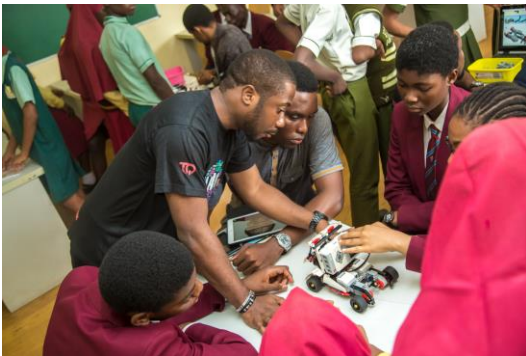

THE 2018 AFRICAN SCIENCE WEEK IN NIGERIA



EXECUTIVE SUMMARY

The 2018 African Science week in Nigeria was a 4-day event led under the aegis of African Center for Innovation and Leadership Development and hosted by **African university for Science and Technology**, Abuja. Over a thousand participants attended the 4-day event. The event was supported and funded by the **Next Einstein Forum** and **Johnson & Johnson**.

The activities from the 4-day event included: Science Debate Competition,

Opening Ceremony, 2-day Boot-camp Workshop, Women in Science Talk show/Award Night and a STEM Road show. The Attendees included: Government representatives from Federal Ministry of Science and Technology, Universal Basic Education Board, Secondary Education Board and the National society of Engineers. Representatives from private organizations such as African Agricultural Technology Foundation, Deloitte Nigeria, Sprout Nigeria Ltd and American West African Agro Ltd were also present. **There were over 800 students from 47 secondary schools across Federal Capital Territory (FCT)** (4 private schools, 26 public schools from the city and 17 public schools from the rural part of FCT) and individuals from all walks of life. There were 25 facilitators from 6 organizations in Nigeria who facilitated the bootcamp workshop and science expo. The Young Women in Science Awards were presented to 4 women between the age range of 18 years and 35 years, who had made significant impact in society through STEM

INTRODUCTION



INTRODUCTION OF COUNTRY BACKGROUND AND SCIENCE WEEK RATIONALE

Science education is very important in the development of any nation in many areas. Science and technology will not be possible without science education¹. The current situation is such that science teaching and learning ranging from elementary level to the university level are handled as an exercise in the abstract due to inadequately prepared teachers and lack of basic infrastructures. There is also a disconnection and lack of appreciation of the integration of science with society and a poor appreciation the power of science to human developments by Nigerian youths².

The present trend of mass unemployment in Nigeria shows that science and technology education in schools may not adequately prepare Nigerian graduates to function well in society. The courses which should be taught as hands-on and minds-on

practical courses are basically taught theoretically; this makes the learners unable to benefit maximally from their education. Hence, development of useful skills necessary for self-reliant living is lacking.³ Emphasis should be put on effective science education to help lay the needed foundation starting from the primary to, at least, the first year of the tertiary level for students⁴. It is critical for science and technology education to be practical and pragmatic, which was one of the major rationales for the organization of the African Science Week in Nigeria. The four-day event was led by the African Centre for Innovation and Leadership Development, a non-governmental development NGO based in Abuja, Nigeria in partnership with the African university for Science and Technology. One of the primary aims of the African Science Week was to expose students to practical aspects of science and technology and inspire them to a world practical application in STEM that are beyond the walls of their classrooms.

The 2018 Next Einstein Forum's African Science Week in Nigeria took place in Abuja, October 23 - 26, 2018 and comprised six events:

- Event 1: Pre-science debate competition
- Event 2: Opening Ceremony/Science Debate Competition
- Event 3: 2-Day Bootcamp Workshop
- Event 4: Science Expo
- Event 5: Women in science talk show
- Event 6: STEM road show

¹Aina Jacob Kola, 2013. Development. American Journal of Educational Research. 2013, 1(7), 225-229
doi:10.12691/education-1-7-2

²Aina, J.K. 2012. Challenges and prospects of primary science teaching in Nigeria. Continental J. Education Research, 5(2), 32-37

³Suleiman Sa'adu Matazu, 2010. The Relevance of Science, Technology and Mathematics Education (STME) in

Developing Skills for Self Reliance: The Nigerian Experience. *African Journal of Teacher Education*. Volume 1, No 1. ISSN 1916-7822

⁴Grace Malachi Brown, 2015. Science and Technology Education in Nigeria: A Historical Perspective. *SCSR Journal of Educational Research (SCSR-JER)*. Volume 1, Issue 1, pp 33 - 41. www.scholarconsult.com



EVENT 1: PRE-SELECTION SCIENCE DEBATE COMPETITION

The first event was the Science Debate Competition, which took place at Government Secondary School, Wuse zone 3, Abuja on October 23, 2018. The event started at exactly 10:00 am and ended at 3:25pm. The pre-selection science debate competition was among 10 selected secondary schools from the 6 area councils in Federal Capital Territory, FCT-Abuja, Nigeria. The debated topics comprised the following:

1. *Artificial Intelligence (AI) has more positive effects than negative effects on society*
2. *Religion and science can co-exist*
3. *Robots have the potential to replace humans*
4. *Science and Technology has done more harm than good for the society*
5. *Technology today: a blessing to society*

The schools that participated in the pre-selection competition included:

- ❖ Government Secondary School, Wuse 3: 4 students
- ❖ Government Secondary School, Tundu Wada: 8 students
- ❖ Government Secondary School, Garki: 4 students
- ❖ Government Day Secondary School, Wuse 2: 7 students
- ❖ Government Day Secondary School, Karu: 4 students

- ❖ Government Day Secondary School, Dutse: 16 students
- ❖ Government Secondary School, Kubwa: 10 students
- ❖ Government Secondary School, Gwagwalada: 4 students
- ❖ Government Secondary School, Zuba: 4 students
- ❖ School for the Gifted, Gwagwalada: 4 students



There were 65 students present from the 10 Schools, 10 teachers, 4 panelists, 1 time keeper and 15 other attendees. In total, there were 95 attendees (62 female: 33male). The participated students were between the age groups of 12 years and 15years while the teachers were between the ages of 30 years and 51 years.

At the end of the 3 rounds of debate, 2 schools qualified for the final round of the debate competition:

- ❖ Government Day Secondary School Duste, Abuja.
- ❖ Government Secondary School Kubwa, Abuja.

The names of the Panelists included:

1. Mr Morgan Leo: The head of Environmental Sciences, African University of Science and Technology
2. Nnyaba Ukamaka: PHD Student (Mathematics), African University for Science and Technology
3. Engineer Olaoluwa Alabi: Bachelor of Engineering (B. Engr.)
4. Olorunfemi Mercy: Program Manager, Enspire Hub



Students giving their different opinions at the Pre-selection Competition

EVENT 2: OPENING CEREMONY/SCIENCE DEBATE COMPETITION

This event took place at the African University for Science and Technology on October 24, 2018. The event started at 9:30am and ended at 11am.

The opening ceremony included representatives from the Federal ministry of science and technology and the federal ministry of education.

The guest speaker was Mr Joledo Oyewole (CEO & President, Servant Leadership Brand; CEO Kingsman Accessories; Scientific Officer at National Biotechnology Development Agency). He spoke on the theme of the event; **STEM Education: A lifeline for National Development.**

We also had the final round of the science debate competition between Government Day Secondary School, Duste and Government Secondary School, Kubwa. The debate topic was: **Robots have the potential to replace humans.** Prizes were presented to 3 the schools in the following categories:

- ❖ Government Day Secondary School Duste, Abuja 1st Prize.
- ❖ Government Secondary School Kubwa, Abuja 2nd prize.

- ❖ Government Secondary School Zuba, Abuja. 3rd prize.

Special guests present at the event included:

1. Mr Faisal
STEM Unit,
Secondary Education Board
2. Mr Janilu Hassan
Senior Officer,
Department of Science and Technology
Promotion
Federal Ministry of Science and Technology
3. Mr. Francis Onyekachi
Program Manager,
African Agricultural Technology Foundation
in Nigeria.
4. Professor Kingston Nyampfene.
President,
African University for Science and
Technology.
5. Mr Dunia Agaba
CEO STEM,
Universal Basic Education Board

Over 400 participants were present at the opening ceremony/science debate competition.



Students from different schools



Judges, L-R: Olugbogi Tolu, Olorunfemi Mercy, Dr Morgan Leo and Nnyaba Weamaka.

EVENT 3: TWO-DAY WORKSHOP

The Bootcamp Workshop was a two-day event which took place on October 24 and 25 at African University for Science and Technology, Galadimawa, Abuja. The students were allocated to different workshop classes according to their schools. We had 6 workshop classes in all.

STEM WORKSHOP BOOT-CAMP: DAY 1

124 students from 12 schools participated in the Bootcamp/Workshop. These included:

- Sascon International School, Maitama: 10 students
- Junior Secondary School, Pyakasa: 10 students
- Government Secondary School, Gwagwalada: 10 students
- Brickhall International School: 8 students
- Government Secondary School, Garki, Abuja: 10 students
- Kingsville College Jabi, Abuja: 10 students
- Government Secondary School Kubwa, Abuja. : 10 students
- Government Girl's Secondary School Duste, Abuja: 16 students

- Junior Secondary School, Aleta: 10 students
- Junior Secondary School., Area 11: 10 students
- Junior Secondary School, Kuchingoro: 10 students
- Government Secondary School, Zuba: 10 students

The Workshop Courses include:

1. **Robotics:** The Robotics workshop was led by Techquest. Participants were provided with robotics kit sets which offered plenty of scope for robot building challenges. The challenge involved a race of some type, robots that use sensors to find something, a test of strength or building a robot that responds to some form of human input. As well as designing the robots.
2. **Digital electronics**
This workshop was led by Techquest. The participants were provided with brilliant electronics set which they used to explore electricity. They learnt how circuits work and were able to build some projects at the end of the workshop.

3. **Game design and animations: Scratch**
This workshop was led by Techquest. Scratch was used to introduce the participants to programming. This workshop was in two classes. The students learnt the basic concepts of programming which helped in opening their mind, imagination and intellectual capacity to creating animations.
4. **Product Science**
This workshop was led by NINE. The participants learnt how substances are formed through chemical reactions.
5. **Web Technology**
This Workshop was led by NINE. The participants were introduced to different languages and multimedia packages that are used in conjunction with one another, to produce web site.

139 attendees⁵ were present at the workshop Day 1 which include 124 students and 15 teachers within the age group (75 females: 64 males)



STEM WORKSHOP BOOT-CAMP: DAY 2

STEM Workshop Boot-camp: 166 Students from 16 schools participated:

1. Sascon International School, Maitama: 10 students
2. Junior Secondary School, Pyakasa: 10 students

3. Government Secondary School, Garki, Abuja: 10 students
4. Kingsville College Jabi, Abuja: 10 students
5. Government Secondary School Kubwa, Abuja: 10 students
6. Government Girl's Secondary School Duste, Abuja: 16 students
7. Junior Secondary School, Aleta: 10 students
8. Junior Secondary School., Area 11: 10 students
9. Government Day Secondary School- karu: 10 students
10. Junior Secondary School, Garki: 10 students
11. Junior Secondary School, Durumi 1: 10 students
12. Government Secondary School, Wuse Zone 3: 10 students
13. Olumawu College Wuse, Abuja: 10 students
14. Junior Secondary School, Kuchingoro: 10 students
15. Government Secondary School, Zuba: 10 students
16. Junior Secondary School., Area 1: 10 students

Workshop Courses:

- **Robotics**
Robotics: The Robotics workshop was led by Techquest. Participants were provided with robotics kit sets which offered plenty of scope for robot building challenges. The challenge involved a race of some type, robots that use sensors to find something, a test of strength or building a robot that responds to some form of human input. As well as designing the robots.
- **Digital electronics**
This workshop was led by Techquest. The participants were provided with brilliant electronics set which they used to explore electricity. They learnt how circuits work and were able to build some projects at the end of the workshop

⁵ The total number of attendees including guest were approximately 245

- **Game design and animations: Scratch**
This workshop was led by Techquest. Scratch was used to introduce the participants to programming. This workshop was in two classes. The students learnt the basic concepts of programming which helped in opening their mind, imagination and intellectual capacity to creating animations.
- **Introduction to Data Science and Artificial Intelligence**
This workshop was led by Curators University. The participants were introduced to data science and artificial intelligence after hearing their views. Various career opportunities in the field were explored and how the knowledge of data science and artificial intelligence is relevant to our contemporary society. Continuous changes in the science and technology world was also explored by the students. To crown it up, R and Python Programming language were introduced to the students as they began their journey to data science and artificial intelligence.
- **Nutrido: Gamification of Nutrition**
This workshop was led by African Center for Innovation and Leadership Development. The participants provided with a variety of nutrition-based board games, which they played in groups of four. Through playing various games, they got to know the importance

of healthy meals and the negative implications of choosing unhealthy meals.

Students had the option to design a game that could influence behavior towards healthy eating. They also worked through how to tell their personal nutrition stories in such a way that it influences good nutrition behavior among their peers.

- **Eyes and Ears on the Ground: The Geophysical Science of Locating the Source of Abuja Tremors**
Led by Dr Tolu Olugbogi, NEF Fellow

Partner Organizations for Workshop and Science Expo (Facilitators included):

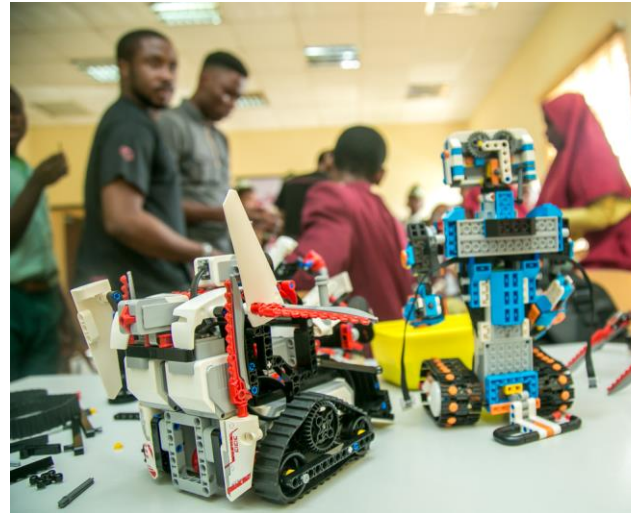
- Techquest Camp
- WAAW Foundation
- E_Concept
- Curators University
- Network of Incubators & Innovators in Nigeria
- NutridoTM company

In total we had 186 students⁶ and teachers at the bootcamp workshop day 2 (98 Female: 88 Males). Attendees were within the ages 12 years and 50 years.

⁶Total number of attendees including guests was approximately 250



Students building robots with the kits provided to them



Robots built by students

EVENT 4: SCIENCE EXPO

This event took place on October 24, 2018 at African University for Science and Technology, Galadimawa Abuja. We had 90 students from 9 schools participated in the Science Expo on the following topics:

1. Renewable energy using wind turbine and solar panel

This was led by WAAW Foundation. The participants learnt how to generate power using solar energy and wind energy. The students were allowed to give the demonstration at the end of the class where they generate power that could light a LED bulb, pump water using the pressure pump and charge a phone.

2. Sound mechanics

This was led by E-Concept. The participants learnt about sound waves and how to generate it, the importance of sound and how to set up a simple address system.

3. 3D printing

This class was led by NINE. The participants were provided with 3D Printing Machine and 3D objects models. The students were put through the process of printing in 3Ds. They were able to create their 3D objects at the end of the class.

4. Arduino Programming

This was led by WAAW Foundation. The computer programming session was facilitated by Michael Onimi on Arduino programming, a fun and innovative approach for programming Microcontrollers which was used to design a mini project on traffic light and a push button LED circuit.

5. Eyes and Ears on the Ground: The Geophysical Science of Locating the Source of Abuja Tremors

This was led by Dr Tolu Olugbogi (NEF Fellow)

6. Nutrido: Gamification of Nutrition

This was led by the Nutrido team. The participants were provided with a variety of nutrition-based board games, which they played in groups of four. Through playing various games, they got to know the importance of healthy meals and the negative implications of choosing unhealthy meals. Students had the option to design a game that could influence behavior towards healthy eating. They also worked through how to tell their personal nutrition stories in such a way that it influences good nutrition behavior among their peers.

Participating Schools Included:

- Government Day Secondary School- karu: 10 students
- Junior Secondary School, Garki: 10 students
- Junior Secondary School, Durumi 1: 10 students
- Government Secondary School, Wuse Zone 3: 10 students
- Junior Secondary School, Area 1: 10 students
- Olumawu College Wuse, Abuja: 10 students

- Junior Secondary School: 10 students
- Junior Secondary School, Apo: 10 students
- Junior Secondary School, Galadimawa: 10 students

In total we had 99 participants⁷ at the science expo which include 90 students and 9 teachers within the age group of 12 years and 50 years (53 Female: 46 Males)



Expo by WAAW Foundation renewable energy using wind turbine



Students creating Animations with Scratch

EVENT 5: WOMEN-IN-SCIENCE AWARD NIGHT/ TALKSHOW

The women-in- Science Talkshow/Award Night took place at Banquet Hall, National Center for Women Development, Central area, Abuja on October 25, 2018. It was an evening event which started at exactly 5:30 pm. We had four young women who were awarded the 'Young Women in Science' and three female speakers who are making significant impact in the society through STEM. Some of the

guests included Jerry L. Cunningham (Managing Director, American West African Agro LTD), Amarachi Asonye (Deloitte Nigeria), Victoria Agbo (Head, Department of WIS African University for Science and Technology), Mr Joledo Oyewole (CEO & President, Servant Leadership Brand), Dr Hallowed

⁷Approximate number of total attendees was 125

Olaoluwa (NEF Fellow), Dr Olugbogi Tolulope (NEF Fellow).

Society seems to tacitly discourage the further inquest of women into science as a discipline, and although the idea that new grounds are being covered in science by women, there is need for more young women to step up the plat. Damilola Anwo-Ade, one of the guest speakers and awardees for the night spoke on *Encouraging Women in science*. Mrs Damilola has been at the forefront of advocating for women in the science and technology space. She is the co-founder of CodeIT, the managing partner at Sprout Digital Development Limited and a strong advocate for promoting ICT skills amongst kids. Engr. Igwegbe Nnenna Chinyere, one of the guest speakers spoke on *'Too few Nigerian Women in Science: Way Forward'*. She is the current National Vice Chairman of the Nigerian Institution of Water Engineers, a Principal Partner with Krumberg Engineering Limited and a Board Member. Consultant at Verte-Lopin Limited /Krumberg Engineering Limited. The third guest speaker, Miss Theresa Ezenwafor indicated that there are social factors and responsibilities that make peculiar demands from women such as marriage & motherhood thereby making it extremely difficult for the female and their male counterparts to compete evenly in the field of science. Women, therefore, need to develop the right mindset amidst gender disparity, unequal employment, career opportunities and other sundry contemporary issues that women are faced with in the society at large. Miss Theresa Ezenwafor was a student speaker from the African University of Science and Technology Galadimawa, Abuja. She spoke on *Strengthening Women hood in science*.

For the panel discussion, 2 Next Einstein Forum fellows: Dr Hallowed Olaoluwa and Dr Tolu Olugbogi joined the speakers to entertain and give answers to questions from the audience. It was discussed that men who support women in science must be encouraged. Women need positive affirmations because there needs to be a shift in the

mentality traditionally, religiously and economically.

The event was partly sponsored by National Center for Women Development (by giving 40% discount for the hall worth ₦200,000) and Department of WIS, African University for Science and Technology, headed by Miss Victoria Agbo (Supported the event with 4 Award Plaques worth ₦68,000 which were given to the awardees).

Awardees included:

- Yetunde Salau:
Yetunde is a program manager at TechQuest who is passionate about STEM. This can be seen in her work at TechQuest. While been program manager she has ensured that over 8,000 students have been introduced to STEM, 80% of which are from economically challenged areas and attended for free. She has a passion for capacity building for kids, this can be seen in the work she does for TechQuest. TechQuest is a not for profit focused on capacity building for kids ages 6 to 16. She has spent the last two years helping them achieve their target of training 1,000,000 kids by 2020.
- Lucy Ikpesu
Ikpesu E. Lucy holds a bachelor's degree in Chemical Engineering from Delta State University, Nigeria. She is a Science, Technology, Engineering and Mathematics (STEM) Trainer and Adolescent Girls and Young Women Advocate. Lucy currently serves in WAAW Foundation as the STEM Trainer; She is responsible for creating and updating STEM curriculum. Lucy's passion is focused on promoting STEM education in Nigeria especially for student to guild and engages them in the science field and to increase the pipeline of girls' interest in the Science and Technology.
- Ebimoboere Enyiekemi

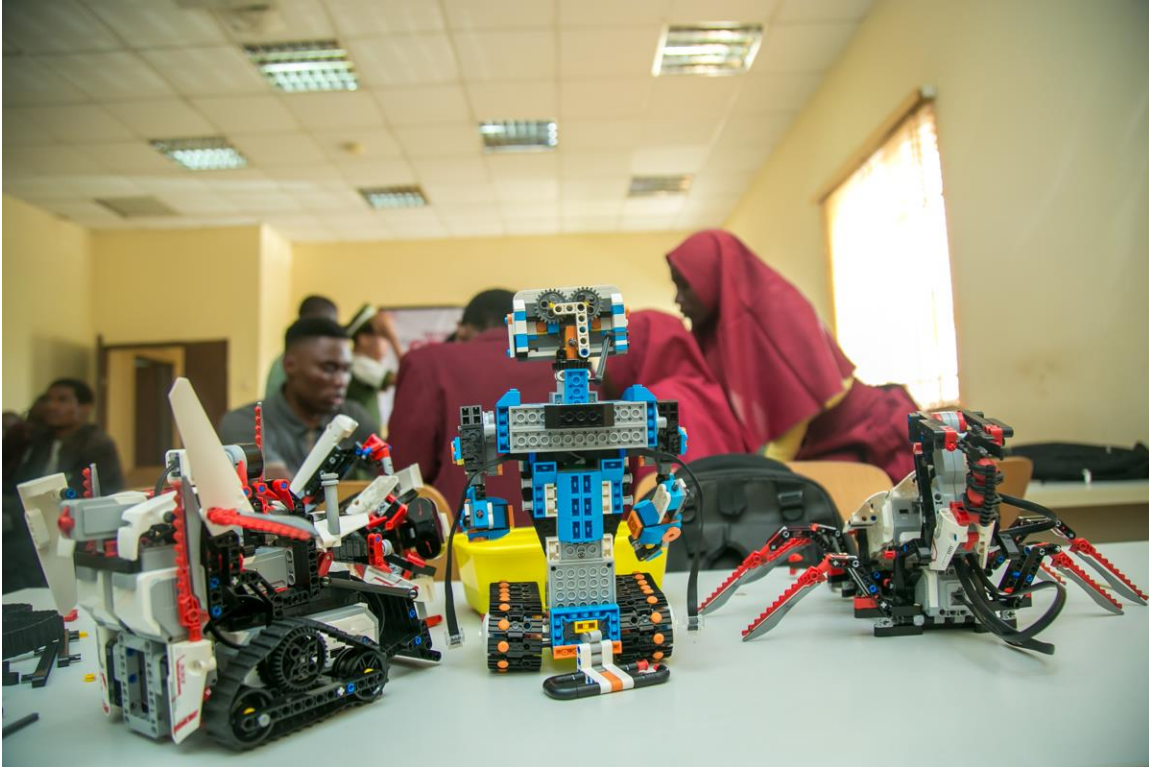
She is currently the CEO and Managing Director of Afritropic Farming and Agro Services Limited. She studied Plant Science and Biotechnology at the University of Port-Harcourt. She received her training in Tissue Culture and Molecular Genetics at The National Centre for Genetic Resources and Biotechnology (NAGRAB) Ibadan, to aid her research on plant technology to improve crop quality and yield. She is currently working with the Delta State government to train youths in mechanized Agriculture and set

them up in all senatorial districts through the Accelerated Agricultural Development Scheme (AADS).

- Damilola Ade Anwo
A project and IT manager; she was recently honored by the U.S Embassy in Abuja, as one of Nigeria Tech women fellows with her initiative-CodelT, Damilola is mentoring the next generation of young coders including women.



Panelists addressing questions from the audience (Panelists L-R: Dr Olaoluwa Hallowed, Engineer Nnenna Igwegbe, Damilola Anwo, Miss Theresa Ezenwafor and Dr Olugbogi Tolulope)



EVENT 6: STEM ROAD SHOW

This event took place at Government Secondary School, Gwagwalada, FCT-Abuja on October 26, 2018. All facilitators and organizers met at Wuse 2 at 7:30 am, and we took off in a coaster bus to Government Secondary School, Gwagwalada.

There were 255 Students from 17 Schools in the rural part (Kwali, Gwagwalada) of FCT participated in the following Expo:

1. Relevance of mathematical modelling and relevance to everyday life
This was led by Hallowed (NEF Fellow)
2. Renewable energy using wind turbine and solar panel
This was led by WAAW Foundation. The participants learnt how to generate power using solar energy and wind energy. The students were allowed to give the demonstration at the end of the class where they generate power that could light a LED bulb, pump water using the pressure pump and charge a phone.
3. Sound mechanics
This was led by E-Concept. The participants learnt about sound waves and how to generate it, the importance of sound and how to set up a simple address system
4. Arduino Programming
This was led by WAAW Foundation. The computer programming session was facilitated by Michael Omimi on Arduino programming, a fun and innovative approach for programming Microcontrollers which was used to design a mini project on traffic light and a push button LED circuit.
5. Nutrido: Gamification of Nutrition
This was led by African Center for Innovation and Leadership Development. The participants provided with a variety of nutrition-based board games, which they played in groups of four. Through playing various games, they got to know the importance of healthy meals and the negative implications of choosing unhealthy meals.

Students had the option to design a game that could influence behavior towards healthy eating. They also worked through how to tell their personal nutrition stories in such a way that it influences good nutrition behavior among their peers.

- 6. Robotics: The Robotics Expo was led by Techquest. Participants were provided with robotics kit sets and already built robots. The students learnt how robots are designed and how they work.

Some of the participating schools included:

- Junior Secondary School - Kwali
- Junior Secondary School - Giri
- Government Secondary School- Tunga
- Junior Secondary School- Bako
- Government Secondary School - Dobi
- Government Secondary School - Yangogi
- Government Secondary School - Hajj Camp
- Junior Secondary School -Gwako
- School of the Gifted - Gwagwalada

- Junior Secondary School- Sheda
- Junior Secondary School - Dafa
- Junior Secondary School- Sabon Gari
- Government Day Secondary School- Gwagwalada
- Government Girls Secondary School- Dukpa
- Junior Secondary School - Gwagwalada
- Junior Secondary School Yangogi
- Junior Secondary School, Hajj Camp

In total, we had 308 attendees which includes Students, teachers, facilitators and the committee (162 Females: 146 Males) within the age group of 11 - 55 years.

Partner Organizations for Roadshow (Facilitators):

- Techquest Camp
- WAAW Foundation
- E_Concept
- Nutrido



TechQuest setting up the robots



Dr Hallowed Olaoluwa speaking to students

5. MEDIA

2018 Next Einstein Forum's African Science Week in Nigeria:

<https://www.nairaland.com/4778809/2018-next-einstein-forums-african>

African Science week 2018 - Nigeria:

<http://waawfoundation.org/2018/10/30/african-science-week-2018-nigeria/>

It's time for Nigeria to grow economy through science and tech:

<https://www.eventbrite.com/e/2018-nef-african-science-week-in-nigeria-women-in-science-talk-show-award-night-tickets-50902266048>

2018 NEF African Science Week: Experts Advocate Govt Investment in Innovative Hubs

<https://leadership.ng/2018/10/30/2018-nef-african-science-week-experts-advocate-govt-investment-in-innovative-hubs/>

2018 NEF African Science Week in Nigeria:

Women-in-Science Talk show/ Award Night:

<https://www.dailytrust.com.ng/its-time-for-nigeria-to-grow-economy-through-science-and-tech.html>

Highlight from African Science Week Nigeria:

<https://youtu.be/vLlEul@gp5A>

2018 Next Einstein Forum's African Science Week in Nigeria:

<http://www.rexcharlesblog.com/2018/10/2018-next-african-science-week-einstein.html>

Why Nigeria Needs More Women in Science and Technology -Dr Obidimma Ezezika

<https://paparazzipressng.com/2018/10/26/why-nigeria-needs-more-women-in-science-technology-dr-obidimma-ezezika/>