DESIGNATHON WORKS PRESENTS:

GLOBAL VOICES OF THE NEXT GENERATION

FOOD & CLIMATE ACTION

November,

2019

Global Voices of the Next Generation:
‘Food & Climate Action’

By Designathon Works

Global Voices of the Next Generation is a research initiative linked to the Global Children's Designathon. The initiative researches the knowledge and opinions of children in 28 cities worldwide on climate change and related issues.

The Global Children's Designathon is the annual event of non-profit organisation Designathon Works. The event encourages children from all over the world to think about environmental problems and to design and build their own inventions to prevent these problems locally or globally.

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This report benefited from the contribution of Akanksha Bapna and Namrata Sharma from Evaldesign, whom expertly designed the tools needed to conduct this research. This research would never have happened on this scale without them.
This report also benefited from the vital input of Anuj Mali from PWC, who brought this research to the next level.

Designathon Works is a non-profit organisation based in Amsterdam, the Netherlands. Its mission is to empower children to design a better future.

By Designathon Works

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FOREWORD

We are at a turning point in human history. The current generation in leading positions has the power to sign global treaties and to introduce better laws to stop the degradation of this planet. They need to find wisdom to make decisions that result in sustaining life on this planet, and they need to do it now.

However, children and youth are also eligible inhabitants on this planet. They might not have the age needed to vote according to nation states' laws, but they can participate and be active in building a sustainable world. They have life experiences and perspectives that societies can benefit from. Most of all, they often have the tendency of thinking "outside of the box", and that is why in saving this planet we cannot afford to ignore them. We must support children and youth in finding their power, building their skills and realising their visions. And that is where high quality education comes in. In the 21st century, especially environmental education has an important role to play.

The Global Children's Designathon is environmental education at its best: it is learner focused, it builds skills and empowers learners, and it brings individuals together to tackle challenges collectively. By encouraging children to find their innovative skills and help them to develop them, the Designathon method can be considered a long-term investment for change.

World Wide Fund For Nature is an independent conservation organisation, with a mission to stop the degradation of the Earth's natural environment and to build a future in which humans live in harmony with nature. Innovations are at the heart of WWF, and by taking part in the Global Children's Designathon 2019, WWF wanted to provide the opportunity to children to apply their great creative capacity to conservation. This report shows that it was worth it. We are proud to introduce participants' thoughts, innovations and real-world ideas around this year's theme: Food and Climate Action.

In 2020, many global treaties will come to the point of assessment. I hope that global leaders will take a while to listen to our children and youth's views and to put thought into it. This report opens an opportunity for that. Only by listening deeply, being inclusive and working together in different stages of life, we will reach sustainability.

Hanna Seimola

Global Education Leadership Group,
WWF Network

ACKNOWLEDGEMENTS

First of all we want to thank all 1,200 participating children! Without their participation we would not have been able to capture their fascinating voices and ideas. Secondly, we owe a big THANK YOU to all of our 40 Global Children's Designathon hosts and their teams! Thanks to these 300 wonderful people we could yet again reach children from all over the world and provide them with a valuable experience.

This research report has been made possible thanks to the support of our partners PwC and Evaldesign:

PwC

Under the inspiring leadership of Ragnar van der Valk, PwC offered their generous help in creating this version of the report. Anuj Mali (PwC) helped us with several elements such as advising on the preparation of a reusable questionnaire, drawing up hypotheses, performing data analysis on all data collected during the GCD2019, and finding cross-links in existing research sources. We are very grateful for all the hard work and assistance in taking this research report to the next level.

Evaldesign

Eval Design, an Education Research Firm set up in 2013 with a focus on designing and evaluating educational programmes to improve student outcomes, played a significant role in understanding the impact of the GCD 2019. Akanksha Bapna and her team provided high quality consulting on impact assessments. They also developed tools for the children and facilitators that assess the impact on content knowledge around the GCD theme, as well as the impact on 21st-century skills related to the design-thinking cycle. This has led to an amazing collection of data across the globe, which they analysed and visualised for this report. We are very grateful to work with such a professional organisation that helped us develop an even more in-depth version of this third report.

Furthermore, there would be no GCD without the help of our trusted partners and funders, who each in their own way support Designathon Works and the GCD. Their support ensures the annual recurrence of the event and allows children's voices to be heard, not just in the Netherlands but around the world. A special thank you goes out to WWF. WWF has been a big supporter of the GCD 2019 in designing the theme and in the organisation of the event with ten of their local offices, thanks to the vision and effort Hanna Seimola (Global Head of Education WWF) put into this project.

Lastly, this report is made possible by four brilliant individuals who have been working relentlessly on the research set-up, the ethnographic execution, the data analysis, the design and content of the report: Anuj Mali (PwC), Akanksha Bapna (Evaldesign), Isabel Brenner (Designathon Works) and Eline Karlas (Designathon Works).

ABBREVIATIONS

DW	Designathon Works
GCD	Global Children's Designathon
HDI	Human Development Index
PwC	PricewaterhouseCoopers
SDG	Sustainable Development Goals
UN	United Nations
WWF	World Wide Fund for Nature
WEF	World Economic Forum

Zagreb

EXECUTIVE SUMMARY

Over the last few years it has become evident that not only adults are able to ignite change: young people have shown a huge concern for social and environmental issues and are increasingly taking part in the debate. As adults, we have a duty to provide these children with an opportunity to join in, by empowering them to take action and by preparing them to prosper in our rapidly changing, technological and globalised world. But most of all, it is necessary to listen to them.

For the past six years Designathon Works has been advocating a radical reimagining of how society sees children and their role in society. What if we saw children as changemakers, as engaged humans, as activists, as campaigners, scientists or inventors, and then helped them to develop their passion and abilities for these roles? We work on building the inner capacities of all children, regardless of their gender, country of origin, class, skill or learning situation.

The annual Global Children's Designathon (GCD), initiated in 2014, is a day dedicated to celebrating what the world could be like when children are put in charge of designing better futures for people and planet using new technologies. The GCD is also a call for changemaker education on a global scale. On this day, children in cities all over the world work simultaneously on developing their own ideas and building prototypes. The 2019 theme revolved around the connection between food production and consumption and their influence on the world's climate. Sub-themes were loss of biodiversity, hunger, greenhouse gas emissions and food waste. The challenge proposed to the children was: "How can we produce food for everyone and treat the planet well?".

The Global Children's Designathon 2019 was also the breeding ground for a third edition of research on the global voices of the next generation. This year's event created an opportunity to listen to the voices of over 1,200 children worldwide, about their concerns and solutions to food and climate problems. Through a questionnaire among 883 children with different geographical and socioeconomic backgrounds, we were able to identify children's perceptions of the issues and how these are handled, how children's attitudes relate to their ability to be a changemaker, and what children propose as solutions to these problems. This report elaborates on the findings that emerged from a global-scale research and showcases more than 100 inventions designed by children aged 7-12.

The main research question answered in this report is: **"How capable and engaged are young people across the globe to solve complex problems around food and the climate?"**.

10 Key Findings

The main messages of the Global Voices of the Next Generation on: Food and Climate Action research are summarised in the following ten key findings:

1. Approximately 70% of the participating children in the Global Children's Designathon 2019 indicate that they are very worried about the world's food and climate problems. Level of concern appears unrelated to the country of origin and how well this country is performing on SDG progress, with a high level of concern reported in all participating countries.
2. Children feel a sense of frustration when it comes to adults' sense of responsibility to take on food and climate issues. The common belief among children is that adults are not as worried as children are, and not enough is being done by adults to tackle these issues.
3. Children indicate that their primary motivation to participate in the event is based on the desire to find a solution or tackle a problem. Another motivation is the desire to learn and develop skills. This shows that children are highly motivated to make the world a better place, as well as eager to learn.
4. Children from highly developed countries are inclined to link food and climate issues to less developed countries and marginalised people. In contrast, children from a lower Human Development Index (HDI) group identify children in general as the most likely victims of climate change.
5. Our research finds a statistically significant improvement in children's knowledge and confidence scores after the event. This validates the effectiveness of climate education and the Designathon Method.
6. The research shows a correlation between empathy levels and a sense of worry. Additionally, children proved capable of inventing and designing solutions for people with a different geographical background to their own, showing empathic abilities to think beyond the boundaries of their immediate surroundings.
7. Over 90% of the children express that they enjoyed working in teams. A common opinion heard during the day was the added value of a design team over individual work.
8. Out of all children, 80% indicate that they managed to finish the goal they had set for themselves.
9. Children from Abuja, Accra, Geneva and Amsterdam score highest on changemaking ability. This ability is measured as the sum of the level of concern, empathy, self-confidence and collaboration scores.
10. Through the design method children learned to identify root causes of climate issues. An important shift is measured from children's initial goal to tackle climate change as a whole, prior to the event, with a significant amount of children adjusting this goal to a more tangible root cause. It is an important part of the Designathon Method to educate children on the long-term benefits of prioritising the tackling of causes over solving consequences.

The findings show that children have great changemaker abilities and are intrinsically motivated to solve problems and contribute positively to the world. We therefore believe that children should be included as an important stakeholder in discussions and decisions pertaining to global environmental and social issues. We, as a society, should start empowering children to reach their full potential as agents for positive change by giving them a prominent place during discussions on global problems. Furthermore, we need to educate our children in how to deal with less predictable and very complex futures by focusing on capabilities in parallel with knowledge acquisition, by including 21st-century skills in educational systems around the world.

PART 1: INTRODUCTION

CHAPTER 1: INTRODUCTION

Global Children's Designathon at a glance

Johannesburg

CHAPTER 1: INTRODUCTION

As a result of the practices that have created our interconnected and technologically advanced world, we are facing challenges such as global warming, food shortages, extreme droughts and loss of biodiversity. Examples of root causes of these challenges include exploitation of the planet's resources, our throw-away consumer lifestyles and the form of capitalism we practice throughout the world. These problems and challenges have been high on the agenda lately because of their pressing nature. It is undeniable that we have to take action in order to change our current practices today to more sustainable ones. This is a great challenge, especially in our rapidly changing, complex world.

Over the last few years it became evident that not only adults are able to ignite change: young people have shown a huge concern about social and environmental issues and are increasingly taking part in the debate. A great example of this is the Fridays for Future movement, initiated by the Swedish Greta Thunberg at only 15 years old (Fridays for Future, n.d., 1). In total, already 13 million children have participated in climate strikes, and this number continues to grow every week (Fridays for Future, n.d. 2). Movements sparked by young people are not limited to activism, however. Some changemakers have seen or experienced the problems facing our planet first-hand and have been inspired by that encounter to drive innovation. One example is Dutch innovator Boyan Slat, who at the age of 18 founded The Ocean Clean-up, an organisation that develops technologies to "rid the world's oceans of plastic" (The Ocean Cleanup, n.d.). These examples are just a couple of the many which show that young people are capable of using their creativity and imagination to find solutions to complex problems.

Inspired by the impact of these young changemakers, this year's World Economic Forum made a powerful statement by recognising the power of young people as a force for change. The voices of young changemakers such as Melati Wijsen (19) and Naomi Wadler (13) were given a prominent space on stage throughout the event. Seeing young people as active stakeholders in their own futures is something we, at Designathon Works, have been actively advocating for the past 6 years. What if we saw children as changemakers, engaged humans, activists, campaigners, scientists or inventors, and then helped them to develop their abilities to fulfil these roles? Movements such as Fridays for Future are very valuable to do so, however, we need to look farther. We need to educate children and young people on how to deal with less predictable and more complex futures. We need to teach them abilities to deal with social, economic and environmental challenges that go way beyond striking.

That is why Designathon Works has designed a unique educational method which places the child at the heart of the process and is based around design thinking and children's natural interest in technology. During a design hackathon (a Designathon), children invent, build and present their self-devised solutions to a social or environmental problem pertaining to the Sustainable Development Goals as set by the United Nations. By starting to implement this teaching method with children as young as 7 years old, children have the opportunity to get an early start on developing, and discovering, their abilities as changemakers.

Unlocking the changemakers in children worldwide is not enough to cause a change in the global narrative. What sets apart the impact of people like Greta Thunberg and Boyan Slat is the scale of their reach, fuelled by amplification of their voices and ideas. Amplification of the voices of young people has also been the main motivation behind launching our research initiative and writing the previous two editions of the "Global Voices of the Next Generation" reports (2018: Deforestation, 2017: Water). With an ever-growing list of participating children as well as more countries than ever before, the 2019 report promises to show even more insight into the minds of children from all over the world. In November 2019, during our annual global event called the Global Children's Designathon, we asked 1.200 children for their opinions and thoughts on the problems around this year's theme Food and Climate Action (see GCD at a glance page 17). The GCD was the breeding ground for the research described in this report and enabled us to reach out to children from all around the globe (see GCD at a glance page 16). The overarching question our research answers is:

"How capable and engaged are young people across the globe to solve complex issues around food and the climate?"

This question helps us show the world why children should be included in finding solutions to the problems we are facing today. In order to answer this question, the following sub-questions are answered:

1. What is children's perception of the problems around food and climate change and how these are handled?
2. How do children's attitudes relate to the ability to be an active agent of change (a changemaker)?
3. What do children propose as solutions to food and climate related issues?

By showing the results of this research to the world, we aim to amplify the children's voices to the masses, in order to increase their reach as well. We believe many more children have the potential to be changemakers like Greta and Boyan, when given an audience that is willing to listen.

MEET YOUNG CHANGEMAKERS THAT INSPIRE US

Source: twitter.com

AYAKHA MELITHAFA (17)

“We have a couple of demands for our government and one of them is having a mandatory climate curriculum in schools, so that every single level of education in South Africa, knows about climate change and knows how to treat the environment.”

-

Ayakha Melithafa at World Economic Forum 2020 in Davos

Ayakha is a 17 year old dedicated climate activist from Cape Town, South-Africa. She educates and inspires others around her, and tries to show people how to live with a low-carbon footprint. She was also one of the 16 young people whom officially filed a complaint against the United Nations Committee on the Rights of the Child, on the ground of inadequate action to address the climate crisis.

GLOBAL CHILDREN'S DESIGNATHON AT A GLANCE

What is a 'Designathon'?

During a designathon, children aged 8 to 12 years old invent, build and present their self-devised solutions to a social or environmental problem around one or multiple Sustainable Development Goals of the United Nations. Through the workshops, children gain knowledge on the SDGs and develop 21st-century skills, such as creativity and technological literacy. If you want to know more about the Designathon method, please go to page 50.

Focus of learning:

Collaboration & communication

Creative thinking & problem solving

Technological literacy

Global citizenship

Changemaking skills

Why do we work with the Sustainable Development Goals?

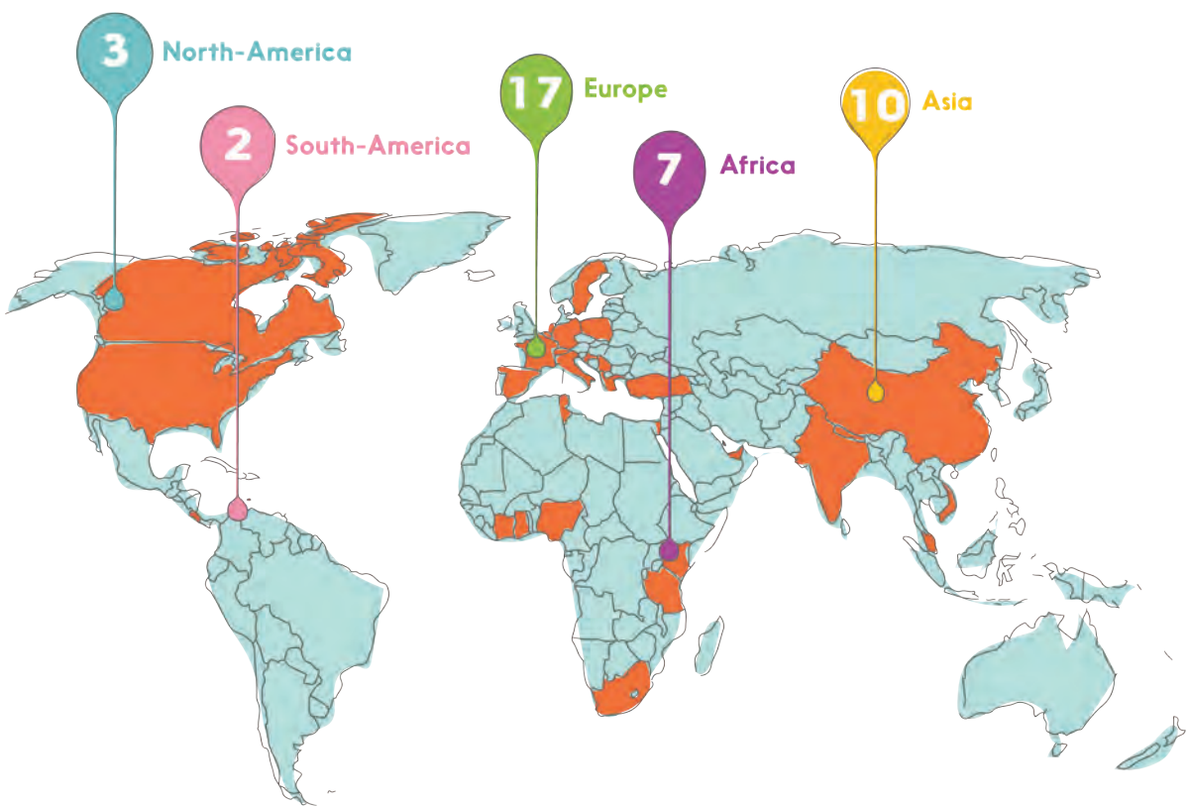
The United Nations (UN) has established goals to unite the world in tackling the pressing matters we are currently facing, categorised into 17 Sustainable Development Goals[1] (SDGs). The SDG target is set for 2030, which means that in the coming 10 years we will have to find ways to reach these goals effectively. The realisation of the SDGs requires cooperation, collaboration and partnerships. In this process, we believe that it is essential to involve all generations, including children, in finding solutions to the problems. At Designathon Works we know that the application of theoretical knowledge to real world problems creates a much stronger learning incentive for children. It is about connecting to the children's innate curiosity, as well as their empathy to make the world a better place. We use the SDGs as a source of inspiration for our workshops, meaning we create child friendly content by combining the different SDGs into a specific theme. Furthermore, educating children on the SDGs empowers children to become changemakers and educate others around them. However, we do not only contribute to the SDGs through our themes. As an organisation, we also play a role in achieving SDG Goal 4: Quality Education, since we aspire to develop future-ready education for children all over the world.

"Education can, and must, contribute to a new vision of sustainable global development." - (UNESCO, 2015 from Rieckmann (2017))

[1] For more information on the SDGs: https://www.un.org/sustainabledevelopment/

About the Global Children's Designathon

The annual Global Children's Designathon (GCD), initiated by Designathon Works in 2014, is a day dedicated to celebrating what the world could be like when children are put in charge of designing better futures for people and planet using new technologies. The GCD is also a call for changemaker education on a global scale. On this day, children from participating cities worldwide work together on developing their own ideas and building prototypes, simultaneously. As the designathons during the Global Children's Designathon take place in parallel and the children have contact with each other through a live connection, children are united in their fight against the problems the world is facing. At the end of the day, the children will present their ideas to a panel of experts, to their parents, and to a public audience.



North-America	South-America	Europe		Africa		Asia	
Bethel, ME	Oranjestad	Amsterdam	Milan	Abuja	Johannesburg	Beijing	Hanoi
Clearwater, FL	San José	Barcelona	Munich	Accra	Nairobi	Chengdu	Kathmandu
Montreal		Belgrade	Paris	Daloa	Tunis	Chennai	Kuala Lumpur
		Berlin	Sundsvall	Dar es Salaam		Dehradun	Panjim
		Brussels	Tel Aviv			Dubai	Riffa
		Geneva	Thessaloniki				
		Ghent	Warsaw				
		Härnösand	Zagreb				
		Istanbul					

1 DAY

1.200 CHILDREN

400 ACTIONS FOR CHANGE

FOOD & CLIMATE ACTION

Participants in Belgrade (left) & Zagreb (right)

About the theme: food and climate action

The 2019 theme centred around the connection between food production and consumption and climate change. Sub-themes were loss of biodiversity, hunger, greenhouse gas emissions and food waste. The challenge proposed to the children was: **“How can we produce food for everyone and treat the planet well?”**.

Why did we choose this theme?

Food is a big part of daily life in all countries. It is a wonderfully diverse cultural product and experience, which connects people and communities. The diverse group of children that participates in the GCD all come into contact with food in their own way. Focusing on a common denominator in a cross-cultural context enables us to explore the similarities and differences in children’s perspectives all over the world.

Because of the universal nature of the problem, its consequences affect the entire planet. Food is vital to human life, however, our practices threaten the earth’s current state, especially since food production is wiping out biodiversity at a fast rate. Due to the detached relationship consumers have with the origin of food, it is often overlooked as a large contributor to climate change: 26% of the global greenhouse gas emissions stem from the food industry (Ritchie, 2019).

How does this relate to the Sustainable Development Goals?

This year's GCD revolved around our current food consumption and production practices, which allowed us to connect multiple SDGs. To show the children the way the food chain operates, we grouped the main problem areas for the children under the following headers:

Land: loss of natural habitat and as a result loss of biodiversity.

Related to: SDG 15: Life on Land

The problem explained: The production of food takes up a significant amount of space, leaving little space for wild plants and animals to flourish. The UN has reported that: "100 million hectares of tropical forest were lost from 1980 to 2000, resulting mainly from cattle ranching in Latin America (about 42 million hectares) and plantations in South-East Asia (about 7.5 million hectares)" (UN, 2019).

Hunger: as a problem both locally, national and international.

Related to: SDG 2: Zero Hunger and SDG 3: Good health and well-being

The problem explained: In 2017, approximately 821 million people were undernourished. Malnutrition of individuals leads to them being less productive and more prone to diseases, resulting in low levels of education and no improvement in terms of quality of living (UN, n.d., 1).

CO_2 emissions: with meat production and transportation as main contributors.

Related to: SDG 13: Climate Action

The problem explained: Climate change is one of the biggest problems the world is currently facing, the cause of which can be traced to many different practices of the human species. One of those is the food industry, where livestock contributes approximately 14.5% of the global greenhouse gas emissions (FAO, n.d., 1). Another big contributor is the transportation of food, which accounts for 6% of the total greenhouse gas emissions stemming from the food industry (Ritchie, 2019).

Food waste: approximately ⅓ of the food produced gets lost or wasted (FAO, n.d., 2).

Related to: SDG 12: Responsible consumption and production

The problem explained: As the above number shows, a huge share of the food produced each year is not being used. It is either thrown away, by consumers or producers, or becomes lost due to poor harvesting and transportation practices (UN, n.d., 2). The realisation that food production is expensive, both in terms of money and effect on the planet, makes it clear that change is imperative in the way we treat food.

PART 2: THE RESEARCH

CHAPTER 2: RESEARCH METHODOLOGY

CHAPTER 3: RESEARCH RESULTS AND RECOMMENDATIONS

Beijing

CHAPTER 2: RESEARCH METHODOLOGY

2.1 Methodology and approach

The Global Children's Designathon creates an opportunity to listen to the voices of over 1,200 children worldwide, about their concerns and solutions to food and climate problems. However, deeper insights into their underlying beliefs and motivation, empowerment and collaboration, and the role education plays in shaping a new generation of changemakers, are required in order to fully understand these voices.

Based on these specific subjects, we designed tools/instruments to measure student outcomes and understand their views. During the event, all participating children received the research instrument in the form of a questionnaire, consisting of both multiple choice and open questions. Each child was to fill out this questionnaire individually, at two set time points during the day. The first questionnaire was given upon arrival, with no prior preparation on the theme or the content of the event. The second questionnaire was given after the children had completed the full design process and finished building their prototype. Questions on content knowledge, confidence and students' concern levels were administered at both time points as these constructs are likely to change over a short time scale, whereas items on empathy and teamwork were administered at only one time point as these skills are unlikely to change over the course of a single day's event.

In addition to the student questionnaire, observational data was recorded by a local researcher in each location. The researcher was assigned to a random group for observation throughout the day. Data on student interaction and an understanding of the student thought process was collected through this instrument. Data was converted to a digital form and all files across locations were merged, cleaned and analysed. Open ended questions were categorised into broad topics based on a substantive understanding of the topic.

During the development of the tools, the instrument was reviewed and field tested with students in Amsterdam for their feedback on language, content and comprehension. The tools were then translated by hosts into the local language. Multilevel regression models, t-tests and one-way analysis of variance (ANOVA) were used to analyse effect sizes and differences across groups.

2.2 Research question, sub-questions and relevance

The research was based around the understanding of the main question:

“How capable and engaged are young people across the globe to solve complex problems around food and the climate?”

In order to answer this question, we divided it into underlying components using the following categories:

1. The concerns of the children in relation to the topic “food and climate action”, measured in terms of their own worries, their chosen focus and their estimations of adults’ concerns and actions.
2. Their readiness to engage and contribute, as measured by their knowledge comprehension of the issues combined with their self-confidence, empathy, teamwork and overall changemaking capabilities.
3. Their proposed solutions (inventions), divided into the solution itself, as invented during the event, and answers given regarding the purpose of the solution, its origin and its intended beneficiaries.

The specific research questions we set out to understand these components are the following:

1. What are children’s perceptions of the problems regarding food and climate change and how were these tackled by them?
2. How did children’s attitudes relate to their ability to be an active agent of change (a changemaker)?
3. What did children propose as solutions to the problems related to food and climate?

2.3 About the participants

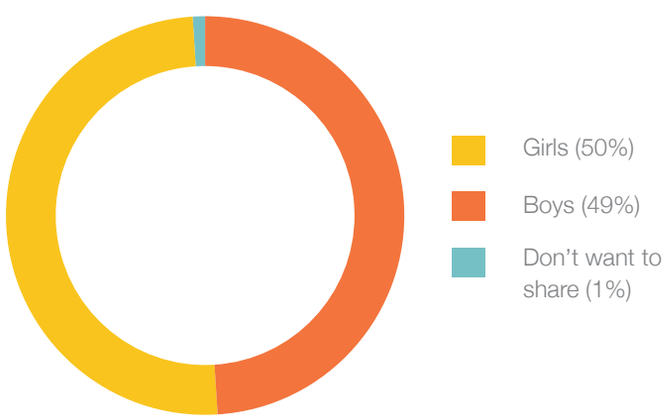
Applications to join the Global Children’s Designathon are open to all children between the age of 8 and 12 years old. The application process does not distinguish geographical origin, nor does it ask for background information, providing an equal opportunity for all children to apply. It is uncommon for cities to select participants, with the exception of large cities such as Hanoi, where applications greatly exceeded capacity, and Panjim, where all participants came from a local orphanage. Application procedures differ somewhat per city, but are always based on the child’s motivation to participate, and prefer providing the opportunity for new participants to join above returning participants from earlier events.

The majority of the research participants belong to the so-called Generation Z (born between 1995 and 2010). Generation Z is also known as the generation of world improvers: they have seen how their older brothers and sisters and/or parents went wrong and want to do better. This is also because the impact of the “mistakes” of the previous generation(s) can be felt more and more (think of climate issues for example). These children want to do something, because they feel responsible. They are eager to contribute to society, and to the world of tomorrow. (Broadbent et al., 2017)

In our research we included data from 883 children, participating in 32 cities, representing 26 countries across the globe (figure 2). Even though a total of 39 cities (1.226 children) participated in the Global Children's Designathon, the research findings only include data from cities where we were able to acquire a full data set. From nine cities, the research data was incomplete or insufficient, which led to the exclusion of these results. However, the inventions of those children are included in Part 4 of this report. The highest number of participants was recorded in Nepal with a total of 127 children participating.

Out of the 883 children who participated in the research during the GCD, a total of 433 were boys, 447 were girls and 3 children did not want to share their gender (figure 1). This means a slight majority of the participants were female. Although the event is aimed at 8-to-12-year-olds, in reality the ages ranged between 5 and 16 years. The youngest male participant was 6 years old and the oldest 15 years old. The youngest female participant was 5 years old and the oldest 16 years old. The mean age for boys was 10.50 years. For girls this was 10.46 years.

Figure 1:
Gender distribution among all GCD 2019 participants.



2.4 Comparing outcomes to country data

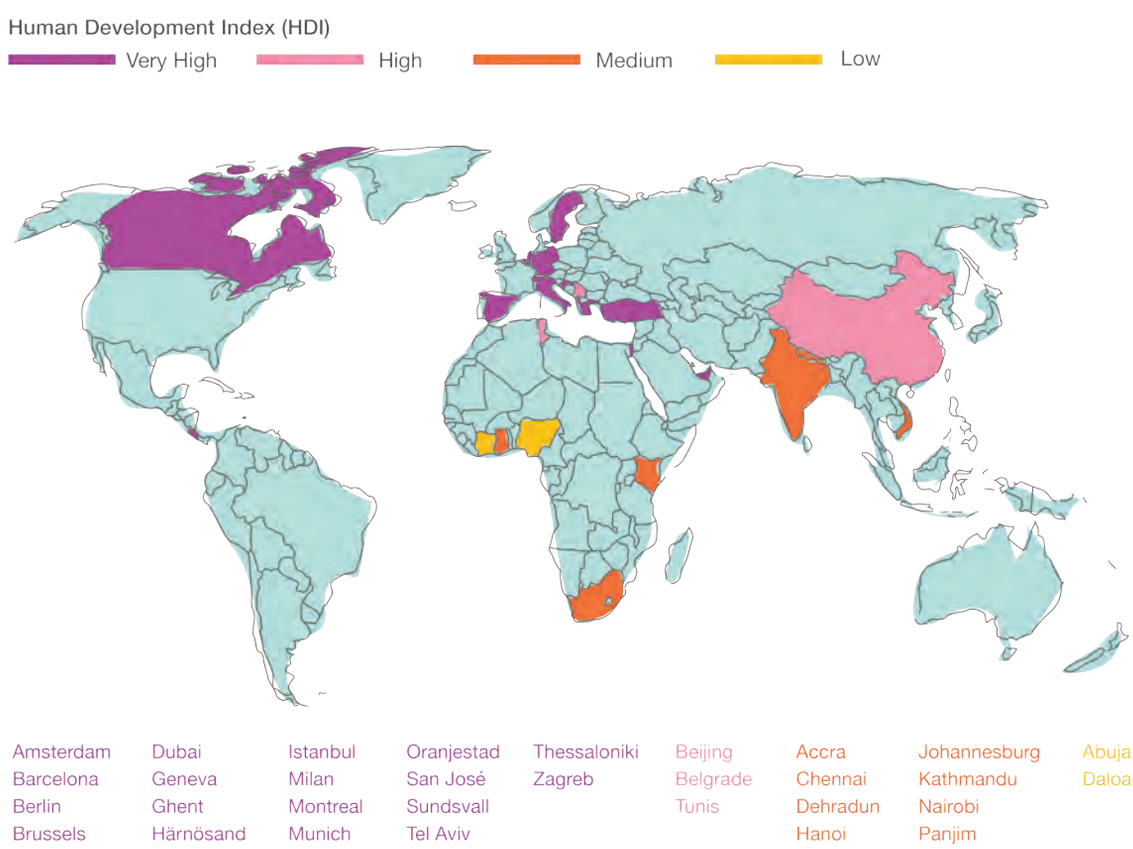
The results of the responses from the children through the questionnaire were compared against external datasets, including:

- The Human Development Index[2] – or simply, HDI – is an index used to rank countries based on their human development. Human Development Index is scored using indicators such as life expectancy, per capita income, and education (World Population Review, 2017). Nations that rank higher on this index have a higher level of education, a longer lifespan, and a higher gross national income per capita than nations with a lower score. HDI is ranked on a scale from 0 to 1.0, with 1.0 being the highest human development. HDI is broken down into four tiers: very high human development (0.8-1.0), high human development (0.7-0.79), medium human development (0.55-.70), and low human development (below 0.55). In order to analyse the research data against the HDI, the 26 participating countries have been divided into these groups. A slight majority of the participating cities were in the Very High HDI group (49.2%), followed by the Medium HDI group (32.6%). A total of 10.4% and 7.8% of the sample was distributed across the High and Low groups, respectively.

[2] Data can be found here: http://hdr.undp.org/en/data

- The Sustainable Development Goals Index[3] - or simply, SDG Index - is an index that is used to rank measure performance against the targets set for the 17 Sustainable Development Goals from the United Nations (Sachs et al., 2019). While it is not an official SDG monitoring tool, it uses data from official sources (such as World Bank, WHO, etc.) and non-official data sources (including individual research centres and non-governmental organisations). With all 17 goals weighted equally in the index, the country score indicates the country's progress against target outcomes. We observe through this data that even the countries that are performing best on the index, have a score well below the maximum of 100 "points" that can be awarded (Denmark has the highest ranking with a score of 85).
- The Sustainable Development Goal 13 Index[4], which is the SDG Index specifically for Goal 13: Climate Action, is calculated for each country (Sachs et al., 2019).

Figure 2:
Participating cities in the GCD 2019 research, mapped by HDI group.



2.5 Limitations and constraints

Due to the nature of the event, there were some limitations and constraints to the research.

- Questionnaires were translated by local researchers into the native languages as spoken by the majority of the children. Because the research was translated by a third party who was not involved in the development of the instrument, specific wording might have been lost in the phrasing of the questions, leading potentially to altered interpretations.

- Some participating cities host children from various cultural backgrounds with different native languages. Here, the most common language was used as the leading language in the research. We can assume that in those situations not all children had an equal understanding of the questions, possibly leading to fluctuating results due to the language barrier.
- The study was implemented as a pre-post quasi experimental study, which presents a challenge for rigorous causal inference. However, given the short time span of implementation, we can confidently attribute any differences to the intervention.
- As a part of the GCD, the theme was announced in advance of the event, so it is possible that some children had an existing awareness of the issue. Despite this, a statistically significant improvement in knowledge levels was observed after the event.
- Due to the different cultural contexts there is a different dynamic when it comes to tests and research. Where one city might weigh heavily on the serious participation and independent answering of questions in the questionnaire, other cities might have been more lenient on providing support or condoning collaboration. This also resulted in some countries only filling in parts of the research.
- Teachers were found to be helping children in some of the locations, with students also discussing responses to the questionnaire. This could lead to a slight under- or overestimation of results.
- Several countries have multiple participating cities. During the analysis of the obtained data, each city is measured as an individual dataset. However, when performing analysis using external data sets, the geographical data is often available per country instead of per individual city, requiring analysis to be done per country. In this case all datasets from the different cities within one country have been merged into one set of data representing that country. Note that this data was available for all participating countries in the research except for the island of Aruba.
- Children were presented with the issue of climate change in relation to meat production in a wider sub-theme: CO2 from food production, including emissions from cows for meat production and transportation of food.
- Some external analyses in this report are done based on the HDI index. Whenever HDI groups are analysed and compared against one another, it is important to note that the sample size of *Very High* and *Medium HDI* groups are significantly larger than the *High* and *Low* groups. This may cause a distorted image of how the groups perform relative to each other.
- The HDI index is a reflection of the development in a country as a whole and does not reflect the participating group of individuals. We chose not to collect specific data on the participating children and are therefore unable to say whether the index represents the children appropriately.

[3] Data can be found here: https://sdgindex.org/

[4] Data can be found here: https://sdgindex.org/

CHAPTER 3: RESEARCH RESULTS & RECOMMENDATIONS

In this chapter, we elaborate on the findings that emerge from our research, using supporting graphs and quotes from the children. Additionally, outcomes of the research are discussed and recommendations provided. In exploring how capable and engaged young people are to solve complex issues around food and the climate, the results are divided according to the three sub-themes: children's perception of the issues and how these are handled; how children's attitudes relate to their ability to be a changemaker; and, what children propose as solutions to these problems.

3.1 What keeps children awake at night?

This section explores the concerns of the children regarding problems around this year's theme 'Food and Climate Action' and their perception of how these problems are being managed by adults.

3.1.1 Children's concerns on food and climate change

Of the participating children in the Global Children's Designathon, 69.8% indicated that they are very worried about the world's food and climate problems, demonstrating that the majority of the children are aware of the problems plaguing our planet and realise that actions must be taken soon in order to change our current practices to more sustainable ones. These worries were even shown to increase during the day. We have done a comparison of the Overall 2019 SDG Index for all countries participating in the GCD versus how concerned children from that country were. Overall, we see that there is no relationship between the SDG Index of the country and the children representing the country. This indicates that no matter where the children come from and how well this country is performing on the SDGs, the children tend to be worried about the food and climate problems facing our planet.

Participants in Amsterdam

"

I am quite worried. In the future, species can go extinct because of what we do now. And so can we. If the earth keeps getting hotter, it will get to a point where we cannot live on it anymore."

-

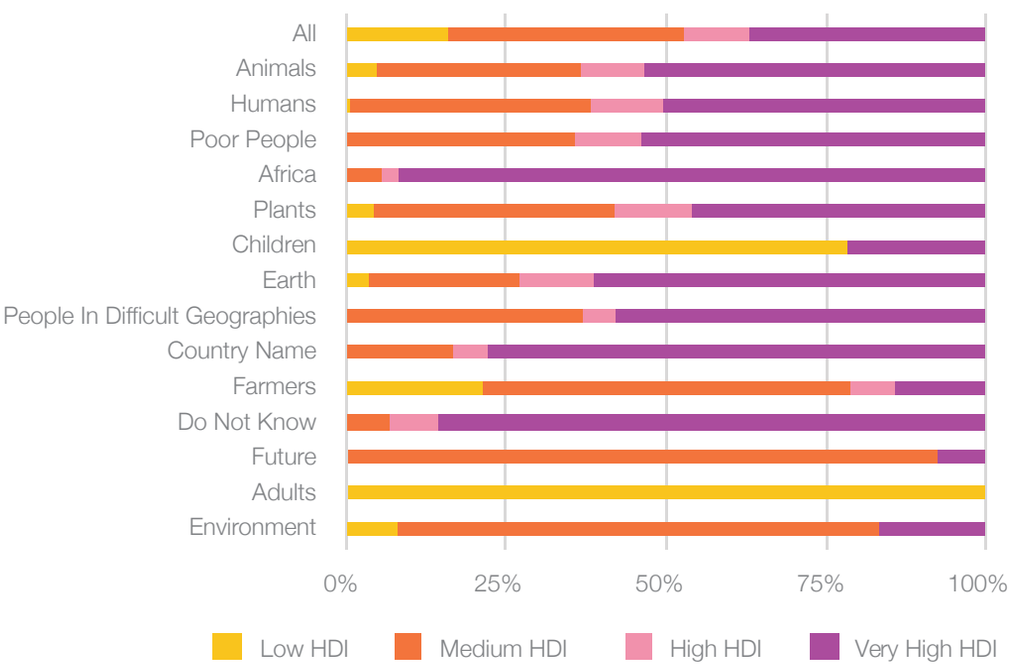
Vedat (12)

3.1.2 Who do children think food shortage and climate change affects?

When we analyse children's responses[5] of who they believe will be impacted the most by food shortage and climate change, the most common response was that "everyone" will be impacted. This shows that children recognise the urgency for finding solutions. Closely after "everyone", we see "animals", "humans" and "poor people" as common responses.

Interestingly, while a greater percentage of participants belonging to Low HDI countries said that the problems will mainly impact "children", participants belonging largely to Very High HDI countries stated "Africa" and "poor people" (figure 3). This shows a difference in perception among the different HDI groups.

Figure 3:
Responses to 'who does climate change affect' mapped against HDI groups.



3.1.3 Children's perception of concerns in the adult world

Children were asked how worried they think adults are about problems around food and the climate. We see that children generally do not believe adults worry much about the problems, certainly not as much as they do. The results of the questionnaire indicate that while around two thirds (61.7% before and 69.8% after) of the children answered that they are very concerned about the food and climate issues that we face today:

1. Children do not think adults are as worried as they are, with only 33.7% of children answering that adults are "very worried"[6] about food and climate issues (table 1).

[5] Responses are included if they had a frequency of more than 5

[6] To the question: 'How worried do you think adults are about food problems and climate change?', 33.7% of the children answered 'Very much', 35.1% answered 'A little bit', 16.6% answered 'Not really', and 14.6% answered 'I don't know'.

2. Children do not believe that enough is being done by adults, with only 31.7% of the children answering “yes”[7] when asked if efforts are being made in their family/community to act against food and climate problems.

Table 1:
Reported worry amongst children versus their perceived worry among adults.

Amount of worry about food problems and climate change (according to children)	Children (%)	Adults (%)
Very much	61,7	33,7
A little bit	22,8	35,1
Not really	4,1	16,6
I don’t know	11,4	14,6

“

Children do not believe adults are as worried as they are, nor that enough is being done by adults to act against food and climate issues.”

The results from this data are consistent with the results of surveys of similar nature. BBC Newsround’s survey, carried out by ComRes, questioned 2,000 children aged 8 to 16 in the UK (Boleto, 2019). The children were asked if they think adults do enough to protect the environment. The answers are similar to what was found during the Global Children’s Designathon: 53% of children answer that grown-ups aren’t doing enough. Older teenagers feel even more strongly about this issue, with 61% of children aged 14 to 16 stating they think adults should do more. Another research with similar results was done by Smart Energy GB (McGinley, 2019), where 77% of children aged 8 to 16 answer that they are more concerned about climate change at the moment than anything else. Of these, 13% of children say that they worry about climate issues at least once a day.

[7] To the question: ‘Do you think enough is being done in your family/community against food problems and climate change?’, 31.7% of the children answered ‘Yes’, 36.9% answered ‘A little’, 18.2% answered ‘No’, and 13.2% answered ‘I don’t know’.

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Source: twitter.com

NATASHA MWANSA (18)

“ The older generation has a lot of experience, but we have ideas.”

-

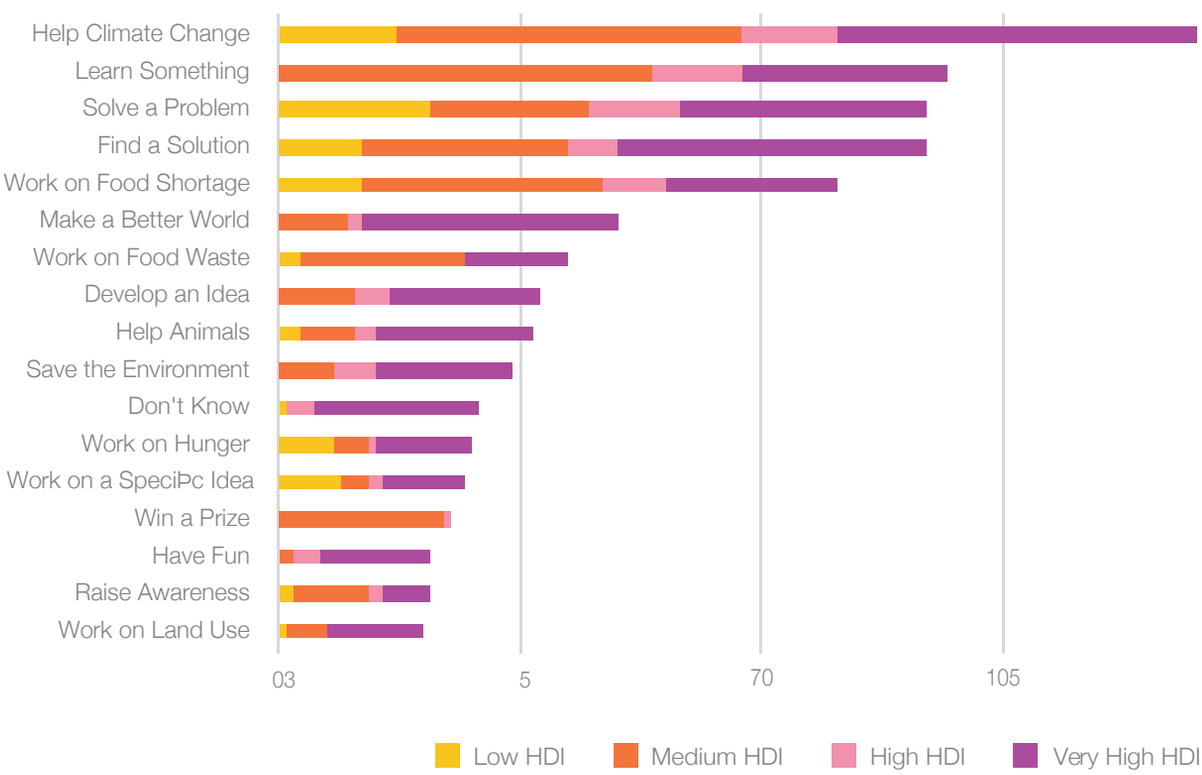
Natasha Mwansa at World Economic Forum 2020 in Davos

Natasha is a junior reporter and children & women’s rights advocate from Zambia. Natasha uses media to empower young people and women. Her mission is to unleash the power in women and children to make a positive change. At age 14, Natasha was youth representative at the United Nations Populations Fund in Zambia. Currently, she is part of the African Union Commission’s Youth Advisory Board. In May 2019, Natasha was awarded with the Global Award of the World Health Organisation, which is given to people who have accomplished incredible work on promoting health development around the world.

3.1.4 What are the children hoping to achieve?

At the beginning of the day, children were asked what they were hoping to achieve through their participation in the Global Children's Designathon. This was asked in the form of an open question. The answers the children gave can be grouped into three categories, focusing on: solutions, education and incentives. Most of the responses are given within the first category, i.e. focusing on solutions, which includes answers such as "help climate change", "solve a problem" or "find a solution" (figure 4). The second category, education, received the second-to-most responses, with children answering they joined in order to learn something during the day. Answers focusing on incentives include "win a prize" or "have fun" and received the lowest number of responses. Based on these results we can say that children are highly motivated to make the world a better place, as well as eager to learn.

Figure 4:
Responses to what children were hoping to achieve by participating in the GCD by HDI group.



3.1.5 What problems do the children want to solve?

As previous sections show, children are worried about climate change more than anything, regardless of their country of origin, and they are motivated and enthusiastic to solve problems and find solutions. When asked at the beginning of the day which problem they wanted to solve, the majority of the children (32.8%) indicated they wanted to solve problems around climate change, which is in line with the answers given to the question discussed in Section 3.1.4 on 'What are the children hoping to achieve?'. In contrast, only 3.1% of the children chose meat production as a problem they wanted to tackle. Figure 5 gives an overview of the responses to all the different answers.

Climate Change as a popular answer

A possible explanation for a high number of children answering that they wanted to solve climate change problems could stem from the popularity of this issue in the mass media that children view online or on television. However, it could also be caused by the low performance of the countries being represented by the children against SDG 13: Climate Change. Sachs et al. (2019) made an overview of countries worldwide displaying how well these countries are performing on SDG 13. Green indicates that a country is doing well, whereas red, orange or yellow means the country still has significant work to do. Figure 6 shows that none of the participating countries are marked as green on their performance on Goal 13, with most countries being marked as red or orange (Sachs et al., 2019).

Figure 5:
Responses to what problems the children wanted to solve prior to the event.

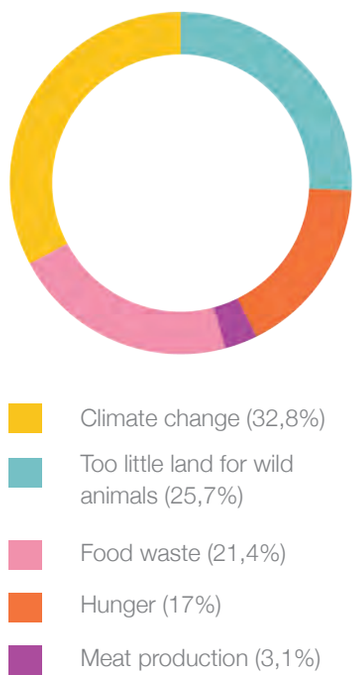
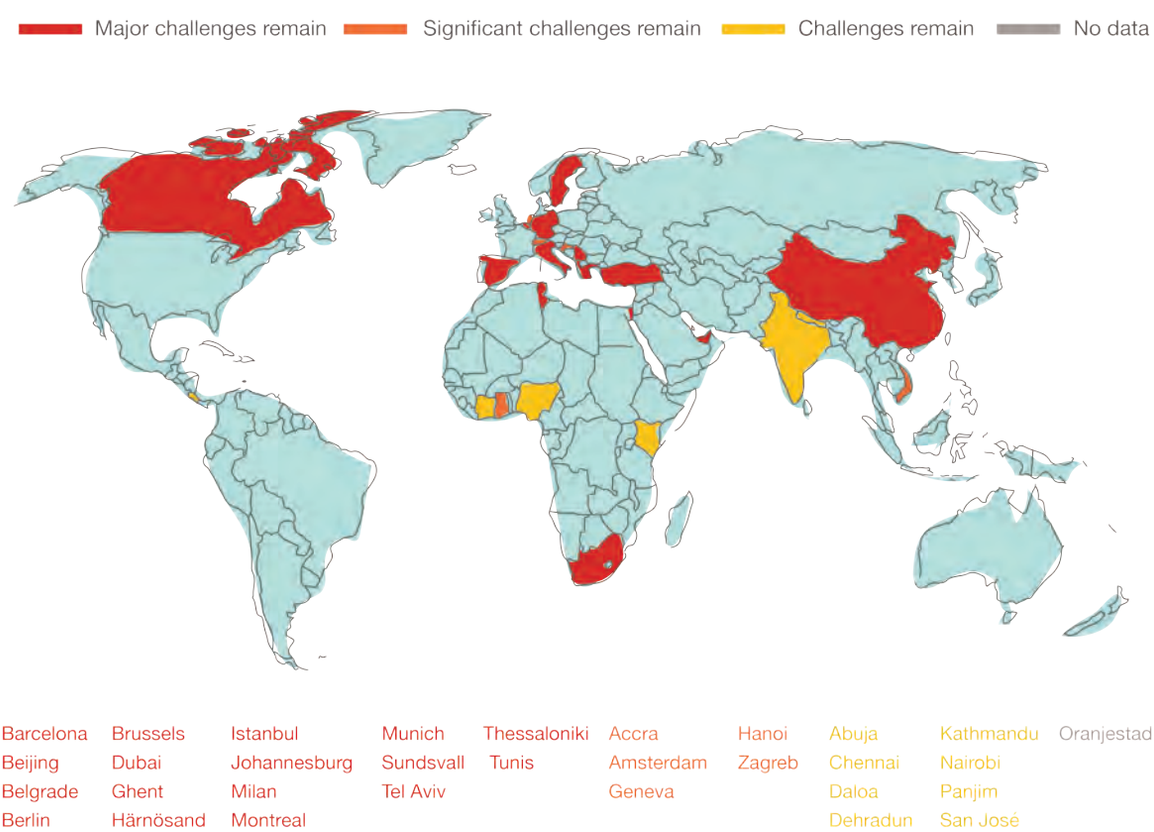


Figure 6:
Performance of all participating countries in the 2019 research, based on SDG 13 (Climate Change), retrieved data from the Sustainable Development Report 2019.



3.1.6 Recommendations

As the results indicate, a child's country of origin and how well this country is doing on climate change action[8] does not seem to have an influence on their level of worry over climate change: the level of worry about problems around food and climate change remains high among children from all participating countries. However, when looking at the results from the question "Who is affected by the problems of food and climate change?", we see that "Africa" and "poor people" were common answers given by children from Very High HDI countries, whereas the answer "children" was given by a majority amongst children from Low HDI countries. This reflects how socioeconomic differences can lead to well-meant but limited perceptions of the world. It is important for educational systems to ensure the development of a nuanced and holistic worldview amongst children, and it is therefore recommended to educate children in all countries, regardless of their socioeconomic status, that problems around food and climate change are a global issue, affecting all countries.

When looking at the children's perception of how the problems are handled, a growing frustration is evident in the current generation of children with regards to the inaction of adults in solving some of the issues the world is facing. In order to counteract this frustration, world governments and (multi) national organisations need to take more action to achieve the SDGs, as well as engaging the wider public, including young people. As UNICEF states, "Children should be given high-level platforms to share their concerns and ideas and to claim their rights to a healthy future and planet." (Clark et al., 2020, p. 609). We have to show children that we acknowledge and listen to them. As our research indicates, children are intrinsically motivated to take action, as they are eager to learn and are excited and willing to be actively involved in tackling problems around food and climate change. The latter alone should already be enough motivation for decision-makers to engage and include children.

[8] As measured by SDG 13 progress.

Johannesburg

3.2 Ready to contribute as a changemaker

In this section we explore the capabilities of the children. The results are divided into several subjects. Section 3.2.1 dives into the children's knowledge of the content, by looking at whether the children have gained new knowledge about the theme during the Global Children's Designathon. Next, we highlight some of the results regarding abilities, such as confidence, empathy and ability to collaborate in teams. The last section specifically investigates the children's changemaking abilities. In this report, Changemaking Ability is defined as the sum of the level of concern (see 3.1.1), content knowledge, empathy, self-confidence and collaboration scores. We measured these prior to and at the end of the event and created a total score for overall changemaking abilities from nine different questions[9] (Appendix 2). In this section each of the components of changemaking ability is examined.

3.2.1 Content knowledge

Both at the beginning of the day as well as at the end, the children were asked three questions to test for content knowledge (Appendix 1). On comparing the total scores for content knowledge across HDI groups, we find that at the beginning of the event the knowledge scores were balanced across the different HDI groups (figure 7). However, after going through the Designathon process, we found a statistically significant improvement in scores at the end of the event ($p<0.05$) (Appendix 1). The difference in the knowledge scores appears to have largely been a result of improved scores in the Medium, High and Very High HDI groups. Overall, the improved knowledge scores could indicate that the GCD leads to an overall increase in knowledge and awareness amongst children about global environmental problems. However, there are differences in the level of knowledge gained across the children from different backgrounds, with children from Low HDI countries showing no significant gains.

The three cities with the highest scores were Amsterdam, Berlin and Beijing, and the lowest scoring cities were Istanbul followed by Abuja.

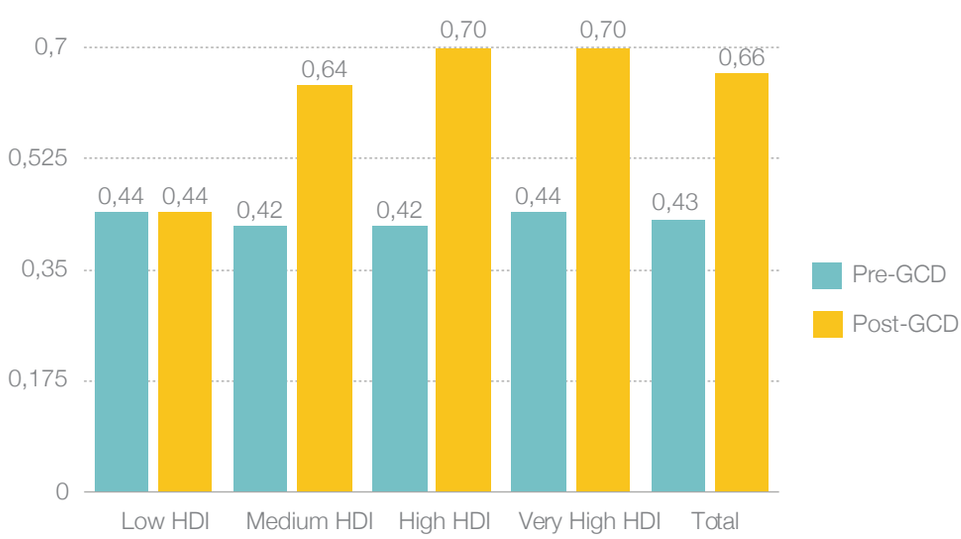


Figure 7: Normalised score for content knowledge at baseline versus endline, plotted against HDI groups

[9] The Cronbach alpha or the internal reliability coefficient for this construct is 0.45, which is reasonable.

MEET YOUNG CHANGEMAKERS THAT INSPIRE US

Source: deondernemer.nl

BOYAN SLAT (25)

“I simply used my list of concerns as challenges, and in fact a week later, as a school assignment, I had a chance to spend a lot of time on a subject of my choice. This gave me the opportunity to do new and fundamental research regarding plastic pollution.”

-

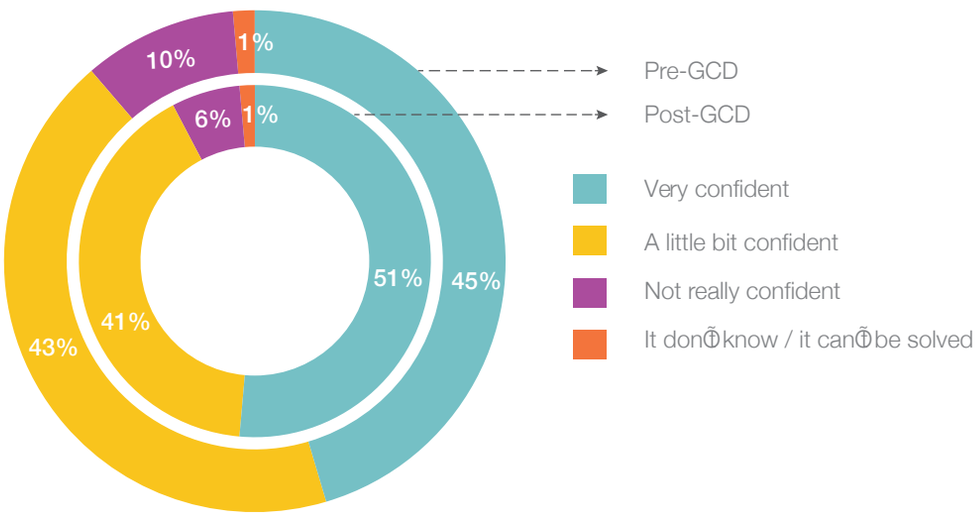
Boyan Slat at TEDxDelft 2012

Having seen more plastic than fish while diving in Greece, Boyan Slat (aged 18 at the time) embarked on a mission to cleanup the Great Pacific Garbage Patch, a gyre of plastic waste twice the size of Texas held in position by ocean currents between California and Hawaii. Five years later, his company The Ocean Cleanup has built an array of 60 systems that aim to reduce the amount of plastic in this garbage patch.

3.2.2 How confident are the children that they can solve issues?

At the beginning of the day, 45.6% of the children reported feeling very confident in their ability to solve problems around food consumption and production practices and the climate. This percentage increased to 51.6% by the end of the day (figure 8). This is a statistically significant difference ($p<0.05$), largely caused by the sharp increase in reported confidence from the High HDI (from 50.5% to 70.7%) and Very High HDI groups (from 36.6% to 45.7%) (Appendix 2).

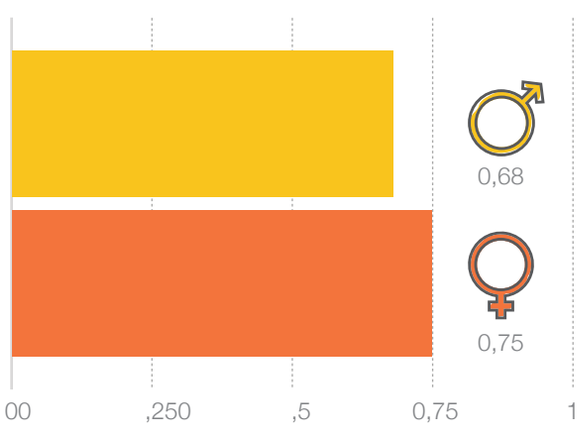
Figure 8:
Responses to self-appointed confidence levels on solving food and climate problems, pre- and post-participation in the Global Children's Designathon 2019.



3.2.3 Empathy scores

Empathy was measured through two questions. There was no statistically significant difference between the total empathy score across the HDI groups. When examined in terms of gender, girls scored higher on empathy compared to the boys (figure 9). There was a statistically significant difference ($p<0.05$) between boys and girls for both questions on empathy (Appendix 2). There was also a small but statistically significant correlation between children's empathy levels and their concern regarding food shortage and climate change ($p<0.05$).

Figure 9:
Normalised empathy scores distributed by gender.

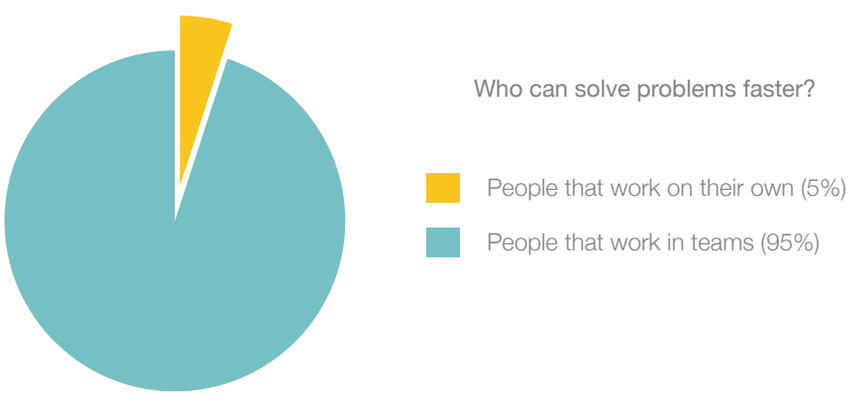


3.2.4 Willingness and ability to work in teams

At the end of the Global Children's Designathon, children were asked to report their experience with working in teams. Overall, children appear to appreciate and be good at collaboration (Appendix 2). Furthermore, the results show that children view working in a team as a positive experience (figure 10):

- 75.2% of the children state that they shared ideas with their teammates a lot.
- 80.8% of the children indicate that they managed to at least finish the goal they had set for themselves.
- 93.1% of the children express that they are happy working in their respective assigned or self-chosen groups.
- 81.4% of the children state that the work was shared equally by all members of the team.
- 91.4% of the children express that they enjoy working with their groups.

Figure 10:
Responses to the question who can solve problems faster.

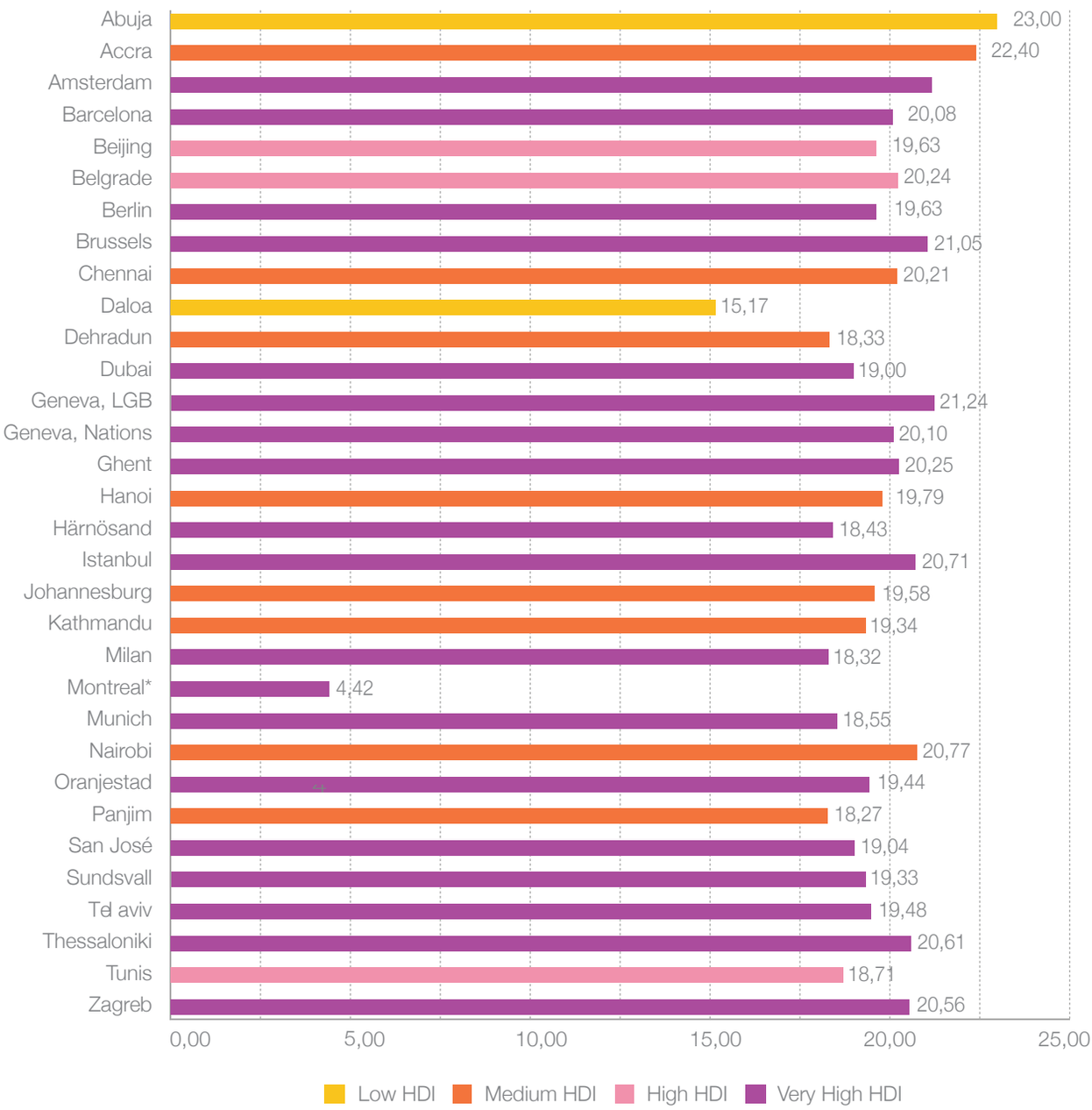


Children working in their design teams during the Global Children's Designathon 2019 in Montreal

3.2.5 Changemaking ability

Through combining children's confidence levels, concern, empathy and collaboration scores, we calculated the total scores for changemaking ability. Figure 11 summarises the changemaking ability scores per city. The four highest scoring cities are Abuja, Accra, Geneva and Amsterdam. When HDI groups are compared no difference is found in this score. However, it is interesting to note that Abuja, which is the highest scoring city on changemaking, was one of the two lowest scoring cities for content knowledge acquisition.

Figure 11:
Distribution of changemaking ability score for by city (max score = 25)



* The score of Montreal is an extreme outlier due to the fact that in Montreal the children were not able to fill in the second part of the questionnaire, which contained most of the questions we have based our changemaker scores on.

3.2.6 Recommendations

We observe no significant increase in content knowledge among children from Low HDI countries. This could be a reflection of underlying shortcomings in educational progress or context. Circumstances to take into consideration with these findings are potentially related to linguistic deficiencies (comprehension of language or reading abilities), personal circumstances (malnutrition or violence) or distractions in the working environment.

However, building on the finding that the overall content knowledge increases in the course of the GCD, it seems that the Designathon method is an effective method for developing knowledge and awareness on critical global issues in a creative manner. Furthermore, the level of confidence among children increased, indicating the GCD is an empowering experience, which could potentially lead to lasting impact on the children as "changemakers of the future".

When looking at the collaboration scores of the children, we observe that children enjoyed working together and that the work was shared equally among the team members. Additionally, children indicate that working in teams made their ideas better. Children seem to benefit from, be good at, and enjoy working together. Collaboration skills are incredibly important to have, as also recognised by UNESCO in their report on "Education for Sustainable Development Goals" (Rieckmann, 2017). We believe that children should be provided with more opportunities to work together in order to develop their skills further and to use their existing collaboration skills. Through this, intergenerational cooperation on sustainability decisions can be improved, leading to better and inclusive decisions (Clark et al., 2020).

> "The children indicate that working in teams made their ideas better."

Traditionally, children's capabilities have been measured in terms of their levels of knowledge and education. We propose looking further than that, for the following reason. As the results indicate, Abuja is one of the highest scoring cities on changemaker ability. At the same time, Abuja is one of the lowest scoring cities on content knowledge. When looking at skills needed for the future, changemaker ability might be a better indication of capabilities than the more traditional method of measuring only knowledge. At the same time, we very much believe education and thus knowledge are key in the development of children and societies as a whole, and indeed in changemaking abilities, since informed people can presumably more easily find solutions to problems (Rieckmann, 2020). However, the outcome that knowledge is not a precondition for changemaking abilities also underscores our belief that all children have the capacity to become changemakers, regardless of their current educational and socioeconomic level. We, as a society, should start empowering children to reach their full potential as agents for positive change by focusing on capabilities in parallel with knowledge acquisition, by including 21st-century skills, as practised in the Designathon method.

We asked:

"Why do you want to participate in the GCD?"

They said:

"I think it's important that my children can have a good future and so can I! If adults don't want to do anything about it, then we will!"

-

Julia (12)
Amsterdam

We asked:

"What do you want to achieve by participating in the GCD?"

They said:

"I want to achieve my dream of helping animals to survive."

-

Silindokuhle (12),
Johannesburg

We asked:

"What inspired your invention during the GCD?"

They said:

"I believe we can do anything in this world; nothing is impossible if we try. This idea inspired me to come up with my solution."

-

Anush (13)
Kathmandu

3.3 Children's solutions

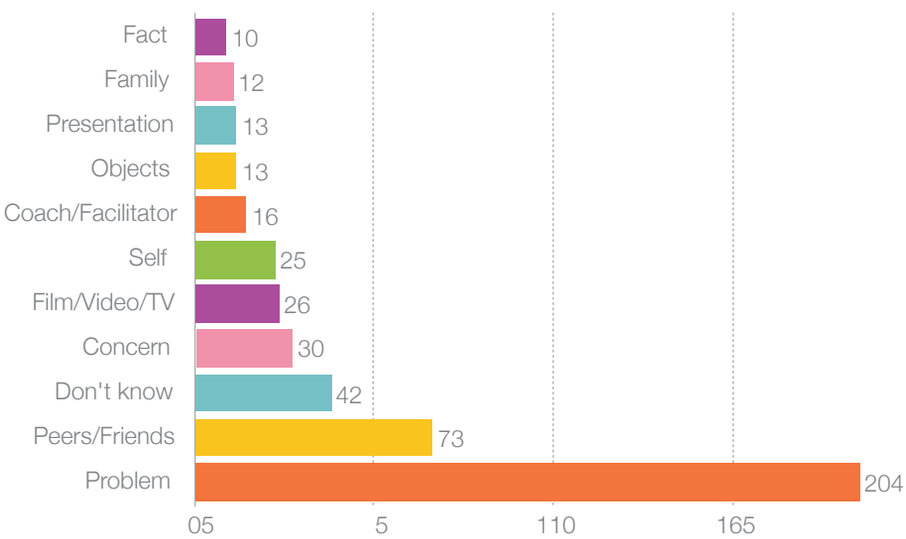
This section displays what children propose as solutions to problems in the fields of food consumption, food production, and the climate.

3.3.1 Source of inspiration

At the end of the day, we asked the children what inspired their designs. Figure 12 summarises the top responses[10] reported by children. Most of the children reported that the problem itself was their source of inspiration. Peers/friends emerged as the second most frequently reported source of inspiration.

> "The problem of climate change gets worse everyday. This inspired me to think of a solution to solve it"
>
> -
>
> Divine (12), Abuja

Figure 12:
Reported source of inspiration (only portraying sources identified with a frequency of 10 or more).



3.3.2 Solution areas

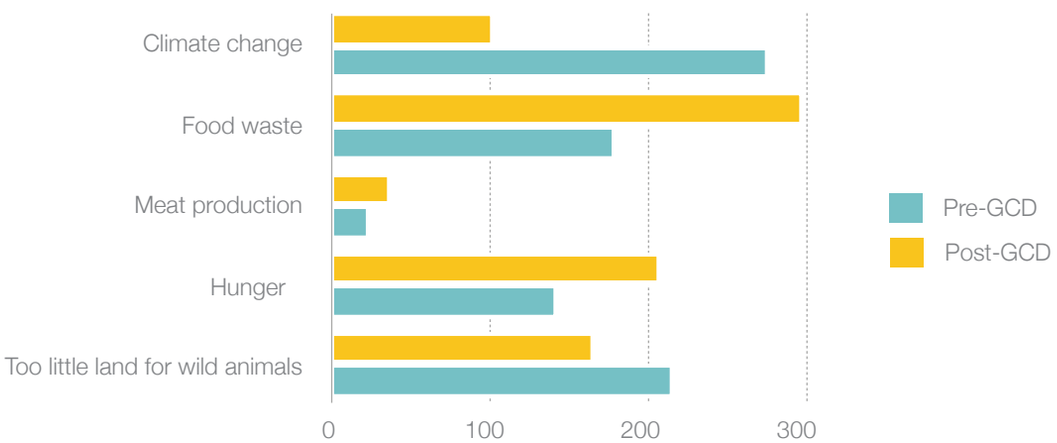
Figure 13 displays the answers of children when asked what problem they worked towards solving during the Global Children Designathon. Most children (36.4%) indicated they worked towards solving problems around food waste. Meat production was again the least picked answer, with only 4.9% of the children choosing it.

When comparing the data on what the children wanted to work on at the beginning of the day to what they actually worked on, we see multiple differences. While 21.5% of the children express a desire to work on food waste at the beginning, making it the second most popular response after climate change, 36.5% of the children report working on food waste at the end of the day. On the other hand, the percentage of children wanting to work on climate change (32.7%) decreased:

[10] With a frequency of more than 10

where 32.7% of the children answer they want to work on developing solutions to help climate change at the beginning of the day, only 12.8% report actually working on such solutions. This indicates that during the course of the day, children adapted their goal from an overarching issue to a more tangible problem. Interestingly, the data shows a larger share of boys ended up working on land related issues than girls, and a larger share of girls worked on food waste compared to boys.

Figure 13:
Solution areas before and after compared



Another interesting result lies in the comparison of the results of different HDI groups. At the beginning of the day, the majority of the children in the Low HDI and the Very High HDI groups wished to work on climate change. However, by the end of the day, most of the children from the Low HDI countries changed their preference and worked on hunger, whereas those from the Very High HDI group decided to work on food waste. We could therefore conclude that children are more likely to work on problems that are relatively close to them. The reason for this might be that they have seen the consequences of the problem in their own environment and want to solve it.

GCD 2019 invention: Children in Warsaw worked on tackling food waste

City: Warsaw, Poland

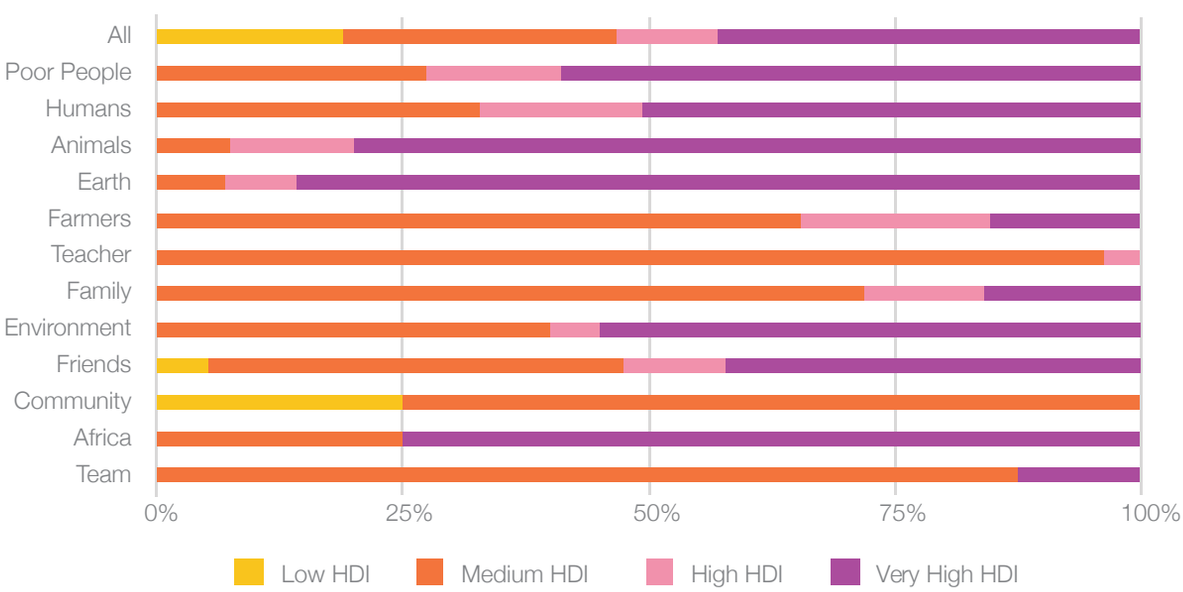
Invention: Vacuum-truck

A truck that vacuum-seals and dehydrates food, during transportation from one country to another. It then rehydrates it when it arrives at its destination. The goal is to make food take up less space and get to its destination without getting rotten.

3.3.3 Who do the children think this would help?

The most common response we received from children when we asked who they were trying to help with their solution is that they wanted their solution to help everyone (33.93%). This highlights the enthusiasm amongst children to have the maximum impact through their work. Figure 14 shows the other responses we received. We see that children from High and Very High HDI groups mostly tend to answer that they are helping poor people. This shows a high level of empathy towards people who are considered to be less fortunate by these children, and a recognition of how the world's food and climate problems, if exacerbated, will impact this stratum of society the most. Responses from the Mid HDI group showed a majority of them aiming to impact the immediate people around them, including their team, family or teachers.

Figure 14:
Distribution of reported impact of solution by HDI



3.3.4 Recommendations

As Bregman (2019) states in his book Humankind: A Hopeful History, one of the most valuable characteristics of humankind is that we have a skill called "social learning": we are good at connecting and learning from one another. Our data shows something similar, in the sense that it shows that peers, friends and family are an important source of inspiration for the children's solutions. Children learn from one another and from other people around them and base their solutions on what they have learned. Based on this knowledge we recommend that everyone aims to be an inspiration to others in any way they can, as this will provide children with as much inspiration as possible to come up with solutions for the world's biggest problems, and in turn, look towards children to be an inspiration for you and for your organisation.

It is interesting to see that during the event so many children decided to change their initial choice of problem to solve. Initially, climate change was chosen most often, but as the day progressed many children indicated they had changed their minds. It is possible that the theme presentation during the Global Children's Designathon, which also appears to have played a role in inspiring the children, influenced the children's ideas on which problem to tackle. Through the presentation, children learned more about root causes of climate change. The children might have picked up on the fact that climate change can be tackled through tackling its root causes. Education about the root causes is thus important to help children understand what they are working on. Educating children on the long-term benefits of prioritising the tackling of causes over solving consequences is an important component of the Designathon Method.

The majority of the children indicate that they want their solution to help everyone. As we explained previously, it is important to educate children about the worldwide impact of the problems around food and the climate. However, it is also important to teach children that it is okay to not try to solve all of the problems in the world, and that they don't have to try to help "everyone", as long as they can achieve a lasting impact for the group they are trying to help.

GCD 2019 invention: Children in Chennai worked on tackling hunger and food waste

City: Chennai, India

Invention: The food vendor

The food vendor is a vending machine that is located in areas where residents are economically disadvantaged. Restaurants can search for the closest vendor through an app and put good but excess restaurant food in the machine. The app also controls duration that the food sits in the machine.

PART 3: NEXT STEPS

CHAPTER 4: CONCLUSION & WAY FORWARD

Key Recommendations

CHAPTER 5: HOW TO GET INVOLVED

Montreal

CHAPTER 4: CONCLUSION & WAY FORWARD

The aim of this research was to amplify the voices of the children and to show the world the capabilities of young people from all around the world, through answering the question: "How capable and engaged are young people across the globe to solve complex issues around food and the climate?". Through a questionnaire among 883 children with different geographical and socioeconomic backgrounds, we were able to identify children's perception of the issues and how these are handled, how children's attitudes relate to their ability to be a changemaker, and what children propose as solutions to these problems. In the following section we answer the research question and summarise the recommendations from our findings.

When looking at the data, we see several points that provide us with the answer to our research question. **FIRST OF ALL**, children are worried about problems that are the result of our current food production and consumption practices and are frustrated about the way these problems are currently being handled. Such concerns do, however, motivate children to take action. During the day, children showed great enthusiasm and excitement to be learning about the root causes of the problems and to be working on finding solutions to tackle them and help the world. As argued by Cerasoli et al. in their analysis on whether intrinsic and extrinsic motivation play a role in performance (2014), intrinsic motivation is an important force in the execution of a particular task. Furthermore, Amabile (2013) names intrinsic motivation as an unmissable component in creativity. Keeping this in mind, we argue that children's intrinsic motivation to become active agents in their own future, such as excitement about solving what frustrates them, enhances creativity and performance and shows how children are excellent candidates to include in decision-making and action-taking on global problems.

SECONDLY, during the Global Children's Designathon, we observed high levels of what we believe to be important changemaking abilities: collaboration, empathy, concern and confidence. Furthermore, we observed that on average children easily absorb knowledge about global problems. We believe that knowledge and education are incredibly important in the development of children and societies as a whole. Moreover, these skills are important to enable children to be and become the next generation of changemakers, since informed people can presumably find solutions to problems more easily. At the same time, we found that knowledge is not a precondition for children to have great changemaking abilities. Once again, these findings show how children, regardless of their educational and socioeconomic circumstances, are perfectly capable of being or becoming agents for positive change in the world.

THIRDLY, we have found that children are creative individuals who come up with a great variety of solutions to the 2019 theme: Food and Climate Action. As we want to show the world the capabilities of the younger generation, we have included inventions from all countries in this report as well. You can admire the children's inventions in Chapter 6, starting at page 55. We believe that these inventions show the added value children can offer with respect to finding solutions to global problems.

As highlighted by the three arguments above, the voices and thoughts of children should be included as an important stakeholder when trying to find solutions to the problems we are currently facing in the world. We, as a society, should start empowering children to reach their full potential as agents for positive change by giving them a prominent place during discussions on global problems. In addition, we need to teach our children how to deal with less predictable and very complex futures by focusing on capabilities in tandem with knowledge acquisition, by including 21st-century skills in educational systems around the world.

GCD 2019 invention: Children in Dar es Salaam worked on promoting a sustainable diet

City: Dar es Salaam

Invention: Plant-based food truck

A cheap ánd tasty food truck that makes plant-based lunches for school kids. The truck has a screen that shows cartoons to educate kids about a plant-based diet and how to plant more greens and grains. It can result in people becoming consumers of more plant-based food.

Key recommendations:

For the education industry:

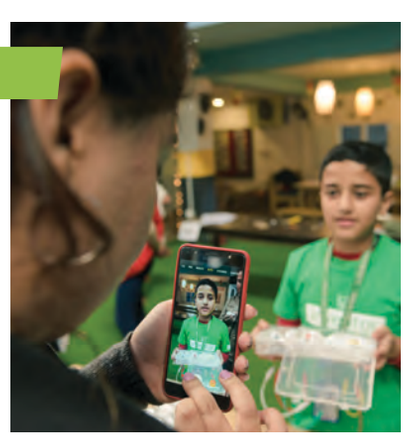
1. Education should incorporate small scale solutions for local change, in order to educate children regarding the possibility of regional impact as a tool for tackling larger global issues.
2. Climate related concerns among children should be addressed by providing educational experiences to increase knowledge about the root causes. This will improve children's level of confidence in finding solutions as well as enhancing their overall changemaking abilities and sense of empowerment.
3. Education systems should start empowering children to reach their full potential as agents for positive change by focusing on capabilities that benefit our present societal and environmental needs, in parallel with knowledge acquisition. In this regard, children should be provided with more opportunities to work together in order to further develop their collaboration skills and come to greater solutions together.

For the political field and business leaders:

4. In order to counteract a growing frustration about inactivity, governments and organisations should be active agents in achieving the SDG targets, as well as engaging the wider public, including children, in their endeavours.
5. Decision makers should benefit from the high intrinsic motivation of children to be active participants of change.

For you as an individual:

6. Everyone should aim to be an individual inspiration of positive change, in order to inspire the people around them, including children. In turn, we should be open to perceiving children as sources of inspiration for making the world a better place.
7. Global and local voices of the next generation should be amplified, in order to empower children in their role of making the world a better place.



Participants in Montreal (top), Johannesburg (second) , Brussels (thrid) and Kathmandu (bottom).

CHAPTER 5: HOW TO GET INVOLVED

5.1 Designathon Works: Empowering the next generation of young changemakers!

Worldwide there are 2 billion children of school-going age. How can we empower all children, so that they can design a better world? How can we prepare them to prosper in our rapidly changing, technological and globalised world?

The inclusion of young people – their voices, their ideas and their concerns – is a growing worldwide trend, and one that Designathon Works has been actively advocating. We want to see children and young people be recognised as the active stakeholders that they are in their own futures and have them included as co-creators of these futures. We believe that this trend is just the beginning of a wave of emancipation for young people, and that when children and young people are involved in shaping their world, we will see the emergence of a more just society fulfilling the conditions for a healthy planet.

For the past six years Designathon Works has been advocating for a radical reimagining of how society sees children and their role in that society. What if we saw children as changemakers, as engaged humans, as activists, campaigners, scientists or inventors, and then helped them to develop their passion and capabilities for these roles?

With our programmes we have, to date, worked with over 65,000 children in the age bracket of 7–12 years. Both our first hand experiences and the research in this report show that children can consider global problems carefully and come up with surprisingly creative and oftentimes credible solutions. Let's give them more opportunities to practice.

5.2 How can we educate the next million changemakers?

Designathon Works has designed a unique educational method which places the child at the heart of the process and is based on design thinking, maker education and children's natural interest in technology. This method is designed to work with children of all backgrounds and capacities and therefore is inclusive. It focuses on building the inner capacities of all children, regardless of their gender, country of origin, class, skill or learning situation. It recognises that all children can and want to contribute to a better world.

A Designathon is a structured workshop in which children, aged 7 to 12 years, ideate, build and present their self-devised solutions to a social or environmental issue related to the Sustainable Development Goals. The workshop lasts four to six hours and is facilitated by education professionals. The experience helps children practice and apply their creative thinking, changemaker skills, technological literacy and intercultural awareness. The power of the method lies in the combination of gaining (scientific) knowledge on world problems (the SDGs), developing 21st-century skills like creative thinking and collaboration, and feeling empowered to take action. The programmes vary from one-day design hackathon workshops to 10-week school programmes.

5.2.1 What makes the Designathon method different?

The Designathon method is different from other existing education methods, lesson materials and ways of learning, because:

1. A Designathon is a structured process with an open-ended assignment on the SDGs, which promotes **student agency** as proposed in the OECD 2030[11] Future of Education and their Learning Framework 2030.
2. The children not only gain knowledge on the topic, but also acquire a variety of **21st-century skills** (including creative thinking, complex problem solving and global citizenship) and are empowered to take action in whatever shape or form the children think is best.
3. It works with various groups of children regardless of their socio-economic background, ability or country of origin, which means it provides a **universal path** to create the next generation of changemakers around the globe.
4. It **connects** children from different contexts with each other to learn from their peers.
5. It creates **platforms** for children to be heard by society.

Participant in Beijing

[11] http://www.oecd.org/education/2030/

“

Worldwide there are 2 billion children of school-going age. How can we empower all children, so that they can design a better world? How can we prepare them to prosper in our rapidly changing, technological and globalised world?”

Accra

DESIGNATHON WORKS IMPACT

Since the official foundation of Designathon Works in 2014, the Designathon Method has reached:

60.000+ children*

*To calculate these numbers, we have made certain assumptions based on our experience. To read more about these assumptions, please go to Appendix 3 on page 103.

616
TEACHERS/FACILITATORS

have been trained and certified to give designathon workshops, worldwide.

45
COUNTRIES

have worked with us to achieve our mission

20.000+ inventions

So far, the Designathon Method has led to over 20.000 inventions around societal and environmental issues.

3.062
GLOBAL CHANGEMAKERS

During the last five GCDs, more than three thousand children have contributed to making the world a better place.

49
CITIES

whom have participated in the GCD overall

OUR MISSION

We envision a world where all children are engaged in applying their creativity to design a better world using new technologies.

The Designathon method step-by-step explainer

1

INSPIRE

A Designathon always centres on a specific problem, introduced in the theme presentation using images, videos and questions that will stimulate the children to think about the theme, make creative connections and start to wonder about if there are technologies that can help us solve the problem. Examples of such themes are; Mobility, Clean water, Sustainable cities and Life on Land.

RESEARCH

The theme presentation takes the form of a dialogue and discussion with the children. This way, the children can explore the topic to get to know the topic's causes and consequences, in order to tackle them hands-on during the workshop.

2

6

SHOW

When the prototypes are finished, it is time to present them! The audience may consist of other children, teachers, parents and others.

5

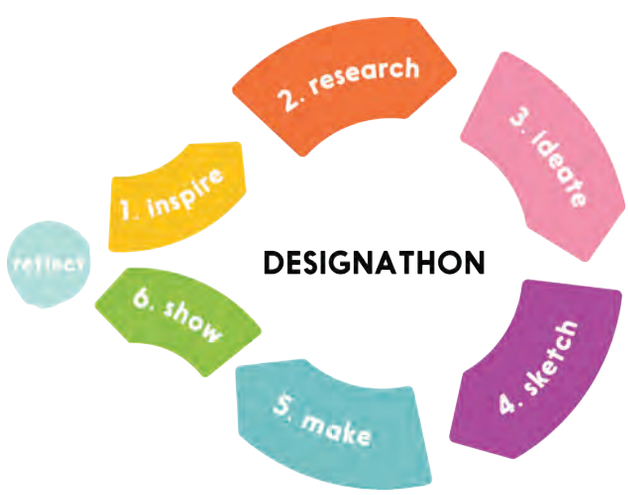
MAKE

The making phase is the children's absolute favourite part of the process, as this is when they can get their hands dirty. In this step, the children make a prototype of their idea, using repurposed materials, technologies and electronics from the Designathon maker kit (such as LED lights, solar panels, motors and switches). The prototypes show the inventions and campaigns in the most communicative way.

SKETCH

During this step, the children make a sketch or functional drawing of their idea. Through adding symbols, words or other details, they learn to visually explain how their invention will work. This sketch is the blueprint for the prototype the children will make during the next step.

4



IDEATE

In groups, the children begin to ideate in groups of three using the Ideation Worksheet. With the Ideation Worksheet they explore the problem step by step, deciding which part of the problem to zoom in on and for whom they would like to invent something. At the end of this step, they have written out their idea.

3

REFLECT

Usually, the teacher, facilitators and/or an expert panel is present during a Designathon presentation to provide the children with feedback on the prototype's feasibility, scalability and originality. Through this, the children are encouraged to think further about their process, their design and are able to take away valuable lessons on the environment and problem-solving.

5.3. How we aim for impact at scale

Our programme reaches children through three tracks. Firstly through school programmes and teacher training, secondly through tailor-made programmes in collaboration with businesses and institutions, and thirdly through our annual event: the Global Children's Designathon.

Designathon Works operates through chapters in ten global cities, which are run by independent partner organisations. While the Dutch chapter is still the biggest, the local chapters are growing in numbers and impact. The yearly Global Children's Designathon, now in its 5th year, has 40 global cities participating on all continents and is still growing. Our organisation has worked with 65,000 children and has trained 616 educators/facilitators who use the method in classrooms and workshops. We work with children from all sorts of backgrounds, from shanty towns in Africa to private schools in Europe.

The method is inclusive by design as it focuses on building inner capacities. This means that all children, regardless of their gender, country of origin, socio-economic status, abilities or learning situation, can benefit from this method. It recognises that all children have something of value to contribute. Our beneficiaries are the children we impact, the educators who work with them, and the organisations we work with.

5.4 What we need to further scale

We believe partnerships are the way forward. Since we are very serious about reaching our ambition of creating the next million changemakers, we need partnerships in many shapes and forms. That is why we are continuously expanding our network of supporting partners. We highly value our current partners, including: UNICEF, the World Wildlife Fund, Patagonia, City of Amsterdam, Erasmus+ Programme of the European Union, Bugaboo, Dopper, Tony Chocolonely and PwC.

So far, Designathon Works has been recognised by Ashoka, by the Lego Foundation and by Dubai Expo 2020 as a Global Innovator, and has been selected by HundrED as one of the world's leading innovators in sustainability education.

School programmes

Examples of school programmes include our work with 10 schools in Amsterdam. With the teachers we co-create innovative ways of teaching science and nature studies in the classroom.


Chengdu


Belgrade

Tailor-made programmes

Examples of tailor-made programmes we designed in 2019 are: Dopper Changemaker Challenge Junior, Amsterdam Designathon Challenge (OBA) and Design your own supermarket (UNICEF).

Global Children's Designathon

The Global Children's Designathon recurs annually in the first half of November. Every year the event is open to new applications from cities and hosts to host the event locally. The next edition will be on "Energy and Climate".

Dar es Salaam


Beijing

Want to be involved?

Whether you are a teacher, a parent, an environmentalist or a CEO, there are many ways to contribute to bringing inclusive and future-proof education and contemporary issues to the creators of the future. Find out more on page 54.

5.5. How can you be involved in our work?

By the act of reading this report you are already playing a role in supporting the next generation of changemakers. To take an even more active role as a contributor, you can help realise our goal of a better future for all children. Whether you are a teacher, a parent, an environmentalist or a CEO, there are many ways to contribute to bringing inclusive and future-proof education and contemporary issues to the creators of the future.

Are you wondering how you can help to empower children to design a better world on a personal or professional level?

Here's a list of things you can do as an individual:

- **Support** youth-led initiatives: Initiatives such as Make a Change World or Fridays For Future by sharing knowledge and networks or by contributing financially.
- **Amplify** the messages of young changemakers: Invite them to your events, spread their messages on social media, mention them in conversations and on stage.
- **Take young people seriously**: As an individual, start listening to children. If you show children that you truly value what they have to say and ask them authentic, open questions you will often receive amazing answers and insights. They will surprise you if you only listen.

Here are three examples of things you can do as an organisation:

- **Sign-up:** For our educational programmes or (online) teacher training with your school or educator team.
- **Ask us:** To design a tailormade design hackathon or to start a new design challenge on a specific topic, in your region!
- **Join us:** In our worldwide event as a local or global sponsor. The GCD theme in 2020 will be "Energy and Climate". In 2019 the GCD was sponsored by partners like: WWF, Patagonia, Bugaboo, Chocolonely Foundation, Talud, City of Amsterdam and PwC.

Sounds good? There's more. This is a once-in-a-lifetime opportunity to hop on board and be a part of a very international group of changemakers across the globe.

Only one more thing left to do, right? Send us an email: **info@designathon.nl** and we will take it from there!

PART 4: HOSTS

CHAPTER 6: INVENTIONS & GLOBAL HOSTS

REFERENCES & APPENDICES

Amsterdam

CHAPTER 6: INVENTIONS & GLOBAL HOSTS

6.1 About the inventions

Eventhough the event provided over 400 inventions for food and climate action, we are only able to showcase a small selection. To give an insight into the solutions designed in every participating country, the global hosts have carefully selected three remarkable, scalable, achievable or innovative solutions to be presented in this report. These inventions were mostly selected by a jury of experts present at the final presentations of the event, representing the community, businesses, creative leaders or young changemakers. Presenting these inventions provides a croos-section of the innovative solutions children were able to design in one days time. We are super proud of all of the children that contributed to designing a better world on 16 November 2019, and all inventions are as noteworthy and valuable as the ones presented in the following pages.

6.2 About the global hosts

The Global Children's Designathon is a collective effort of designers, entrepreneurs, teachers and volunteers from all over the world. All of these amazing individuals grant their time, energy and heart in order to organize and host a GCD in the country they live and/or work in. In teams or alone, the 'global hosts' make sure the event is optimally organized, facilitated, executed and evaluated in each city. Meanwhile hosts connected with each other across borders to discuss, inspire and co-create. Under the overarching theme and Designathon Method the global hosts and their teams have made it possible to create a worldwide impact. Per city, the following pages showcase the back-stories of these amazing people and their drive to help children co-create a better planet.

ABUJA, NIGERIA

Stella Uzochukw Denis & Geyus Michael Likita
Odyssey Educational Foundation

About the hosts:

Our organisation is among the pioneers of STEM education in Nigeria. We run a mentorship program for young girls in F.C.T Abuja, where girls are trained to research societal challenges based on the SDGs and offer solutions to the challenges using the STEM approach. Our host is Head of the Computer Science department, Geyus Michael Likita.

About the event:

Odyssey Educational Education is committed to exposing children to technology which is the driving force for innovation. Our organisation is participating in this years GCD so we can reach out more children effectively using Designathon method and tools. The GCD event is important to every nation especially a developing country like Nigeria because it encourages children to think creatively and design a better world using new technologies.

Project aquaculture

The aquaculture farms tackle both food and climate issues. It includes a cold room for storage and preservation of the fish from the pond, before consumption. The cold room is powered by a wind turbine. The fish can be used to feed the local residents. The water from the pond is purified for use in farming and drinking water and other domestic purposes.

Cool and safe earth project

Climate change is affecting our village with extreme heat. We decided to solve this by planting trees and provide clean electricity. We want to stop dangerous gasses from factories, from damaging the ozone layer. Our project uses the sun for electricity for the factories in the area. This will reduce gasses from the industrial area. We will also plant trees to protect people from direct heat from the sun.

Flood buzzer

Our design is a flood buzzer that will alert people of flood risks, when there is excess rainfall or when a dam is full. The dams will be equipped with two lights; green means no flood risk. The red light means the area is no longer safe and they need to evacuate the area. There is a pipeline from the dam to connect to the village farmland. The water is purified so it is safe for humans and crops.

ACCRA, GHANA

Jamel Buhari & Elizabeth Ofosuah Johnson
Dr. Monk

About the hosts:

Dr. Monk is an international agency that offers research and ideation, with a worldwide network of collaborating pioneers. We immerse ourselves in topics at the intersection of sustainability and global inequality, only to emerge with interventions that will have a systemic impact. Our goal is to contribute to a more equal, regenerative and compassionate future.

About the event:

This year, we are hosting the Global Children's Designathon in Ghana for the second time. Bringing children together from the Suhum area and the Agbogbloshie district, we are mixing children from both rural and urban environments. A unique opportunity for children from different backgrounds to work together and come up with refreshing and creative ideas.

Tomato harvesting box

This mobile tomate harvesting box focuses on land shortage. There will be less chemicals needed for growing and sustaining the land. A filter on the box makes sure that the excess water and seeds of the tomatoes that have rotten can be reused. These seeds can be planted again. So: fresh and clean products, without the (over-)usage of land and chemicals.

Compost making machine

This machine focuses on food shortage. Once organic waste has been thrown in the machine, it will vibrate at a regulated rate using solar energy. The organic waste is thus broken down into compost. In addition, the machine has tubes from which the compost can come out of. A farmer can then drive the machine around and distribute the compost more easily.

Fruit processor

This fruit processor counteracts food waste. The machine makes fruit juice, and then ensures that the seeds are collected so that they can be used for replanting or can be sold. The machine can also dry fruit, which can be sold. This can promote an alternative use of fruit.

AMSTERDAM, THE NETHERLANDS

Eline Karlas & Ina Conkic
Designathon Works

About the hosts:

This year's hosts are Designathon Works' creative director Ina Conkic and newest DW member Eline Karlas. Ina has been the GCD global coordinator since 2016. Eline has a background in international business and sustainability. They both highly value education and want to make a positive impact on the future generation's capacity to be changemakers for a better world.

About the event:

In 2019, children from all parts of the city and the rest of the Netherlands will join the GCD event in Amsterdam. Diverse in terms of their cultures, socioeconomic background, age and gender, the children will form a united group throughout the day. The Amsterdam event was held in the THNK, school of creative leadership.

Underwater farm

An underwater plant and seaweed farm in order to conserve space on land. It has a "land component" that floats above the farm, that uses solar panels to generate enough light to grow the food underwater.

Jungle Farm

The idea is two-fold: 1) Maximize space by building upward on large trees that are already there and 2) utilize the crown of the trees to farm insects for protein and house bees and exotic plants. There is a zipline so you can move from farm to farm without having to climb up and down every time.

Lampje

A friendly robot app in the supermarket to teach you and your parents about the benefits of plant based foods above animal alternatives. It also gives tips on meals and recipes.

BARCELONA, SPAIN

Judith López
Designathon Works Spain

About the hosts:

As a trained engineer, I have dedicated most of my life to the world of cyber-security until, three years ago and thanks to my children, I discovered the almost magical things that children can do thanks to technology.

About the event:

This year's Global Children's Designathon is a challenge for children to develop creative ideas to solve problems related to food & climate.

Tree of the future

This is a tree that can be grafted to grow all kinds of vegetables, so you won't need to cut down trees for agriculture (from carrots to broccoli). You can grow the tree in the garden in your house, so it also cuts down emissions from transportation.

Food sharing

Refrigerated containers to share the food we have left over at home with our community (neighbourhood, town, neighbours ...). Each container is for a different type of food (meat, bread and cereals or vegetables). In addition there is a 4th container to compose food that is in a bad condition.

Ship of Hope

This is a ship to take food to countries that need it after natural disasters. The ship works on animal feces so it doesn't contaminate.

BEIJING, CHINA

Jia Luo & MingYi Liu
IDEAS Youth Developing Foundation

About the hosts:

In Beijing, the event is led by IDEAS Youth Developing Foundation members Jia Luo and MingYi Liu. For Jia, this year's GCD will be her first event. She has background in intercultural communication and youth education. For MingYi, this will be his second GCD event. MingYi has a lot of experience in project facilitation and creative designathon.

About the event:

In 2019 more than 35 children from Beijing and nearby cities joined the GCD event. The Beijing event was held in IDEAS CAMP Beijing Experience Center which is the first experience center that has ever been built in the heart of a Chinese iconic city. The space provides a safe environment and a happy experience for 4-18 year-old children.

Underground city

It will give more underground space for farming and vegetable growing to save more land on the ground for animals and plants. It uses blue and red lights to simulate the sun.

Recycle Robot

This is a robot that can be put in schools and communities to recycle our wasted food. People put their leftovers into the right connector of this robot. Then the robot will classify the food into two parts: one is for fertilizer and the other part is for fodder.

Triangular Green House

This is a new type of greenhouse which will be build like a pyramid. A triangle is the most solid shape, so this greenhouse could be used in a lot of areas where climate conditions are not that stable.

BELGRADE, SERBIA

Tijana Jovanović Petrović
KidHUB organisation, Designathon Works Serbia

About the hosts:

Tijana Jovanović Petrović is a social entrepreneur, designer and educator. She launched the first socially responsible toys in Serbia called Koba Yagi Toys and is the director of KidHUB which is dedicated to empowering the creative potential of children and employability of young people through innovative educational programs, social innovations and creative entrepreneurship.

About the event:

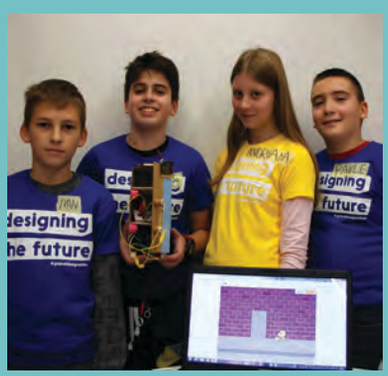
Tijana: I want to inspire children, and especially girls to see themselves as creators, artists, scientists - those who create solutions to social challenges! GCD and the Designathon Method are great ways for children to explore, collaborate and visualise their ideas on important topics such as the UN Global goals.

Technosolar

It is a vehicle on solar energy which transports unused food from local restaurants and green markets to poor and homeless people in Serbia.

Pyramid

It is a solar and aquaponic system of healthy food production which solves the problem of lack of soil in cities.



Refrigerator

Refrigerator powered by animal or food waste which preserves food in restaurants and on big farms or factories in Serbia.

BERLIN, GERMANY

Mark Garner and Dana Vetan
Design Sprint Academy

About the hosts:

Dana and Mark were first time hosts in Berlin. They usually train teams around the world in Design Sprints and Problem Framing, this was their first event or children. It was great to see them comprehend a big challenge and come up with remarkable solutions! The event was supported by the wonderful Bettina Bissinger, Sophia Lukash, Kinga Szilagyi and Joana Kohrs.

About the event:

This is the third edition of the Global Children's Designathon in Berlin. This year organised and hosted by Mark and his team for the first time. The event was held in the Design Sprint Academy's office in Berlin, the workshop space was ideal for their creative minds, the kids enjoyed the opportunity to check in with kids in Thessaloniki, Brussels and also Nairobi.

The 'Veat' Maker

The Veat Maker is a tabletop device which creates meat substitutes out of vegetables in your kitchen. When placing a selection of vegetables into the device they are chopped, mixed, blended and formed into attractive meat substitutes.

CCCC - Composter

Food waste is entered into this composter, it machinates it and adds bacteria to speed up the rates of decomposition turning it into ideal fertiliser which can be used for growing crops.

Methane Farm

The farm is a contained urban farm, powered by the methane produced by cows. The slurry from the cows is used as fertilizer for plants in the adjacent vertical farm. This means that dairy products and fresh vegetables can be produced in our city centres.

BETHEL, MAINE, USA

Paul Haberstroh
Gould Academy

About the hosts:

Mr. Haberstroh is a passionate teacher committed to design thinking and maker education. Mr. Haberstroh conducts workshops internationally on technology in education. He specializes in developing 3D CAD, design, engineering, and robotics curriculum. Previously he hosted the GCD in Clearwater (2017, 2018). This will be his first one in Bethel.

About the event:

Gould Academy is committed to environmental responsibility and serving the community. The GCD is the perfect event to bring awareness to the future stewards of our environment. Involving students at this age is crucial to setting the right environmental mindset and bringing new perspectives for sustainability solutions.

Crops on Water

A floating vegetable farm on freshwater lakes where farmland is not available. The farm is solar powered to pump water to the crops and for power lighting for night safety. The farm is terraced so all the crops receive sun and the water pumped from the lake can trickle down. The farm would be pulled to shore for harvesting. The design is scalable for all size lakes.

Food expiration reminder

An App that scans the barcodes of your groceries when you buy them and puts the expiration dates in the App in your phone. As the expiration dates get close, an alert is created on your phone to remind you to use the food before it spoils. This would significantly reduce food waste. Eventually all you would scan is the store receipt and it would contain all the expiration dates of the items.

Farm-resource sharing app

This App would help people find and share extra farming and gardening resources including available land, seeds, fertilizer, and other resources to help people have their own farm or garden. Farms and agricultural businesses that have extra unused capacity and materials would post them on this App for people to locate locally. This would help people without their own land or resources to have a garden or farm to grow their own food.

BRUSSELS, BELGIUM

Joos van Cauwenberghe & Marie van den Broeck
School community of RHIZO


About the hosts:

Marie owns design company ‘My Addon’, which is on a mission to make all (para)medical devices user friendly. She was awarded ‘Belgian youth entrepreneur of the year’. Joos works at the school community of RHIZO on scalable learning experiences that bring creative problem solving and project-based learning into the classroom.

About the event:

While Marie uses creative problem solving and design in her design company, Joos is a teacher and fully committed to bringing creative problem-solving into the classroom. We blended these focus areas by hosting the GCD in Brussels. We believe the mind-sets and principles of design really can make the world better, safer and more humane. That’s exactly the message that the GCD spreads and we’re very happy and eager to share and support that mission.

The Happy Meadow

The team thought cows are bored, because meadows are looking dull and they take up a lot of space, so they changed the barbed wire and fence to bushes and trees and added more small animals to the meadow. More biodiversity in the same area. They also added a small meadow loft so all the fruit and eggs that were not consumed by the cows or other animals can be processed to a dip or displayed for sale.

Tubefood

Do you have leftovers? Put it in the ‘foodtube’ and it will be sent to Africa. It’s a tube post for food. At a speed of 1200 km/hour, the food will arrive in Congo in 5 hours. The tube is cooled during the transport, so the quality of the food stays ok.

The tasty cycle

Robots come and collect your leftovers, mostly fruits or vegetables and the food transformer makes the food you want. The food transformer specialises in pizza sauces, dips and vegetable fries.

CHENGDU, CHINA

Chan Hao (William)

Fanpu life circle

About the hosts:

I am the founder of Fanpu educational farm and homestay in Chengdu countryside of China. Our mission is to promote the whole growth of Chinese children through creative tinkering, play-based education, garden-based learning, and also the sustainable development of rural area of China.

About the event:

I want to promote the sustainable development of China.

Ecological living tower

Cylinder shaped ecological living building, where each layer grows vegetables or life-stock. On top of the building, solar panels offer green power to help the building to rotate for better sunlight.

Food waste machine

A machine that enables the reuse of food waste.

Movable propaganda vehicle

A movable propaganda vehicle going to communities to remind people not to waste food.

CHENNAI, INDIA

Charlotte van 't Klooster & Shammy Jacob
New World Fight Club

About the hosts:

Shammy is founder of the New World Fight Club, a collective of Design Thinkers who help organisations solve complex business challenges through a creative method to trigger innovation while creating value. Charlotte is a researcher who works in the eld of Ethnobotany, Medical Anthropology and Intellectual Property Rights of Traditional Knowledge and is finalising her Ph.D.

About the event:

We LOVE innovation, and it lights a fire within us. We are solution seekers and finders, and we like to share and learn. We see and feel the need to build programs for children, including those with special needs. In our own kids, we acknowledge the deep effect that nature, food, play, and love have on their development and awareness of all things good.

Bio Tree

The Bio Tree has a structure like a tree but much higher. Each branch of the tree has a different temperature and condition to grow different types of plants. The tree runs on renewable energy. There is also a drip irrigation system that waters the plants.

Farming tower and drone

This is a tall tower that is constructed in areas where land is minimal. The tower has openings to let natural light in and an elevator to enable movement. The tower has a well that supplies water. There is a funnel on top to collect rainwater. All levels in the tower have beds of plants. There is also a drone feature that takes seeds and drops the seeds.

The food vendor

The food vendor is a vending machine that is located in areas where the residents are economically disadvantaged. The restaurants can search for the closest food vendor through an app and put the good but excess restaurant food in the machine. The app also controls duration that the food sits in the machine to transfer them to compost.

CLEARWATER, FLORIDA, USA

Jeff Hartwick & Will Vennes

Clearwater's Fabrication Lab at Saint Paul's School

About the hosts:

Jeff Hartwick is a director of Middle School and Summit Program, Will Vennes is an associate director of Innovation and Exploration at Saint Paul's - Clearwater's Independent School. Together they are hosting the third Global Children's Designate in Clearwater, FL.

About the event:

This will be the third edition of the Global Children's Designathon at Clearwater's Fabrication Lab at Saint Paul's School. The past editions were very successful with 53 students from diverse backgrounds creating some excellent designs.

Solar Livestock Water Collector

This design focuses on using less energy to provide clean water for the massive number of animals used to feed humans. Rain is collected in the upper drum, flows down a pipe to a charcoal-sand solar-powered filtration unit, and ends in the distribution tank where cows and pigs can drink clean water whenever they want!

Food Waste Recycling & Sorter Machine

This design focused on combining recycling, composting, and energy production into one unit! The Recycling and Sorter collects trash, food waste, and any kind of recycling - to be sorted internally while generating energy.

Great Pacific Garbage Patch Floating Island

This design focuses on using the massive amount of plastic waste in the Great Pacific Garbage Patch as the basis for a livestock-island to alleviate issues of space and waste in meat production. A forest is planted so that the roots hold together the plastic and the livestock can be allowed to roam freely with other animals.

DALOA, IVORY COAST

Mariame Yayatoure
Dr. Monk

About the hosts:

Mariame Yayatoure is a cocoa expert, a children's- activist & facilitator and trainer.
Mariame: I have lived and worked in cocoa communities for about 20 years. The situation of the producers remains the least enviable in the cocoa value chain. It's not fair to the children in the cocoa communities, whom unfortunately are born in severly deprived places.

About the event:

For me the children in the GCD are like defendants on trial, drawing their ideas and solutions to defend themselves. The goal is to manage for the children's ideas to convince the jury of adults, so that the adults assume their shared responsibilities in the defence of the children.

Anti-Waste Bin

This trash is equipped with both a computer allowing it to set certain parameters of use and a large box that will store food waste. The anti-waste bin uses a sensor with which it can sort out the spoiled foods that are not consumable and those that are still in good condition. Foods in good condition are rejected by the bin. If the food is waste the bin opens and receives the waste.

Seeding Machine

The seed machine is designed to combat hunger and deforestation. It gives farmers the opportunity to make planting seeds easier: a system can be used to enter how many seeds are required per hole. The plants also get water right away through a water mechanism that drips slowly.

Just-enough Machine

The Just-enough Machine can combat hunger and helps to make food at schools more efficient. Thanks to a knife and tube installed on the machine, the chef only needs to add the ingredients to the machine. These then come out cut to the right size and quantity. That way there is never too much food made.

DAR ES SALAAM, TANZANIA

Nancy Sumari & Luca Neghesti
The Jenga Hub

About the hosts:

Nancy Sumari is a published author, business woman and social entrepreneur. She is the Managing director of Bongo5 media group, a new media entity focused on digital content creation. She is the founder and executive director of the Neghesti Sumari foundation and The Jenga Hub, which runs programs that teach kids from marginalized backgrounds how to code.

About the event:

We held two GCDs in Dar es salaam and they were incredibly successful events that brought together children around Msasani Ward who took to solve challenges. We were amazed and inspired by how much the children were keen to solve issues faced in our communities and have fun while doing it.

Trash detection drone

A drone with a camera that detects trash at open spaces and then sends the GPS of a place with a lot of trash to self driving trucks that are powered by solar with special scoops. These trucks then take the trash to a special sorting machine that recycles plastic and alternatively creates mulch from left-over foods, so that farmers can use this fertilizer for their farms.

Plant-based food truck

A food truck that makes plant-based foods for school kids at lunch time and is very cheap ánd tasty. The truck has a screen that shows cartoons that educates kids about a plant-based diet and how to plant more greens and grains. During the weekend, the truck visits neighbourhoods to share the message of the cartoons, which can result in people becoming consumers of more plant-based food.

Ocean clean-up ship

This is a ship that sails the Indian Ocean and further. With a special machine it can suck oil, plastic and other trash from the ocean. The plastic is used for recycling. The oil is refined and changed into materials that are safe.

DEHRADUN, INDIA

Anant Bhaskar Garg & Manisha Agarwal
HaritaDhara Research Development and Education Foundation (HRDEF)

About the hosts:

In Dehradun the event is led by Ir. Anant Bhaskar Garg and Dr. Manisha Agarwal HRDEF's Director. Both of them previously worked in higher education and research and now develop hands-on games for interactive experiential learning. They are motivating the future generation to become changemakers using technology, design thinking and sustainable development goals.

About the event:

The Global Children's Designathon 2019 Dehradun was held at the HRDEF's campus. Students from diverse backgrounds participated and learned about design and do-it-yourself methodology. The students developed various prototypes using their creativity for innovation and support from the facilitator team. They presented their work with joy and insight.

VW - Vertical Wall

Smart use of space in a region with hills, by using vertical wall of the main house for land optimization and food self-sufficiency.

Energy Efficient Transport

Renewable-energy based food transportation using solar panels and biodiesel to reduce carbon emission and food wastage.

RTG – Rooftop Garden

By using this rooftop garden, there is less land required for growing food, and the waste from kitchen's in the house can be used for compost.

DUBAI, UAE

Nadyn Kesserwany & Talah Almously

The Wonder Generation

About the hosts:

Nadyn grew up in Lebanon and moved to Dubai 15 years ago. Through work, education and motherhood, she found inspiration in children's creativity and now runs programs that feed, sustain and enrich this asset. Talah grew up in Lebanon and lived in Europe, America and the UAE. She is encouraging creativity in children and helping them acquire the right skills for a better future.

About the event:

Talah and Nadyn founded the The Wonder Generation because they believe in investing in the creative potential of children to mould them into changemakers and social agents. The Wonder Generation is a hub where children can acquire and practice skills that will set them apart and prepare them for the future. The Global Children's Designathon fits all of these criteria. We love the message the GCD is sending out to the world and we are privileged to be part of this initiative.

Cow Factory

This team designed an indoor farming factory for cattle, that is self sustaining with solar-panels and windmills and water panels. It includes a mating room, a feeding room where grass is grown, a milking room for the moms and a butcher room for the old cows. There is also a chimney that filters the air and captures greenhouse gases.

The Cow Building

This team designed a building for vertical dairy farming where the cow poop and farts are used to make fertilisers to grow the food that the cow would then eat. It is a closed system that has zero waste and saves space by being vertical.

The together cycle

This team designed a factory where everyone is welcome. Food waste is used for compost and the edible food is taken apart for poor people. It is a combination of recycling, repurposing and reusing with a social aspect.

GENEVA, SWITZERLAND

Meriel Rhodes & Dunja Chamberlain
The International School of Geneva

About the hosts:

In Switzerland the event is hosted by the International School of Geneva known as 'Ecolint'. Founded in 1924 it is the oldest International school in the world. A key element of our curriculum is to align learning around the UN Sustainable Development Goals. Our mission is to empower students with knowledge, skills, competencies, attitudes and the voice to help solve the world's problems.

About the event:

This year around 70 students participated in the event which was held simultaneously at 3 of the school's campuses: La Grand Boissiere (Geneva), Nations (Geneva), and La Chataigneraie (Vaud). This was truly a brilliant event. A non stop day of solutions driven design thinking with multi-lingual exchanges across all 3 campuses as well as with international partners. Huge thanks to all who gave their time and energy to support the day and special thanks to the UN Food and Agriculture Organisation (Geneva) for co-sponsoring the event.

Floating Greenhouse

This team made a 'floating greenhouse' built out of reclaimed or recycled materials and powered by wind and solar energy. This design is GPS linked and controlled remotely.

The Vacuum Machine

This team designed a mobile device that can travel on land or water and sucks up plastic waste. Special fans remove any bad chemicals. Inside the vacuum there is a small farm with fungi and worms that will eat the plastic. The waste the fungi and worms produce is edible and can be turned into food for animals or humans.

Waste Not

This solution aims to make users aware of the amount of food that is being wasted in households. Powered by solar energy, a smart bin records how much you waste, and a smart fridge sends rotting food automatically to a compost bin. If you are wasting too much, you will be taxed according to how much you have wasted.

GHENT, BELGIUM

Maria-Cristina Ciocci & Amy Beaulisch
De Creatieve STEM

About the hosts:

The association wants to promote the development of the individual with all her / his talents. We offer access to tools that people do not have at home and to lesser-known materials and techniques. The goal is to stimulate creativity, interest, growth mindset and entrepreneurship, with attention for equal opportunities. Our activities are aimed at training 21st century skills and STEM talents.

About the event:

In 2019 we held the Designaton for the first time in our FabLab in Drongen. There were 9 participants thinking about and creating solutions for problems like food waste and climate change.

Changing life

This team thought about a different way of living. Separating the animals from the people to keep the animals safe. They also changed the school system, you start on the lowest level of the building and move up as you get older.

Water filtering system

This team developed a water filtering system with different filters that will collect dirt and garbage, ranging from big to small particles. Marine life will also be deflected so that no harm comes to them.

Future city

This team developed a new version of a city, one that is more in balance with nature, using natural resources like rain. They want to collect as much as possible of e.g. rain on wasted locations.

HANOI, VIETNAM

Nguyen Sy Hieu & Nguyen Thi Thu Trang
Ban Mai K-12 School System

About the hosts:

Hanoi is led by Nguyen Sy Hieu, Director of Cambridge International Programme of Ban Mai Education System, and Nguyen Thi Thu Trang, Director of Ban Mai's STEM Programme. Both Hieu and Trang strongly support the educational values Designathon brings to Vietnamese students and appreciate the opportunities it provides to students to nurture their interests in STEM and environmental issues.

About the event:

GCD 2019 Hanoi had over 50 student participants, 20 student facilitators and 20 teachers from 5 different schools across Hanoi. The event is hosted in Ban Mai Secondary School and widely featured in various news channels (Hanoi TV, various newspapers and online news channels). In this event, students not only brainstormed and developed ideas about this year's topic (Food and Climate Action), but also had opportunities to create an exhibition of recycled products about food waste and the importance of environment protection.

Safe house in flooded areas

This team designed a house to help people in flooded areas of Vietnam. When a flood comes, the house will emerge like a raft. The house is kept in position by four concrete piles. Thus, people living in the house can both be safe and protect their properties and food.

Food waste Riddance

Food waste riddance is a machine using a screw conveyor with an electric motor running at 6000 revolutions per minute in order to squeeze water out of food waste, crush the food into smaller pieces so we can easily dry and preserve them for a long time. It also has a sieve underneath to separate the water and raw food, which will be taken for drying and packaging.

Save food, save life" project

This team proposed two products for schools: publications and a food storage sensor. The publications are designed to introduce the life cycle of food and create student awareness about the importance of how we treat food waste. The food storage sensor is a wireless system including data logging software, a weight sensor, a dashboard weight which provides measurement data and an alarm.

HÄRNÖSAND, SWEDEN

David Gisselman
Technichus Science Center

About the hosts:

In Härnösand Designathon was led by Technichus in cooperation with Design I Västernorrland. Technichus is a Science Center with the goal of attracting interest in science, technology and entrepreneurship in a fun way. The purpose and goal of GCD is in line with activities Technichus wants to support and be a part of.

About the event:

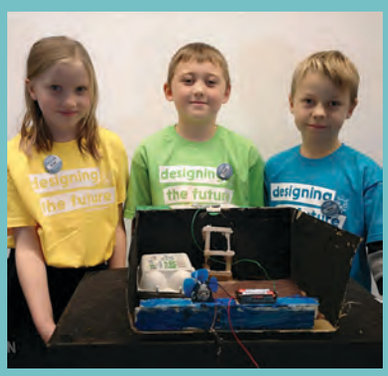
GCD in Härnösand was held at Technichus and in a good collaboration between staff and people who volunteered. Our goal was to attract as many girls as boys in Härnösand but ended up with a slightly larger number of applications from girls (18) then boys (12).

The scale (portion warning system)

The scale helps people reduce their food waste by personalised food portions system. The “perfect portion”: It’s good for your health and the integrated alarm system with LED-lights signals when the portion is far too big and the risk of food waste occurs.

Multiplicator (Reproduction of food)

This team said: Multiplicator makes your dream come true. Hunger will be no problem any longer. Multiplicator makes a copy of your last bite and in less than a second you got more, but not too much, food.

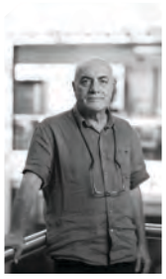


Underground cooling

Underground cooling is a combination of traditional methods for storing food with the support of modern technology. The food is kept fresh and preserved by utilising the cold that is in the ground (instead of refrigerators) and supplemented with fan systems powered by solar cells.

ISTANBUL, TURKEY

Erdoğan Kahyaoğlu & Sibel Çetingöz
Informel Egitim-cocukistanbul



About the hosts:

Informal Education-cocukistanbul is located in Turkey's only industrial heritage, the "Energy Museum" that served as Turkey's only energy power plant for more than 70 years. We run interactive education programs in the museum for children starting from pre-school up to high school. Our mission is to reach disadvantaged children by providing the programs for free to them with sponsor support.

About the event:

Istanbul will be joining the event for the second time and we are very excited to be making it possible. Sustainability is a topic we have been concentrated on with our "energy education program" for school children and with a separate program "Our planet has a message!" which is still current. The GCD not only supports our efforts to increase awareness and motivate children to act for solutions about this crucial topic but also increases their understanding that they are not alone to deal with this and that they are a real "power of change" together with their peers all over the world.

Food transformer (FT)

This internet controlled Robot sorts out wasted food and produces meals and/or cakes with this in various compartments, including an innovative oven. It does not process meat. The robot uses solar energy to operate. The final waste is transformed into fertiliser. The website also provides alternative recipes to people and is used as a powerful tool to increase awareness on the food waste issue.

Conscious plate (tabaklator)

Restaurants and especially self-service restaurants appear to be an important source of food waste. This invention helps through the usage of an "intelligent plate" that warns individuals when they take too much food compared to how much they need (based on their age and physical requirements). The invention also offers boxes to bring excess food home. These boxes are reusable.

MET 1

These cattle-sheds are used in the countryside and are equipped with a vertical farming structure where the food for the cattles are freshly produced. Methane, produced during digestion, rises up as it is lighter than air. A circular system captures the metan and directs it to a power generating unit, and this energy is used for lightening. Oxygen is pumped in regularly from the bottom to provide the necessary healthy air conditions.

JOHANNESBURG, SOUTH AFRICA

Phuti Manguba & Isabel Brenner
Designathon Works SA

About the hosts:

Phuti Manguba is a Design Thinking Strategist and Service Designer. She is the founder of Barweshi Consulting, a start-up using innovative approaches such as Design Thinking. She is also passionate about teaching children to use critical thinking and creativity. Isabel Brenner is the graphic designer at Designathon Works HQ. This year she co-hosted the GCD in Johannesburg to execute research.

About the event:

The Johannesburg event took place at the WWF SA office in Johannesburg. The event was facilitated by WWF employees as well as by part of the team who facilitated last year's event at Microsoft. The 33 children who joined the event were from divers backgrounds, with a similar amount of boys and girls.

The Cool Kids Farm

On this farm, the vegetables grow upwards to use the land efficiently, and have artificial light instead of the sun. There is a pump that pumps water to all levels of the farm. This way we can make more food and save space.

The Hunger Scale

This invention is a scale that measures the exact amount of hunger you might have. Based on what and how much you need, the scale produces food to make your hunger go away. This way it solves the hunger, and you can not eat too much, and no food is thrown away. You always get a healthy meal, you are never hungry and there is less food waste!

The Vending Machine

This vending machine redistributes the food that other people have left over. To use it, you don't need to have money; it takes recyclables in exchange for food. No food leftovers are wasted and the city is cleaned up as well. This machine would be on the street in the city so people without money can reach it.

KATHMANDU, NEPAL

Pragesh Rajkarnikar & Anuradha Shrestha
Karkhana

About the hosts:

Pragesh is a BBA graduate, an educator and a people's person. He is working as Relationship Manager at Karkhana. He believes there must come a change in the way children are being taught in school. Anu is a social worker and an educator at heart. She is working as a Province Director at Karkhana. She wants to empower girls by providing them opportunities to bring their ideas alive.

About the event:

As Karkhana has been working to promote hands-on education, we think the kind of work Designathon Works is doing is more or less similar. We believe in the importance of giving students practical learning experiences and problem-solving skills, which is why GCD is important and we wanted to collaborate with Designathon Works.

Crop protection system

This idea prevents crops from being destroyed by elephants, so that farmers can grow food crops instead of tobacco Tobacco is not consumed by elephants si it is easier to grow. The invention is a 4 layer defense system around fields: a set of beehives, a ring of chili pepper plants, a bamboo hedge and a wire of some sort. This protective system prevents the crops being destroyed and tobacco farmland can be used for food crops.

The driving farm

This team invented a car where plants are grown on the roof of the car! This way, land space is saved.

Solar community fridge

This team thought of a fridge, powered by solar, through which you can share your food leftovers with the community

KUALA LUMPUR, MALAYSIA

Anne Marie Tan & Marina Abdullah

Taylor's Lakeside Campus

About the hosts:

In Kuala Lumpur, the event is led by Anne Marie Tan and Marina Abdullah. Having worked in the social impact sector together for six years, both Anne Marie and Marie now currently work for Malaysia's largest collective impact organization which aims to deliver high value life skill-based education to low performing public schools across the country.

About the event:

GCD Malaysia welcomed 75 children from across the city and country. To encourage equality, diversity and inclusion, the event hosted children from low-income households, refugee communities and international schools to gather and work together toward a shared objective. The event was held at Taylor's Lakeside Campus, an academic institution committed to providing world class education and high impact research in Malaysia.

Aero-Deliveroo

The Aero-Deliveroo is a plane built with different compartments for different types of food. It is a flying storage space operating on solar and wind energy that will fly around the world and deliver food based on the scarcity in that area. If a place has an abundance of a specific resource, Aero-Deliveroo will pick it up and distribute it to areas that are in need of that resource.

Buffet Robot

Malaysia has a huge buffet culture, especially during the Ramadan period and various holiday seasons. To curb the issue of food waste during these times, the Buffet Robot functions with a team of 100 robots to take excess buffet food and distribute it to the poor. The robots are built to detect contaminated food products so that it will not be given to the poor but made into organic waste or compost instead.

Forever Food Machine

With the tropical climate and at times limited access to cold storage, the Forever Food Machine will input any fresh food item which will then be coated with an edible and non-toxic liquid that will keep the food fresh by more than ten times its original period. This will help people living in off grid areas with little or no electricity to keep and sustain their food.

MILAN, ITALY

Chiara Diana & Elena Marengoni
Frog

About the hosts:

Frog is a global design and innovation firm with over 50 years of history and studios in Europe, USA and Asia. The Milan studio opened its doors in 2005 and today is a family counting more than 50 hybrid talents; a blend of analytical and artistic, unconventional and structured, technical and creative.

About the event:

Frog Milan first hosted the event in 2017. 30 kids from the city and up to 90 minutes ride away joined us for the event. The energy level was very high all day long, with particular highs during the propotyping and of course for the final presentations.
We are already looking forward to host again next year!

The Groundskeeper Robot

Groundskeeper Robot is able to grow fruits and vegetables in people's gardens, allowing people with no time and expertise to grow their own food. It can grow greens inside its "belly" in case the owner does not have access to a garden! In addition, the robot analyses and takes care of the plants' state. It collects rainwater and uses organic waste to produce fresh fertiliser, notifying the owner when the harvest is ready!

Flying Fruits

Flying fruits is a system that allows farmers to ride an electrically powered rickshaw, which delivers fruits and vegetables directly to the customers' home, with the help of drones (inspired by hot-air balloon). The drones, which are parked inside the rickshaw, can fly directly on customer's balconies and deliver fresh fruits and vegetables. The customers are able to track the farmer's location through an app.

Save the Food

'Save the food' is a digital app that allows users to reduce their food waste by asking specific questions about their daily food-related behaviour. It will understand how much food the users need each day as well as what type of food they like. With this information it will be able to calculate the quantity and suggest the right amount and type of goods to buy at the supermarket, in order to not waste food by over-purchasing unnecessary products.

MONTREAL, CANADA

Rym Baouendi
Medina Works

About the hosts:

My mission is to 'help cities and youth rise to their full potential'. I am the founder of Medina Works, a strategy + design consultancy based in Montreal and Tunis that helps governments, non-profits and businesses craft impactful strategies and programs, develop skills, and build enabling platforms that foster youth innovation and contribute to advancing the SDGs within the context of cities.

About the event:

Medina Works is partnering with Designathon Works for the third year now by hosting the GCD in Montreal and Tunis. A diverse group of young Montrealers joined us during this year's GCD at the 4th Space, a public space that acts as a bridge between the research world and the wider Montreal community at Concordia University. Our young participants proved us again that children have relevant ideas and solutions that we should pay more attention to.

Food delivery robot

A solar-powered, GPS-controlled delivery robot that will bring food donations directly from food banks to those in need, at a rate of three meals a day and directly to their location.

Fart trapper

The "Fart Trapper" would be placed on sheep, goats and cows in order to capture methane "at source", in a balloon storage for later collection and processing into usable energy.

Food bus

A truck with a cold and hot storage section that roams the city to collect leftover food and distribute it back to those in need through a network of dedicated "stops" and according to a given schedule (just like public busses).

MUNICH, GERMANY

Kara Pecknold & Juliana Escobar
Frog Design Munich

About the hosts:

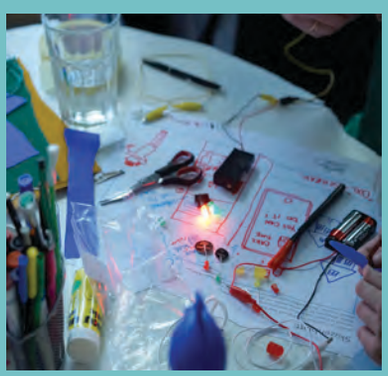
Kara is Creative Director at frog with a background in visual design and design research. She speaks, teaches and writes on design research methods and builds creative capabilities within organisations. Juliana is Program Manager at frog. She believes that working in collaborative teams is essential to build new possible futures through the right behaviours, systems, products and services.

About the event:

In the fall of 2019, children from Munich gathered at a design studio to join in a day of creativity and climate change with a passionate team from frog design. Diverse in culture, language and backgrounds, this group of students enjoyed a day of thinking big while also getting to know their local community better.

The cow fart-machine and air-cleaner

The farts from the cows are collected by the cow fart machine (one for inside in the winter, one balloon-like one for in the summer, when the cows are in the field) and you can put them in the air-cleaner, where the CO_2 is changed into O_2.



Biomaschine 3000

The Biomaschine 3000 can extract and filter the water from the organic waste at your home, to create water that can be used to water plants. This way the waste will use less space, and reduce the smell as well.

Cleanliness Monster for the Bali Greenhouse

This Monster is a three in one: clean water by filtering previously dirty water, produce clean water by removing the salt from it, and then use this clean water for a greenhouse in order to grow crops at your house for fresh vegetables.

NAIROBI, KENYA

Prof. Gideon Bin Klei & Anne Sallaerts
Nameta Trust


About the hosts:

Gideon: I believe in equality, Social Justice, an environment free from corruption and pangs of hard economies,not forgetting better climate. With all the expertise guys will practice day in, day out after possessing University degrees, the world still suffers. We still have something missing. Anne is the managing director of Designathon Works and helped facilitate the event in Nairobi this year.

About the event:

GCD 2019 was amazing in Nairobi. It was super cool to see the children make prototypes on Food and Climate Action. I liked the action booklet, which was introduced in Nairobi/ GCD for the first time. It helped so kids could take their climate action further after the event. The art of public speaking during the presentation was evident here. It can be so great to speak of your idea. I was very happy to see children and facilitators come on board for a common goal. I am very optimistic about everything and open to new ideas for the next GCD 2020. Can't wait!!

Jungle farm robot

This robot can create and maintain farms between the trees in the jungle, so humans do not need to go there and will not get eaten by wild animals. Furthermore, you don't need to cut down any trees.

Wasteless

This idea is a campaign on food waste via multiple channels, aiming to make people aware not to waste food but store it in a big fridge. After the food goes bad in the storage, you can make compost out of the wasted food.

Communal garden

This idea is a big communal garden with a huge fridge, so food does not go to waste after harvesting, or before it ends up on the market.

ORANJESTAD, ARUBA

Lisette Malmberg, Marlies Don & Jessica Besselink
HopeAruba Movement Foundation



About the hosts:

HopeAruba Movement Foundation is a civic organization striving to inform and empower individuals and communities to use their voice and potential to create solutions for collective well-being. Lisette Malmberg is the Founder of HopeAruba, Marlies Don is the Social Inspiration Lab Coordinator and Jessica Besselink is a certified SIL Head Facilitator as well as a high school teacher.

About the event:

The event will bring 30 children aged 8-12 from the district of Oranjestad together at one venue to think about solutions to this year's Global Children's Designathon theme: Food & Climate Action.

Recycle box

This idea is a box where people can put recyclable things, and other people can use it if they are hungry.

More plants for everyone

This group invented a box in which people can put seeds to grow plants.

Giving store

In this store, people can pick up 100 free products a week. Other people can buy products and pay a little more in order to finance the free products.

PANJIM, INDIA

Samir Mardolker & Akanksha Priyadarshini
Clear in Asia

About the hosts:

In Panjim, Goa, the event is led by Samy Mardolker, Managing Director of Clear in Asia, a global strategy consultancy. Samy is an experienced facilitator and has been hosting the event since 2016. This year, Samy was assisted by Akanksha Priyadarshini, co-founder of Food revolution, an Agritech Startup based in India, building agriculture systems using technology and plant science.

About the event:

The event in Panjim, Goa hosts the same set of girls since 2016. The girls are in the 11-13 year age band and come from underprivileged backgrounds. They are supported by a local charitable foundation in their education. Our belief is that having the same set of kids will reinforce problem solving skills in this group which most critically needs such skills and inspiration i.e. girls from underprivileged background from developing markets.

Fish market planning

On the local fish market, there is a lot of food (fish) wastage. This is mainly driven by the sellers being unable to predict demand on a specific day. This team created a system for the sellers to collect information on 'next day buying intent' from their customers to allow for better alignment of supply with demand resulting in less wastage.

Party food planner

Indian weddings typically have lavish displays of food, which results in lots of leftovers. This group designed a fire frame for an app that the party guest could log in and specify how much food they would consume based on menu items shared by the host. This would ensure that the right amount of food is cooked and there is no wastage as guests are primed to eat 'right'.

Grow in transit

There is significant food wastage when vegetables/ fruits are transported from the farm to the city. In some cases, this journey takes 3-4 days. This team devised a method of growing the crop in transit. Choosing a route that offers different soil type and water availability, a selection is made of crops that can avail of the best growing conditions with growth staggered across the journey to the selling location.

PARIS, FRANCE

Laurence Bertea & Aliénor Turpin
Eutopique

About the hosts:

Laurence and Alienor are both socio-anthropologists. Alienor is a university teacher and uses active pedagogy to transmit her passion for anthropology to students. Laurence heads an innovation and transformation lab and co-leads the qualitative studies department at an opinion and market research institute. Together, they founded eutopique, a non-profit organization focussed on education.

About the event:

For our first Global Children's Designathon in France, we were warmly welcomed by the CRI, a symbolically important place to host this type of event totally in line with the philosophy of the place. CRI brings together very diverse audiences throughout the world to design and prototype new learning ecosystems in order to mobilize collective intelligence and thus accelerate our ability to meet the SDGs. The forty participating children were mixed in terms of social class and backgrounds.

Stop Food Waste!

Through this app, people can order food. The app asks for information when ordering to determine the right amount of food depending on the menu: number of people, children or adults, big or small appetite.

Conservation sheet & bar

The conservation sheet allows food to be stored and transported without damaging it. The food is recycled to fuel vehicles (biogas) and to form roads (compost road). The free bar is a place for everyone to share good meals. Rich people bring in leftovers. Meals are shared between the richest and the most disadvantaged in this bar where there is no longer any difference between rich and poor.

Ultrasonic nets & food truck

This team invented plastic waste nets that protect fish: Boats throw ultrasonic nets so that fish are not caught by the net, but it does catch the waste and plastic pollution. They also thought of a shared food truck: a nomadic food truck (like the free nomad library) where people can drop off excess food rather than throw it away and where the poorest can come freely to get food to eat.

RIFFA, BAHRAIN


Latifa Al-Khalifa & Muneera Al-Khalifa
Clever Play

About the hosts:

Clever Play is built on the need to spark, inspire and nurture kids' interest in STEAM in order to build a pipeline of talent through learner-centered skill-building on the FUNdamentals of the 21st Century economy. It offers educational, off-campus encounters with STEAM, which expose students to the kind of immersive, inter-disciplinary project-making that they would otherwise not experience in the classroom.

SAN JOSÉ, COSTA RICA


Johan Murillo & Fabiola Villegas
Lead & Play

About the hosts:

Johan Murillo is the founder and main consultant of LEAD&PLAY, a firm that is empowering leaders to unlock creativity and collaboration to produce vital changes in their organizations and society. With more than 15 years of experience leading strategic initiatives as an industrial engineer in the nonprofit and corporate world, he believes leadership can be designed to transform culture by the power of play.

Fabiola Villegas is an enthusiastic and action-oriented project management professional with 17 years of experience, consistently delivering significant results. Extensive experience in Shared Services, Strategic Planning, Process Transitions from high cost to low cost centers and Improvements projects. Worked with executives as Chief of Staff to lead key programs; ensuring strategic vision translates into successful business outcomes. Team player in a fast-changing environment. She is actively engaged in activities related to promote social awareness and sustainable development goals.

SUNDSVALL, SWEDEN

Mona Wärdell
Tvätteriet

About the hosts:

The GCD 2019 in Sundsvall was led by Mona Wärdell, CEO of Design i Västernorrland. Previously Mona worked as an Interior Designer and Project manager in New York City. Mona is also the manager of a Maker Space called Tvätteriet where she welcomes kids and adults who are curious to learn more about the design process, technology and creativity.

About the event:

Children from the whole region of Västernorrland came together for a full day of creativity. There were 15 amazing volunteers as well as three employees from IKEA to make the most memorable day for all of us! The children came from all kinds of backgrounds and were diverse in almost every sense of the word. The day started at Tvätteriet Maker Space and then moved to Grönborg Presentation hall for presentations in front of a distinguished jury. 22 girls and 9 boys attended in Sundsvall. One of Sundsvalls oldest and most prominent companies, SCA, sponsored the event in Sundsvall.

The Seed picker

This robot has seeds in its belly and moves around and sows everywhere so that there will be more green areas for animals to live as well as more food to eat. It is fueled by waste it picks up while moving around.

The Food Scanner

This is a machine that is programmed to know your personal taste. It scans the food you are about to eat and then adds spices to your liking. The result is that it minimizes the waste by making all food delicious.

Banana package

This package is inspired by the way banana peel protects its fruit. By making packaging from food waste you solve both a waste problem as well as making an ecologically friendly package.

TEL AVIV, ISRAEL

Tami Warshavski & Lila Chitayat

Shenkar - Engineering. Design. Art

About the hosts:

Tami Warshavski is a design visionary and strategist, experienced in running international projects that build new design leadership capacities in the innovation system and the higher education at large. Lila Chitayat is an interdisciplinary designer and architect specializing in spatial storytelling leading an innovative technology based design studio for complex experiential solutions.

About the event:

Tel Aviv joined the GCD event with a young and enthusiastic group of 4th grade kids. Together with a wide array of instructors, the Tel Aviv group established innovative and creative inventions to this years theme. The event was held at toi.lab - a Gallery for toys and electronics, exploring the space between physical and digital. The positive impact of the GCD on the children, their friends, educators and families is still echoing and will lead us to expand the work and involvement in the upcoming years.

UPS - Usable Public Space

Large floating huts, built over existing public spaces create large spaces for urban agriculture and new green parks for cities. Areas such as public swimming pools, boulevards or open streets can now enjoy new green spaces while creating shadow and controlled light for the city. These areas grow fruit and vegetables and become new free parks. They shall be worked by robotic helpers.

Z-Box

This team realised that many kids do not eat their lunch food that they take from home. They either have too much or dislike it while others have too little. The team therefore invented a large smart lunchbox capable of restoring food, heating it or cooling it. The Z-Box can communicate with other boxes letting you swap or provide extra food to whomever is in need while controlling the expiration dates.

Streetobot

An urban robot strolling the streets can provide warm meals to those with difficulty to get one: from homeless people to travelers or people working far from home. The robot is connected to an app detecting restaurants with wasted food and those in need nearby. It is built as a solar powered moving oven, collecting dishes in its belly.

THESSALONIKI, GREECE

Sofia Kantsiou, Ioanna Garefi, Irene Kalemaki
STIMMULI for Social Change

About the hosts:

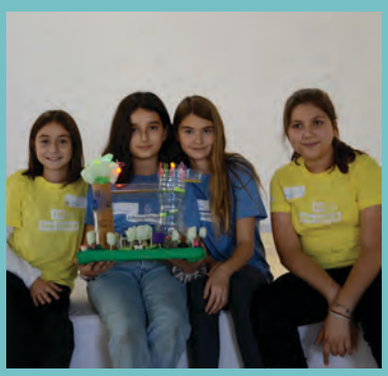
In Thessaloniki the event was organized by STIMMULI, a social innovation research organization that aims at stimulating change in education through motivational, innovative, and social activities. The whole team was really excited about the preparation and organization of the event, where at the end of the day they felt they were one step closer to making children the changemakers of tomorrow.

About the event:

It was a really exciting, creative and playful day for our team and the participating children. The event took place at the Labattoir project, where 23 children participated and engaged in fruitful discussions around their inventions and how they can make the change they want to see in the world. The event would not have been a success if it weren't for the help and support provided by a team of friends and colleagues. Special thanks to: Maria, Xenia, Maria, Nikos, Effie, Stefania, Vasso, Anna, Alex, Nancy, George and Aggelos.

ROBOMELL

ROBOMELL is a robot that stores food and transports it to people in need using her eye scanning sensor. She keeps the food fresh and travels long distances by land and sea, consuming solar energy.



The hanging gardens of Babylon

The hanging gardens of Babylon consist of areas for growing crops and livestock farming, and also buildings used for activities that consume the produced products.

Staz

Staz is a remote-controlled truck carrying leftover food to families in need.

TUNIS, TUNISIA

Houda Ghozzi
Medina Works Tunis

About the hosts:

Houda is an education and entrepreneurship expert with 10+ years experience in academic teaching, curriculum design and project management. She is program director of the Open Start-up Competition Tunisia (OST) in partnership with Columbia university and specialized in developing impact ventures using technology to solve global problems. Medina Works focuses on having youth thrive locally.

About the event:

Medina Works is partnering with Designathon Works for the third year by hosting the GCD in Montreal and Tunis. There are two great teams of facilitators (social innovators, educators, tech professionals) who are all passionate about the event. Medina Works is very excited as they know from previous experience that the team will get to collaborate with great co-facilitators, to connect with like-minded hosts from around the world and most of all, to work with children who always amaze them with their creativity and inventions. Let's Designathon!

WARSAW, POLAND

Agata Raczewska & Sabina Białek
Planeta kreatorów

About the hosts:

In Warsaw the event was held by Planeta Kreatorów founders Agata Rączewska and Sabina Białek. Agata is an experienced designer with background in psychology. Sabina has more product design and technological background. They both believe that polish education needs a general redesign putting more focus on 21st century skills, sustainable development and new technologies.

About the event:

In 2019, children from all over Warsaw joined the GCD. Coming from different schools and backgrounds, diverse in age (7-13) and gender they all worked together designing solutions for challenges regarding food and climate change. The event was held in Startberry, a creative space for polish startups and NGOs to grow.

Vacuum-truck

A truck that vacuum-seals and dehydrates food, during transportation from one country to another. It then rehydrates it when it arrives at its destination. The goal is to make food take up less space and get to its destination without getting rotten.

Food Tube

The food tube is a system similar to a subway, just for food. The carriages float in a cooling liquid that is also making it easier and faster to glide from one destination to another. Carriages travel from hub to hub (even under oceans) where they can form new trains that go into certain destinations. Food stays fresh longer and travels faster.

Rotten-to-good food vending machine

A vending machine where you can put in half rotten or broken produce. The machine will detect the broken parts and compost them and make edible dishes (e.g, juices) from the good parts. It will then let anyone (e.g. homeless people) take the good food for free.

ZAGREB, CROATIA

Petra Ravlic, Sanja Novak & Teo Drempetic-Conkic
Designathon Works Croatia



About the hosts:

Petra is a CX consultant and Design Thinker with experience in shaping services in telco and similar industries and facilitating Design Thinking workshops. Sanja is an Associate at the Croatian Ministry of Science and Education with a professional background in finance. Teo is an independent copywriter & visual communication designer who specializes in strategy, concepts, branding and visual identity.

About the event:

Zagreb is happy to be on the Global Children's Designathon map for four years in a row. We strongly believe in the power of individuals to shape a better world, especially the younger generations. We see GCD as a platform that gives them a voice and self-esteem, and equips them with skills and knowledge needed to thrive in the future. Experienced facilitators with backgrounds in design and maker education are a guarantee to get the best out of children's ideas.

Plant Salvation

Initiative that solves the lack of land through a building-machine garden in which plants are grown (some kind of a large, mechanised, multi-story building for plants), and it runs on solar energy. Additionally, people are financially stimulated to plant and take care of the plants through a special mobile app.

'NED'

A self-moving machine that is supposed to deal with the hunger problem. With the help of GPS, it collects unused food going from door to door, of both homes and restaurants, then separates the food that can be used, packs it, and takes it to the ones in need.

Underground Field

This invention tackles the lack of land by growing plants under the ground surface level. Plants are irrigated using rainwater and absorb the energy that comes through solar panels installed above the ground.

THANK YOU!

For reading, sharing or contributing to this report and this research. This research owes everything to the 1.200 children whom participated, the hosts, the researchers, volunteers, facilitators, experts, sponsors, partners and of course team Designathon Works.

But, also a giant thank you to everyone that has helped spread our message, by coming to the launch event, telling others about this report, reading it and passing it on. The purpose of this report is the amplification of the Global Voices of the Next Generation and by handling this report you are an active contributor to this goal.

Let's build a better future together!
Designathon Works

EMER BEAMER
Founder

Ina Conkic
Creative director

Anne Sallaerts
Managing director




Showcasing the 2018 report: Global Voices of the Next Generation on: Deforestation.
Left to right:
Luan Jorres de Moraes, 18 years, founder Arbo project, Brazil
Nancy Sumari founder and executive director of the Neghesti Sumari foundation and The Jenga Hub
Victor Ye, 17 years, Founder of InnovaYouth, Los Angeles
Touria Meliani the Local Minister of Culture and the Digital City in Amsterdam

Children during the GCD 2019 from left-top to right-bottom; Istanbul, Beijing, Zagreb, Chennai, Oranjestad, Geneva, Daloa, Nairobi, Montreal, Dar es salaam, Accra, Johannesburg, Amsterdam, Hanoi.

REFERENCES

Amabile, T. M. (2013). Componential Theory of Creativity Working Paper-Harvard Business. 17(2018), 12-096.

Boleto, R. (2019) Climate change: 'Adults need to do more!'. Retrieved from: https://www.bbc.co.uk/newsround/48965605

Bregman, R. (2019) Humankind. Little, Brown and Company

Broadbent, E., Gougoulis, J., Lui, N., Pota, V. & Simons, J. (2017) Generation Z: Global Citizenship Survey. What the World's Young People Think and Feel, 26-44.

Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. Psychological bulletin, 140(4), 980.

Clark, H., Coll-Seck, A. M., Banerjee, A., Peterson, S., Dalglish, S. L., Ameratunga, S., [...] & Claeson, M. (2020) A future for the world's children? A WHO–UNICEF–Lancet Commission. The Lancet, 395, 605-658.

FAO (n.d.) (1) Key facts and findings. Retrieved from: http://www.fao.org/news/story/en/item/197623/icode/

FAO (n.d.) (2) Food loss and food waste. Retrieved from: http://www.fao.org/food-loss-and-food-waste/en/

Fridays For Future (n.d.) (1) About #FridaysForFuture. Retrieved from: https://fridaysforfuture.org/about

Fridays For Future (n.d.) (2) Statistics/Graph. Retrieved from: https://fridaysforfuture.org/statistics/graph

McGinley, C. (2019) Children are more concerned about climate change than anything else, study finds. Retrieved from: https://www.goodhousekeeping.com/uk/news/a29531861/children-climate-change-concerns-smart-energy-survey/

Rieckmann, M. (2017) Education for sustainable development goals: Learning objectives. UNESCO Publishing

Ritchie, H. (2019) Food production is responsible for one-quarter of the world's greenhouse gas emissions. Retrieved from: https://ourworldindata.org/food-ghg-emissions

Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G. & Fuller, G. (2019) Sustainable Development Report 2019. New York: Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN)

The Ocean Cleanup (n.d.) About. Retrieved from: https://theoceancleanup.com/about/

UN (n.d.) (1) Zero Hunger: Why It Matters. Retrieved from: https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/2.pdf

UN (n.d.) (2) Goal 12: Ensure sustainable consumption and production patterns. Retrieved from: https://www.un.org/sustainabledevelopment/sustainable-consumption-production/

UN (2019) UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'. Retrieved from: https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

World Population Review (2017) Human Development Index (HDI) by Country. Retrieved from: http://worldpopulationreview.com/countries/hdi-by-country/

APPENDICES

Appendix 1: Content Knowledge Scores

Questions asked to test for content knowledge:

Prior to the event:

Question 1: World hunger is because there is not enough food for everyone.
Options: (1) True, (2) False, (3) I don't know

Question 2: It takes more land to grow meat than it does to grow plants.
Options: (1) True, (2) False, (3) I don't know

Question 3: Growing meat is bad for the climate.
Options: (1) True, (2) False, (3) I don't know

Figure A1:
Normalised score for content knowledge at baseline across HDI groups

	Mean	Standard deviation	Frequency
Low HDI	0.44	0.30	69
Medium HDI	0.42	0.33	285
High HDI	0.42	0.32	92
Very High HDI	0.44	0.32	427
Total	0.43	0.32	873

After the event:

Question 1: Which do you think is true?
Options: (1) World hunger is because we do not have enough food for everyone, (2) World hunger is because a lot of food is wasted, (3) World hunger is because there are too many people on the planet.

Question 2: More animal farming causes more global warming.
Options: (1) True, (2) False, (3) I don't know

Question 3: Eating plant based food is better for the environment than eating meat.
Options: (1) True, (2) False, (3) I don't know

Figure A2:

Normalised score for content knowledge at endline across HDI groups

	Mean	Standard deviation	Frequency
Low HDI	0.44	0.21	67
Medium HDI	0.64	0.30	287
High HDI	0.70	0.32	92
Very High HDI	0.70	0.28	397
Total	0.66	0.30	843

Figure A3:

Comparison of score for content knowledge at baseline and endline

	Baseline			Endline			
	Mean	SD	Total	Mean	SD	Totalp	score
Total score	0.43	0.32	835	0.66	0.30	835	<.05

Appendix 2: Changemaker Abilities

Questions asked to test for changemaker abilities:

Confidence: How confident are you about solving food and climate problems?

Figure A4:

Normalised score for confidence levels at baseline across HDI groups

	Low HDI (%)	Medium HDI (%)	High HDI (%)	Very High HDI (%)	Total (%)
Very much	71.7	51.4	50.5	36.6	45.4
A little bit	24.5	40.9	37.4	48.8	43.3
Not really	3.8	6.6	9.9	12.9	9.9
I don't know	0	1	2.2	1.7	1.4
Total	**100**	**100**	**100**	**100**	**100**

Figure A5:

Normalised score for confidence levels at endline across HDI groups

	Low HDI (%)	Medium HDI (%)	High HDI (%)	Very High HDI (%)	Total (%)
Very much	74	48.8	70.7	45.7	51.4
A little bit	26	42.9	21.7	46	40.9
Not really	0	7	6.5	6.6	6.3
I don't know	0	1.4	1.1	1.6	1.4
Total	**100**	**100**	**100**	**100**	**100**

Figure A6:

Comparison of score for confidence levels at baseline and endline

	Baseline			Endline			
	Mean	SD	Total	Mean	SD	Total	pscore
Confidence level	0.22	0.23	780	0.19	0.22	780	<.001

Concerns: How worried are you about food and climate problems?

Figure A7:

Comparison of score for concern levels at baseline and endline

	Baseline			Endline			
	Mean	SD	Total	Mean	SD	Total	pscore
Concern level	1.62	0.97	798	1.41	0.73	798	<.05

Empathy:

Question 1: You and some of your friends are talking about a problem one of your friends has. What will you do? Pick one.

Question 2: I know when my friend is feeling happy.

Figure A8:

Normalised Empathy score

	Mean	Standard deviationF	requency
Total	0.72	0.23	867

Figure A9:

Normalised Empathy score across gender

	Boys			Girls			
	Mean	SD	Total	Mean	SD	Total	pscore
Empathy	0.68	0.23	412	0.75	0.22	427	0.000

Collaboration: Five questions, depicted below.

no.	Question / Options	N	%
Q1:	Did you ask for and share ideas with your team? (Choose one option)		
a.	Yes a lot	631	76.2
b.	A few times	168	20.3
c.	Not really	29	3.5
	Total	828	100
Q2:	How well do you think your team worked today? (Choose one option)		
a.	We achieved some but not all of our goals	159	19.2
b.	We met our goals but could have done much better	236	28.5
c.	We efficiently achieved goals that we set for ourselves	258	31.2
d.	We went way beyond what we had to do exceeding even our own goals	175	21.1
	Total	828	100
Q3:	Pick one		
a.	I was happy working with my group	768	93.1
b.	I wanted to be in another group	29	3.5
c.	It would be nice if I could work by myself	28	3.4
	Total	825	100
Q4:	Did everyone in your team contribute? (Choose one option)		
a.	Nobody did anything until our teacher asked us to	39	4.7
b.	One person did all the work	19	2.3
c.	A few group members did all the work	96	11.6
	The work was equally shared by all members	672	81.4
	Total	826	100
Q5:	Did you enjoy working with your group today? (Choose one option)		
a.	Yes	743	91.4
b.	A little bit	53	6.5
c.	Not really	17	2.1
	Total	813	100

Appendix 3: Assumptions of impact numbers explained

Of the 60,000 children reached, 25,000 are directly reached, and 35,000 children are reached through a snowball effect stemming from teachers/facilitators/people that use the designathon method after the training in their class or other activities. To calculate the number of children reached through a snowball effect, we have made several assumptions explained here:

- It is assumed that teachers that are fully trained give a designathon at least once a year for the five years after they are trained. It is also assumed that there are 27 children participating per designathon on average.
- It is assumed that 40% of the teachers that are trained in a micro-designathon give a designathon at least once a year for the two years after they are trained. It is also assumed that there are 17 children participating per designathon on average, as these are either after-school courses/ programs, or other special school programs.
- It is assumed that 33% of the teachers that are fully trained give a designathon at least once a year for the five years after they are trained. It is also assumed that there are 27 children participating per designathon on average.
- It is assumed that 40% of the people that are trained in a masterclass give a designathon at least once a year for the two years after they are trained. It is also assumed that there are 17 children participating per designathon on average, as these are either after-school courses/programs, or other special school programs.
- It must be noted that in some cases, the same children participate in a designathon from the same teacher multiple times.
- It is assumed that during a designathon workshop children work in teams of 3, meaning every group of 3 makes one invention.
- It is assumed that during a GCD workshop there are, on average, 6 volunteers present.

Over the last few years it has become evident that not only adults are able to ignite change: young people have shown a huge concern for social and environmental issues and are increasingly taking part in the debate.

As adults, we have a duty to provide these children with an opportunity to join in, by empowering them to take action and by preparing them to prosper in our rapidly changing, technological and globalised world. But most of all, it is necessary to listen to them.

The annual Global Children's Designathon (GCD), initiated in 2014, is a day dedicated to celebrating what the world could be like when children are put in charge of designing better futures for people and planet using new technologies. The Global Children's Designathon 2019 was also the breeding ground for a third edition of research on the global voices of the next generation. Amplification of the voices of young people has been the main motivation behind launching our research initiative and writing the previous two editions of the "Global Voices of the Next Generation" reports (2018: Deforestation, 2017: Water). The GCD 2019 created an opportunity to listen to the voices of over 1,200 children worldwide, about their concerns and solutions to problems around this year's theme: Food and Climate Action.

This research enables us to identify children's perceptions of the issues and how these are handled, how children's attitudes relate to their ability to be a changemaker, and what children propose as solutions to the problems. This report elaborates on the findings that emerged from our global research and showcases more than 100 inventions designed by children aged 7-12.

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