly as possible. I thrive in a team and value any opportunity to do this. I would enjoy collaborating with everyone and learning entrepreneurial skills, whilst learning more about developments in tackling the food waste issue, a global issue that is paramount we engage with.

A podcast recently taught me that if food waste were a country it would be the third largest emitter of greenhouse gases, as a statistic that's pretty hard to ignore. That night, when throwing out my slightly yellowing broccoli I couldn't help feeling guilty but at the same time hopeless. While I knew I was adding to the food waste issue I didn't know what options I had or what to do differently in the future. Working in a team to try and tackle this problem, in even the smallest way, is an opportunity I would love to have.

Food waste is a major problem of our society. It is appalling how much food is thrown away, and secondary, the energy and cost of food production and packaging. Personally, I make every effort to avoid food waste. However, as conscientious as I may be, I am one person. No matter my efforts, I cannot achieve the effect that I could in working in a project to influence others behaviour. I would like to make a difference.

Further, I would like to develop skills in project management and extend my capacities beyond those of my degree.

Chemical-Engineering is a course based around three industries: energy, pharmaceuticals and food/water. While the first two don't particularly spike my interest, the food/water industry is somewhere I can see myself (not only because I'm undertaking a research project at the University of Auckland from February 2019, regarding the treatment of waste-water).

Having worked in a local cafe and a national supermarket I've seen waste food on different scales. Although I tried to reduce this (by donating to local businesses) I felt a UK wide scheme would be the solution. This project would give me the opportunity to help develop one.

It is true that the food waste problem is spreading to all countries. In my hometown, Thailand, also facing with the same situation, and the government is still looking for alternatives to eliminate them. Therefore, I would like to be chosen to participate in this campaign so that I can see different aspects from many people, exchange experiences regarding this issue, like success and failure, and help initiating the suitable and possible solutions. Additionally, this would be a great opportunity to earn new experiences and challenges, enhance my abilities, and improve my skills under the guidance of experts.

Being able to make beneficial changes to the worrying current state of the environment is one of the main reasons I applied for my course. Plastic waste was something I mentioned in my University application as I am always astonished at the amount of plastic packaging used for all fruits and vegetables in the UK. I have always felt strongly that there must be another more sustainable way to package food and other consumer goods, while still being cost effective. To be part of a project that aims to solve the plastic issue and to work with others who feel as strongly as I do would be a great privilege and I would love the opportunity to take part.

I began studying psychology as I am fascinated by behaviour change. The way in which organisations, such as the 'Behavioural Insights Team', are able to utilise psychology to enact pro-social behaviour change is simply phenomenal. Personally, I would love to be involved in a team using elements of psychology to tackle big issues such as food waste (over 8 million UK citizens struggle to afford food, whilst nearly 2 million tonnes of food are thrown away per year!). In addition, I would hope to learn valuable skills, such as working effectively in groups, and more generally improving my confidence.

I am passionate about reducing food waste and currently volunteer at Foodcycle, a charity that uses surplus food from supermarkets to prepare and cook a meal for people in food poverty. I would like to increase my interest into reducing food waste and work with like-minded individuals in developing ideas to combat this issue.

Some poor people cannot buy food to eat and many others waste it putting it into the rubbish bins. I want to persuade people to stop this action and I believe that I have the appropriate skills for this challenge. I am a social and reliable person with organizational and collaborative skills and I would like to be a member of this team. I want to share my knowledge with my team and to help to success in this challenge.

I have had first-hand experience in witnessing gross amounts of food go to waste, however neglected any initiative to take action against food waste habits. Furthermore, I have a keen interest in the neuroeconomics behind decision-making, and am vastly intrigued by nuanced environmental features / policy changes that can make huge positive differences in curbing food wasting behaviours. I believe that The Big Picture Challenge is the perfect opportunity to have a long-lasting positive impact on the community, stretching my abilities to think innovatively, creatively and practically whilst honing my team-working, organisation and leadership skills.

getting the chances to interact with diverse fellow students group and learn from each others.

The Big Picture challenge is an opportunity for me to enhance my professional skills, as much as be able to apply theories into practice. Being part of this Challenge is important because I am passionate about sustainability and marketing field. Thus, I believe I can make a consistent contribution to the topic and enhance my academic background. Another point that should be addressed is that food waste and sustainable market are themes being highlighted, raising



its importance to discussions. Saying that, I want to be part of the change contributing to solving issues our society is currently facing.

Since the young age I was interested in technological advancements, which allow the humanity to develop and reach unreachable goals. It was always the forward-thinking people, like Steve Jobs, who had incredibly unique and innovative solutions to deliver maximum efficiency and creativity to the product. This is why Apple is one of the world leaders in tackling waste by producing efficient phone recycling machines and powering of Apple Park with 100 % renewable energy. Nowadays, sustainability and waste management key to tackling climate change, which are a goal for this project as well. The issue is truly global and needs to be tackled by a team of enthusiasts, which I want to be a part of. I hope, that I can share my expertise and develop myself during this project, which could be a small step to tackling the climate change.

I really want to take part in this challenge because I think food waste is such a big problem and that new solutions should be found to tackle this issue. I am particularly interested in the psychology behind peoples tendency to waste food and how certain campaigns and products may be able to change this behaviour on a more permanent basis or how a change in social policy may also lead to less food waste (such as a way of donating unwanted food to homeless charities). I also want to get involved in this challenge to build my confidence and to develop new skills such as cooperation and innovative thinking as well as building relationships with people from other departments; it would be interested to see there viewpoints on how to tackle this rising problem of modern society.

I've always hated waste. I become a hoarder until I'm able to give away my things to someone who can use them better than I can. Food waste is also a huge issue in my country (Oman) where we're attempting to tackle this problem by the local communities such as mosques installing fridges so that the public can donate extra food to the less fortunate. It's important to me to be part of the challenge as I am passionate about this cause and I feel I have a lot to offer to create an innovative idea to tackle this problem.

As part of my second year of study, I delivered a presentation about the recent advancements in 3D printed food. I concluded that additive manufacturing has the potential to solve many of the industry's problems. 3D printing food at home would reduce food miles and food waste. I was delighted to hear about this challenge because it would be a great opportunity to voice these ideas. With aspirations to undertake a placement year in the food industry, this experience would prepare me to a more valuable intern as I would have a deeper understanding of the challenges the sector faces.

It is important to me that I participate in The Big Picture Challenge for the following two reasons:

1. As a member of the Circular Economy Club, a student of Sustainability and Management, and a decent human being concerned about the future of the planet, I want to apply the principles of the Circular Economy to reducing food waste.
2. The structure of the Challenge: Ranging from team set-ups to workshops and the chance to work with industry experts, the Challenge will give me the opportunity to develop an idea that can make life better in myriad ways.

I want to learn more practical skills and find the solution of social problems in business way is what I am interested in.

Through my course, I have spent a lot of time studying waste management, and the principles used to solve these issues; I have a strong desire to get involved in the development of local/regional solutions surrounding these problems and this seems like a very well-tailored opportunity to explore these concepts and develop core skills relating to these industries.

The indisputable fact that the world is on an unsustainable path is evident. By generating sustainable alternative products, schemes and ideas that tackle food waste, we can help shift the world to a better future. I will always continue to take as many steps as I personally can to help motivate the world to a more sustainable food future, but I believe the solution to having a meaningful impact is through initiatives such as TheBig Picture Challenge. I have experience in the field of food waste innovation (references available on request) and I believe I have a lot to offer my team.

Sustainability has been an important area of focus in my degree, from studying about increasing reactor efficiency to the use of novel reaction mechanisms to reduce waste production. However, these concepts feel quite abstract and I am excited to apply their principles to a problem that I encounter in everyday life such as food waste. I want to be part of the Big Picture Challenge because I want to push myself to think of new and practical ideas outside of the engineering sphere, and I am excited to collaborate with students from other disciplines who have different ways of thinking.

I like coming up with solutions based on experiences across various industries.

The problem of food waste is important for us to solve nowadays. I am from a country where there is much food waste and lack of food all the time. I have desire to learn more concerning the problem and try my best to think about the solutions. I also want to improve my ability of teamwork and being leader. I have interest in working with people from different backgrounds, which would help me to learn various thinking patterns. These are the reasons why I want to participate in the challenge.

Our society is built on a consumerist and capitalist mind-set that doesn't take into account any minorities and is capital based. The majority of the population isn't part of this group. Struggling economies groups and countries aren't taken into consideration when planning for socio-economic change. I would love to help any community struggling with food insecurity alongside reducing food waste and increase awareness on production on a local scale.

This challenge will be a great opportunity for me to enhance my skills and express my ideas. I have always wanted to be a part of a project that deals with sustainability and this is a great opportunity. It will help me think outside the box, meet new people and understand how it is like to work in teams while sharing knowledge with each other and being supportive. Learnings from my degree can be applied and I can see to myself how well that can be done. Also I have completed CIMA, this would help me apply the knowledge I obtained through that to come up with a cost effective approach to reduce food waste. Last but not least I feel that it is one's duty to protect the future and take action to do so.

I live in India, where people suffering from malnutrition are very easy to find at every street corner. I often wonder often how much would change if we just started saving our food, not wasting it. The Big Picture Challenge is one way I may be able to actually make a difference in my University at the very least, and I may be able to apply the ideas back home in India as well.

I want to make an effort to this global issues about food wasting and it's also a great opportunity to learn from it, meet new people, develop many skills that will benefit my life. And it's really amazing that you can put your ideas into action and see it may affect the world.

It is important for me to be a part of The Big Picture Challenge because it offers an opportunity to not only help me grow personally and socially but also allows me to contribute to the community and encourage other students as well as the society to act responsibly and reduce food wastage. Thus, hopefully gain a sense of gratitude and appreciation while helping to provide and satisfy the basic needs of those who truly deserve it.

I am very passionate about food waste and trying to limit this as far as possible. I can see first-hand how perfectly edible food is wasted, or individuals over-buy and then have to throw away food they haven't had time to eat. As a budding psychologist I am eager to be able to see how my skills can be applied in changing people's attitudes to an issue such as this, while at the same time hoping to really make a difference for our environment.

As a Process Engineer in the food industry, I was shocked to see the daily volumes of food waste, and I would really like to do something to address this. This challenge will harness my engineering skills to create tangible social impact whilst developing my commercial awareness. As an aspiring Environmental Consultant, I am particularly excited to learn about Design Thinking from industry experts. I am keen to use my presentation skills and student-network collaborations to pitch our idea and assess user-interaction. Finally, this immersive learning experience will help me develop an entrepreneurial mind-set as I enter the working world.

I care about human's wellness. I would like to meet more people from different departments and know their experiences as well.

I think food waste is a serious problem in the world because it creates a lot of unnecessary carbon footprint. I want to be a part of the big picture challenge because it gives me opportunities to think of a new solution to tackle this problem and gain some practical experience by developing a new business model. I can also get to know more people from different backgrounds and cooperate with them. Furthermore, I can learn a new problem-solving skill, which is the design thinking from an innovative company. I think this experience will be useful for my future career.

There are many tough challenges facing modern society, however I feel that one of the less talked about and arguably humanities 'stupidest' problem is in fact food waste. The fact there is so much wasted by so many perplexes me greatly and I would like to be part of the immensely positive impact that could be achieved from the unique work of the student body on this project. This is a valuable opportunity to offer a meaningful solution that would benefit the wider community whilst allowing myself and like-minded individuals to challenge ourselves and step outside our comfort zones.

A great opportunity for me to develop keys skills: communication, collaboration and innovation. Having a exciting focal point to discuss with fellow students will show me what it's like in the real world to collaborate with strangers to achieve. Working with expert guidance is fantastic motivation to operate at the best of my abilities. I chose to do mechanical engineering in order to design and create in teams using our own ideas; to do this while exploring business, industry and my locality is brilliant. This is especially true being a fresher as it will provide invaluable experience for future projects.

1. Food waste is a serious existing problem and is hard to solve in the practice. I really look forward to working out fresh ideas through working with people from different backgrounds.

2. It is an excellent opportunity to get instructions from experienced tutors and keep improving myself with global awareness and out-of-box thinking. It's important to know how to put our thoughts into practical life.

I have these reasons below. 1. Work with people from different countries and different majors which can make this challenge more interesting and reasonable. 2. Get more practical skills and learn more new knowledge instead of just management. 3. Learn to concern on news and issues lately and open our mind via brainstorm.

## Annex 3

### The Big Picture Challenge Demographics Report

Total number of individual members		<b>38</b>
<b>SEX</b>		
Sex	<b>Members</b>	<b>% of sample</b>
Female	29	76.32%
Male	8	21.05%
(Data not current)	1	2.63%
<b>COURSE NAME</b>		
Name of University course	<b>Members</b>	<b>% of sample</b>
MEng (hons) Chem Eng	5	13.16%
MSc Entprshp & Mang	5	13.16%
MEng (hons) Chem Eng w Plcmt	5	13.16%
BSc (hons) Psyc	4	10.53%
BSc (hons) Biol w Prof Plcmt	2	5.26%
MSc Sustainability & Mang	2	5.26%
BSc (hons) Biomed Sci w Prof Plt	2	5.26%
MSc Fin w Rsk Mn	1	2.63%
BSc (hons) Int Mang	1	2.63%
MSc Marketing	1	2.63%
MSci (hons) Psyc	1	2.63%
MSc Int Dev, Soc Justice & Sustainability	1	2.63%
BSc (hons) Social Scis w Plcmt	1	2.63%
(Data not current)	1	2.63%
MSc Engineering Bus Mang	1	2.63%
BSc (hons) Sociol w Plcmt	1	2.63%
MSc Mang	1	2.63%
MSc Finance	1	2.63%
BSc (hons) Management w Mktg w plcmt	1	2.63%
PhD Res in Arch	1	2.63%
<b>MODE OF STUDY</b>		

Full-time, part-time etc	Members	% of sample
Full-time	37	97.37%
(Data not current)	1	2.63%
<b>FEES STATUS</b>		
Fees status	Members	% of sample
Home	18	47.37%
Overseas	14	36.84%
Europe	5	13.16%
(Data not current)	1	2.63%
<b>STUDENT TYPE</b>		
Undergraduate, postgraduate, etc	Members	% of sample
Undergraduate	23	60.53%
Postgraduate Taught	13	34.21%
(Data not current)	1	2.63%
Postgraduate Research	1	2.63%
<b>EXP END DATE</b>		
Expected end date / year of course	Members	% of sample
2019	20	52.63%
2021	9	23.68%
2022	6	15.79%
2020	2	5.26%
(Data not current)	1	2.63%
<b>DEPARTMENT</b>		
Name of University department	Members	% of sample
Management	13	34.21%
Chemical Engineering	10	26.32%
Psychology	5	13.16%
Biology & Biochemistry	4	10.53%
Social & Policy Sciences	3	7.89%
(Data not current)	1	2.63%
Mechanical Engineering	1	2.63%
Architecture & Civil Engineering	1	2.63%
<b>FACULTY</b>		
Name of University faculty	Members	% of sample
School of Management	13	34.21%
Faculty of Engineering & Design	12	31.58%
Faculty of Humanities & Social Sciences	8	21.05%
Faculty of Science	4	10.53%
(Data not current)	1	2.63%
<b>YEAR OF STUDY</b>		
Number indicating the year of study	Members	% of sample

1	18	47.37%
2	8	21.05%
3	5	13.16%
4	4	10.53%
5	2	5.26%
(Data not current)	1	2.63%

## Annex 4

### Attendance to weekly activities for each team.

	Team 1 - RT3	Faculty/Department	Level of study	Year	Kick-off event	W 1	W 2	W 3	Remix and Improve'	W4	Pizza night	W 5	Presentation
1	BSc (hons) Social Sciences	HSS	UG	2									
2	MSc Engineering Business Management	Engineering & Design	PG	1									
3	MSc Management	School of Management	PG	1									
4	MEng (hons) Chemical Engineering	Engineering & Design	UG	1									
5	PhD Research Programme in Architecture	Engineering & Design	PhD	1									
6	MEng (hons) Chemical Engineering	Engineering & Design	UG	3									
7	BSc (hons) Sociology	HSS	UG	2									
Team 2 - FWC													
8	MSc Entrepreneurship and Management	School of Management	PG	1									
9	BSc (hons) Biology with Professional Placement	Science	UG	4									
10	International Management	School of Management	UG	2									
11	BSc (hons) Psychology	HSS	UG	1									
12	MSc Entrepreneurship	School of Management	PG	1									
13	MSc Entrepreneurship and Management	School of Management	PG	1									

Team 3 - PREP													
14	MEng (hons) Chemical Engineering	Engineering & Design	UG	3									
15	MSc Sustainability and Management	School of Management	PG	1									
16	MSc Entrepreneurship and Management	School of Management	PG	1									
17	MSc International Development, Social Justice and Sustainability	HSS	PG	1									
18	BSc (hons) Biology with Professional Placement	Science	UG	2									
19	BSc (hons) Psychology	HSS	UG	2									
20	MEng (hons) Chemical Engineering	Engineering & Design	UG	2									
Team 4 - FRESH THOUGHTS													
21	BSc (hons) Management with Marketing	School of Management	UG	4									
22	BSc (hons) Biomedical Sciences with Professional Placement	Science	UG	4									
23	MEng (hons) Chemical Engineering	Engineering & Design	UG	3									
24	MSc Entrepreneurship and Management	School of Management	PG	1									
25	MEng (hons) Chemical Engineering	Engineering & Design	UG	2									
26	BSc (hons) Psychology	HSS	UG	4									
27	BSc (hons) Biomedical Sciences with Professional Placement	Science	UG	2									
Team 5 - THE REMAINERS													
28	MSc Finance with Risk Management	School of Management	PG	1									
29	BSc (hons) Psychology	HSS	UG	3									

30	MBA	School of Management	PG	2										
31	MSc Marketing	School of Management	PG	1										
32	MEng (hons) Chemical Engineering	Engineering & Design	UG	5										
Team 6 - UNITE														
33	MEng (hons) Chemical Engineering	Engineering & Design	UG	1										
34	MSci (hons) Psychology	HSS	UG	1										
35	MEng (hons) Chemical Engineering	Engineering & Design	UG	5										
36	MEng (hons) Chemical Engineering	Engineering & Design	UG	3										
37	MSc Sustainability and Management	School of Management	PG	1										
38	MSc Finance	School of Management	PG	1										



# PERSONAL

Protecting ideas

Learned how to produce a stakeholder map! ☺

Developed an awareness of the size of food waste.

Learned how to work with people all over.

Developed tools to use for design thinking.

**Learned**  
Forming idea frameworks

LEARNED  
Better at speaking in front of a group.

I love working with people - encouraged earlier

Better understand understanding of British culture

Being more patient

coordination & creativity

giving ideas to the group

**PERSISTENCE**  
Low risk design thinking tool, as well with different people, use unique group work ideas.

Think deeply + explain my ideas clearly

I learned how to be creative, innovative & work as a team ☺

public speaking

sharing & communicating with people from + background.

**Teamwork**

Thinking more about how to present my thoughts more clearly.

**PATIENCE AND UNDERSTANDING WHEN YOU ARE WRONG**

Talking in a group

Brainstorm to Practice

generate ideas

learned abt design thinking

**COLLABORATION**

Systematic thinking (you get better)

Bad ideas can be good starting points

Fast brainstorming & execution of ideas

**BRAINSTORMING TECHNIQUES**

# TEAM

Team  
Diverse/  
Enthusiasm

**BIG DIFFERENCES CREATE GREAT OUTCOMES**

Managed to go from a huge problem to a solution we can be proud of ☺

**TEAM**  
Communicate + work together despite differing schedules.

**Collaboration**

working as a whole (team) towards the same goal.

selecting ideas and turning them into a start up P.H.

**Cooperation**

growing from each other's ideas / focusing our ideas

**TEAM PREP**  
... did well to come back to the core features of the product and targets of the product.

communication is key!

**adaptability**

**PRIORITIZATION**

challenges each other

**NOT A EASY ONE, BUT we made it.**

**COMPROMISE**

Building on each others ideas

**No data is stupid - learn cause & effect of ideas**

any idea can be good if you can justify it.

1 thing for team  
Nice team & good performance every time.  
Thank you. ☺

**collaboration**

Critiquing each others ideas

how well (should) worked together (period) towards a common goal?

