REPORT ON THE
FACES OF
DEVELOPMENT
STEAM CAMP

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1 Introduction

The objective of the camp was to provide young people with skill sets using Science, Technology, Engineering, Art, and Math (STEAM), to improve academic performance and broaden options for career planning and gainful employment using community resources to establish teaching and learning models.

The Faces of Development Foundation was established in 2019. The group aims to identify issues and work with community groups and other community institutions and interested persons to provide solutions to the community of Dennery, including the Dennery Village, La Caye, Lumiere and all the communities which make up the Mabouya Valley. The community development group has explored the negative impact of the COVID19 disease on the poor, particularly the children and adolescents in poor families. The proposed initiative will build capacity among children and young people residing and or attending school in these communities.

The Foundation examined alternatives to the development framework of the community in 2019. In that year FoD staged a youth symposium and a youth summer camp. The youth Symposium consisted of a series of presentations on the various aspect for creating sustainable and dignified jobs in the community linked to the community economic drivers and resources. The main themes were: The green economy; The blue economy; sports; legal aspects of creating new jobs and an examination of organizational structures that would help foster sustainable job creation. The introduction of a STEAM approach to enhancing academic performance and support for innovation and job creation, represents the next stage to shaping an effective sustainable development model for the community.

The first year of the camp was intended to expose the camp assistants and the young people to problem solving, using reasoning and proof. The camp assistants were volunteers from the communities. Further, the camp aimed to have children enjoy science and have fun while seeing what science can do. Ultimately the camp was seen as a vehicle for sustainable community development. Ultimately the camp would enable the participants to acquire skills while engaging in STEAM content, connected to community resources, improving their academic performance and broadening their options for career planning and gainful employment.

The children were presented with various topics in STEAM and there were various question and answer sessions. Career professionals from various areas of STEAM were invited to meet, the children and introduce them to the various aspects of Science, Technology, Engineering and Mathematics. Campers were placed into groups based on age. Each group completed
assignments and then presented the group contributions to their peers using several communication mediums such as written reports, art, song and dance.
2 Preliminary Camp Preparation.

The STEAM camp was initiated by drafting a proposal and communicating with proposed sponsors. The proposal was sent to at least 15 possible sponsors. Seven sponsors responded and contributed in cash and in kind. The children for the camp were recruited and a suitable safe space was secured. Camp attendants and other volunteers were identified for meal preparation, cleaning, and camp supervision.

Four schools were targeted, Dennery Primary, Richfond Combined, Clendon Mason Secondary. The principals were introduced to the STEAM Camp project, objectives, and outcomes. The principals were very receptive to the idea. They joined the STEAM Camp Team and provided support to the project. The principals were asked to choose 10 students using the criteria as stated in the proposal. 40 students between ages 9 to 14 were selected from primary and secondary school.

The STEAM camp directors met with the students. These meetings were important to communicate to students the nature, objective, and content of the camp. The meetings were held with students from three of the four selected schools. We were not able to meet with students from the Grand Rivierre Secondary school because it was close to exams.

The meetings were very beneficial as they raised enthusiasm for science exploration among the students, showed their preferences of careers and presented new ideas. The meetings
also provided an indication of the aptitude of some of the students. We also learned about their interest and level of participation in extracurricular activities.

The S.T.E.A.M. Summer Camp 2022 was held at the Clendon Mason Memorial Secondary School. The Camp took place for two weeks from July 25th, 2022 - August 5th, 2022.
3 Day 1 – Introduction to STEAM

3.1 Registration and Opening

The first day of Camp started with an opening ceremony. The invitees included representatives from the community, regional education district and parents. The short opening ceremony highlighted the goals and objectives of the camp. The educational aspect and social impact of this type of camp.
Figure 1-Opening day- Presentation by SALCC Dean.
3.2 Impact of STEAM on Everyday Life.

The first topic for the day was what is STEAM and the Impact of STEAM on everyday life. The objective of that session was to engage students and help them understand the areas of STEAM and how it impacts our lives. Topics explored included:

- Science and Technology and the quality of life.
- Aspect of the community impacted by STEAM.
  - Fishing
  - Housing
  - Home appliances
  - Farming
  - Health
- The impact of Science and Technology on education.
- How the internet benefits the children and the Community.
- New areas of STEAM research that the children should be aware of.

The children were then teamed into five (5) groups of ten based on their age group. They were given 5 different topics to discuss issues of STEAM within their community and come up with solutions. They were given material and were allowed to use Creative arts to report on their issues and solutions.
Children understood the topics and showed great interest in the topic. They were very enthusiastic about their presentation. They were very good at infusing the arts in various forms. Some used drawing and painting only, some used songs and dance and some created short skits to dramatize their outputs.
4  **Day 2- Science Related STEAM.**

The objective of this session was to have the children understand what science is and how science applies to our daily life. It was important for them to distinguish between the aspects that refer to science and differences between science Technology and engineering etc. They were also introduced to the various branches of science and what they entail.

5  **Understanding of science.**

Power Point Presentations and interactive discussions were used to present the following aspects of science:

- The Vocabulary of Science
- The logic of science
- The Methods of Science
- The Landscape of Science
- The Ethics of Science.

The children were also given some insight into the processes of science such as the following:

- Theory
- Fact
The learning about science is crucial for providing learners with problem solving skills and teaching them to embrace the quest for knowledge and understanding.

One of the theories that was examined was the Universal Law of Gravitation. They were able to relate very well to the science concepts when life examples were used.

The children were also taught about scientific hypothesis and how the verification of a hypothesis is done through experimentation.

Towards the end of the day there was a group activity where the children were divided into their original groups. They were given questions which would be the basis of their solutions using science. The questions are shown below.

1. Show how you use the three states of Water in your daily life.
2. Show what would do to help preserve the foods shown.
3. Draw and/or build a model to show how gravity works.
4. Create a model on Energy transformation showing one form of Energy changes to another form.
5. Create an environment using drawings and Models where bees can thrive.

The children dealt with the group work very well and made very good presentations. They showed that they were able to relate science with what is happening around them. One of the interesting presentations was the model of a roller coaster which they made. However, when they tried to make the Model work using marbles, it did not work as they expected. On the question of the model not working properly. The reason for the model not working properly was discussed noting that the mathematics and physics needed for the proper functioning was not used.
6  Group Activity Aspects of STEAM Related to The Medical Fraternity.

This activity was intended to demonstrate to the children the link of the base sciences to popular careers in the medical field like Medicine, Nursing, Pharmacy and Dentistry. The opportunity was also taken to expose them to new fields in medicine. For example, Biotechnology, Regenerative Medicine, Biomedical technology etc.

7  Understanding Technology and its Impact on the Community

7.1.1  Presentations by Technologist in the Various Fields.

The Technical fields were chosen based on the Community issues identified and the availability of the technical personnel. The areas chosen were Food Technology, Electrical Technology, Computer and Artificial Intelligence.

The children had correctly identified ways to prevent the spoiling of foods, for example preserving fish using salt and also refrigeration and showed their interest in food technology during previous sessions. This was further enforced in the food science presentation. They were keen on learning about the preservation of foods available in the community. Linking this to science and technology was very important to create a culture of problem solving of community issues, critical and creative thinking and innovativeness.

In term of Electrical and solar energy, they had already identified that that they could use Solar energy to power the fishing boats to replace the gas and diesel engines which are presently being used. The had identified that gas and diesel engines pollute the sea and are possibly partly responsible for the reduction of the fish catch which their parents depend on to make a proper living. There was also concerned about the use of electricity in the home. The children are familiar with the computer, the phone, and robots. What they did not understand was the role of STEAM in the development of the computer, computer applications and electronic automation which is equivalent to Artificial Intelligence. (AI). The children welcomed the presentation. They were able to relate many of the things that they accomplished with their Phones, Tablets and Laptops, (those who have access to one) to the STEAM field.
8 Engineering Related STEAM

The objective of this topic was to expand the knowledge on the role of engineering and the application of Science and Mathematics in the designing, testing, and building of machines, structures, and processes.

8.1 Engineering and Everyday Life.
The objective of this section was to create the links in the Children mind between their daily observations and STEAM areas. The children were asked to identify the things that they considered made everyday activities easier. These were identified as washing machines, cars and Vans, Phones, televisions, and radios. Several presentations revealed the science and engineering explanations for various implements which made washing, transportation, communications, and entertainment much easier.

8.2 Engineering Solutions- Group Work
The children were placed into groups. the main aim was to identify objects in the home and the surrounding community that they could identify as Technology and Engineering. They were able to identify engineering applications in the home, in the health centres and hospitals and in the wider world.

The home applications were seen as the air conditioning unit, the blender and the TV. For the hospital, the Xray machine, the ultrasound, and the thermometers were identified. In relation to transportation solutions the operations of the car and the airplane were discussed.

The exercise showed that the campers could understand the role of engineering in the world and in Saint Lucia. They were able to make the link between how the engineers used the science to design products and the technologist to build them.
The children were also able to link the use of science by engineers to the design of products, for example the air conditioning unit and the science of conduction and latent heat. They were also able to appreciate the importance of drawings in engineering both to conceptualize a solution and to help in the construction of the designed product.

8.3 Engineering Theory and Practise.

8.3.1 Presentations by Engineers in Various Fields.
As part of the objective to ensure that the campers were exposed to people in the field of Engineering in Saint Lucia, we invited three engineers to present aspects of their work to the students. The Engineers invited were Mr. Jevon Nathaniel – Generation Engineer at Saint Lucia electricity services ltd, Mr. Adane Edmund- Computer Engineer and Information System Manager at the Citizens Investment Program and Mr. Verne Emmanuel- Chemical Engineer and Director of the Bureau of Standards and President of the Association of Professional Engineers of Saint Lucia.

The engineering topics touched on were diverse and included:

- Electricity Generation, Transmission, and distribution.
- Sources of Energy transformed to create Electricity.
- Parts of the computer.
- Capabilities of the computer.
- Computer programming.
- Careers in Computing
- Sustainable Development.
- Standards in Science, Technology and Engineering.
- Careers in Engineering.
- The work of the Engineers Association.

The children were able to appreciate the wide area of knowledge that engineering encompasses and the links between engineering, technology, science, and mathematics.

9 Science and Technology - A Day at SALCC.
The campers spent a day at the Sir Arthur Lewis Community College. They were allowed to explore the entire gamut of STEAM disciplines related activities offered at the SALCC community college within the campus.

This visit provided the campers with some insight provided some insight into the STEAM associated areas that they can pursue once they complete the secondary school education level. It was also important as part of the preparation of these campers for attending that
institution and working in STEAM areas. A link was made between their preferred STEAM area and their selection of CSEC subjects and commitment to completing secondary school successfully.

9.1 Labs and Workshops at SALCC
The tour of the Labs and workshops exposed the campers to the tools, processes and procedures involved in science and engineering including safety measures. The workshops visited were as follows:

- HVAC lab
- The Garage.
- Electrical Lab
- Computer Lab
- Computer Aided Design (CAD) lab.
- Science Labs.
  - Physics.
  - Chemistry.
  - Biology.

Figure 6- Campers at the Electrical Installations Workshop of SALCC.
The day was very enriching and enlightening to the children and the “seeds of continuity” in getting familiar with all aspects of STEAM and the links to possible future careers have been planted.

10 Solar Farm Visit.
Following the site visit to the SALCC, the campers were all very animated on all aspect of STEAM and the role of STEAM in their everyday lives and future career decisions. This was followed with a visit to the LUCELEC Solar Farm located at La tourney in Vieux fort.

The solar farm presented an opportunity to explore science (Radiation, Materials Science, Soil science), engineering (Civil, Electrical, Mechanical, Chemical), and technology (Electrical Technology, communications technology and construction technology.

The various aspects of the solar farm were explained by Jevon Nathaniel, Generation Engineer at LUCELEC and Cornelius Edmund – Former Planning Manager at LUCELEC.

11 Week 2 – Strengthening our STEAM Concepts

11.1 Analysis of What was Learnt in First Week.
In the second week which started on Tuesday 2nd August, the emphasis was on reenforcing the concepts and the link to the various fields of STEAM presented and explored in the previous week. Week two focused on the knowledge and skills that were acquired in the first week and extending the life experienced in the community. A few field trips were planned for the week to achieve this. The first was a trip to Soufriere to visit the Sulphur Springs and the second was to the new Cabot Golf Resort Hotel under construction in the North of the Island. The aim of the sulphur springs trip was to highlight alternative sources of energy and the geological phenomenon associated with the volcano. On the other hand, and the Cabot trip was intended to demonstrate STEAM disciplines involved in the construction of the large resort.

12 Field Trip to Soufriere- Aug 3rd – Sulphur Springs.
The field trip to Soufriere proved very interesting to the children, on that site visit they learnt the science associated with the Sulphur springs and the Science, engineering and technology that allows the heat of the sulphur springs to be transformed into a generator of electrical energy.

The campers raised many questions about the viability and the science involved in the transformation of one form of energy into another.
13 Field Trip to Cabot Construction of Golf course and Resort.

The field trip to Cabot was very useful to the children as it shows many area of STEAM involved in the construction of a large resort with a golf course. The campers were able to learn much about the field of civil engineering and construction technology, Hydrological engineering and agricultural engineering useful to the development of the site into a world class golf resort.

The campers were able to question the onsite engineers and technicians about their work. It allowed the students to look at various careers and the requirements and to reflect on their possible role in future projects like these.
14 Review and closing.

The final day of the camp a review of the camp experience was conducted by the group of campers. The questions asked and answered, and the statements made by the students, demonstrated that they had learnt much about STEAM and associated subjects and how STEAM impacts their lives. They had clearly learnt many benefits of STEAM, and the possible STEAM careers. In addition the important role of STEAM in reducing poverty was reinforced. Mastering STEAM has the potential to improve their life chances.

The campers were asked to fill in a form, to describe their experiences at the camp, what were their dislikes and their likes and what aspect they would like to work on. This information provided the organisers with criterion to group the campers according to their preferred interest and guide activities in the coming year.

A small closing ceremony was held towards the end of the day. The parents were invited but many could not make it. The children were rewarded for various aspects of their achievement.
during the two-week camp. The organisers awarded good character and attitude. A certificate of participation was given to each child.

15 Lessons Learnt.
The nine (9) days of camp achieved some of the objectives set out, and it did set a platform to tackle the disadvantages faced by these children and open a window of opportunity. Many of the children who came enjoyed the camp tremendously.

The initial students were chosen by the teachers and principals of the schools from the community. However, many of the student chosen could not make it because they were not able to obtain permission from their parent or guardian. In most cases these children were the ones who needed the camp output the most. These children had to take up babysitting, housemaid and farming duties. We had anticipated this huddle before that camp and had decided to tackle it during our meeting with the parents and guardians, but late planning did not allow us the time to meet parents and guardians.

It was clear from the inception that most of the children were talented and possessed a strong desire to learn and experience new things. More than 75% were strong academically and socially and had good communication skills

Many deficiencies were observed including but not limited to the following:
- Lack of organizational capability especially among the boys.
- Difficulty with reading and writing.
- Difficulty in spelling.
- Slow in carrying out task.
- There were some children who were experiencing dyslexic.

Despite all the deficiencies, there is great hope for these children, based on their performance in the camp. We must strategize to deal with the deficiencies if we are to prepare the children for future careers.

In terms of administering the camp and the STEAM programs there were many lessons to be learnt.

- The parents were never bought into a meeting, to discuss the camp. This was not achieved because of the lack of time. We believe however, that in our community it was very important to constantly communicate and link with key stakeholders especially the parents. This meeting will have to take place before the start of the second camp.
- The emphasis that we placed on providing the children with proper meals was very important and well received by the children and parents. However, it was one of the
most expensive items and as such we need to budget for the food. There is also a need to control the distribution of the meals.

- The follow up and mentoring of the children during the months following the camp has not happened, this is mainly because of limited resources from a human and financial standpoint available to the Faces of Development organization. It is something that we should initiate before the next camp starts.
- There was no sports component included in the schedule. However, we had a fun afternoon for the children. We must endeavour to have sports science as part of STEAM and include more sports activities during the day.
- There were not enough camp assistants, this created the situation of larger group sizes. We will have to start recruiting the Assistants much earlier.

16 Next Steps
The first year of a three-year program was a leap of faith by the organizers and despite many shortcomings, we are now planning for the next two years. We believe that the first year of the camp has set up a very good foundation. There is now a need to ensure that the program succeeds. The following are some of the steps that will be taken:

- Send out the report of the first camp to all stakeholders, partners and sponsors.
- Mobilize the students and parents for the coming second year.
- Hold meetings with the following stakeholders:
  - Principals of the four schools.
  - Teachers of the students.
  - Parents
  - Sponsors
  - Other interested Groups and individuals.
- Send out request to a wider range of possible sponsors.
- Take steps to address the deficiencies discussed in the report. Put systems in place to start the rectification of the deficiencies encountered with the children.
- Plan and prepare for year 2 and 3 of camp.
- Update the strategy for the continued mentoring of the students.
17 Conclusions and Recommendations

The objective of the camp series was to provide protective spaces for the disadvantaged young people in the community and in so doing create new career paths. The first year was to introduce them to the benefits of STEAM and create the platform for their immersion into critical thinking, research, problem solving and driving up their creative juices. This report highlights the first year of the STEAM camp for children ages 9-14 of Dennery and the Mabouya Valley who were experiencing academic and socio-economic challenges.

The first year of the camp was successful and has shown that these children are a spark of hope, who can be successful in their career path and achieve a productive future. This can only be successfully harnessed if they are mentored, coached, and participate in incubation projects. The camp had some shortcomings, but overall, it fulfilled the expectations of the camp organizers.

After the two weeks the campers were able to associate many of the issues, they face in the community with STEAM areas content. They were able to suggest solutions, for example solar energy for the fishermen boats to replace gas and diesel engines since they had identified that the engines were a main source of pollution to their waters. There were many deficiencies during the camp. The deficiencies were wide, ranging from administration to delivery. One of these deficiencies was the lack of detection and addressing of learning disabilities among some of the children. These issues are solvable and some of the solutions identified are meeting with the stakeholders, creating mentoring and coaching sessions for the children.

They were slowly being changed from users of STEAM to developers of STEAM products. They now understood that the use and development of all those technology products that they use at home and in the community is achieved through the application of STEAM and by understanding what STEAM is about they are creating a path to successful careers.