# Students for Senegal
*Hands on Learning*

# The Lambaye Innovation Challenge

**Mid Year Report**

*January 21, 2021*

## Students for Senegal
Senegal, Africa



CONNECTING ACROSS CULTURES

EXPANDING ACCESS TO EDUCATION

# Executive Summary

PROJECT OVERVIEW:

The Lambaye Innovation Challenge (LIC) began in October, 2020 with the first of sixteen total workshops that will occur throughout the academic year. In workshop Series A, students participated in four introductory workshops, each with specific educational objectives, team and skill building activities, guest speakers, and partnerships with high school students from the United States. Two hundred students (ages 9-17) participate in the LIC program which takes place at the Lambaye Learning Center (LLC) facilities in Lambaye, Senegal. Students are broken into groups of ten students that attend LIC programs bi-monthly. Program participants are led by LLC director Assane Fall, and Technology Director Moussa Tamba.

| SERIES A WORKSHOP OVERVIEWS | | |
|---|---|---|
| Date | Workshop | Objectives |
| November 2- November 21 | 1 | Welcome & Introduction, Digital Skills |
| November 23- December 5 | 2 | Training & team building skills, Digital Skills |
| December 7- December 19 | 3 | How to drive change in a community, Computer algorithm & coding |
| December 21- January 2 | 4 | What is the role of government, Computer algorithm & coding |

KEY OUTCOMES:

- 200 students enrolled in Senegal
- 95% of students enrolled had never before used a computer
- Pre-test administered, > 85% response rate, results pending
- 40 U.S. peer mentors, over two dozen meetings held

# Programmatic Updates

WORKSHOP SERIES A: #1-4

*Introduction, Team Building, and Problem Solving:*

Students engaged in welcome activities to create a sense of community and purpose within the LIC. They participated in team building and group work centered lessons, focusing on developing skills that will allow them to work successfully with a team. Students got acquainted with one another, their on the ground mentors, and U.S. peer mentors. Students were introduced to the concept of change, community identifies, and the role of government in society.

| WORKSHOP 1 | |
|---|---|
| Overview | The purpose of this first workshop is to present the program in detail to the participants. This presentation will allow them to take ownership of the program but also to develop the first ideas of what fascinates them in everyday life. |
| Educational Objectives | 1. Understand the purpose and scope of LIC program<br>2. Begin building a community between participants and faculty<br>3. Discuss student interest and passions |
| Activities | A welcome ceremony introduced students to the Lambaye Innovation Challenge. Students heard from the Senegal-based program directors, as well as the US program directors. The Lambaye Village Chief welcomed students and provided words of encouragement to all program participants. Students were introduced to the Lambaye Learning Center and the technology and resources available to them throughout the program. Students were broken into groups to participate in team building activities, and introduced to basic computer and technology skills. Students were exposed to a variety of fields and began listing fields of interest to them that will be explored later in the program. |
| Guest Speakers | Amary Seck, Assane Fall, Sous-Préfet Lambaye, Maram Kairé, DST, IA Diourbel, Maire Lambaye, Moussa Tamba, Lauren Levinson, Calle Harwin, Katie Rotherham |
| Outcomes | ● The participants understand the program and are committed to giving the best of themselves<br>● Students were introduced to all program leaders<br>● Initial teams were formed<br>● Interests were identified to be used later in the program<br>● Students learned beginning computer skills and were introduced to a variety of technology |

| WORKSHOP 2 | |
|---|---|
| Overview | In this workshop students will develop skills and learn techniques necessary to carry out group work. The emphasis will be on individualism in the collective project. Each team member should work not individually but with everyone else to achieve a common goal. To do this, they must share common values and a vision of the work to be done. |
| Educational Objectives | 1. Learn the fundamentals of teamwork<br>2. Develop the spirit of knowledge sharing and the sense of the collective<br>3. Apply newly developed team-building skills within the context of small scale real-world problems |
| Activities | LIC students developed teamwork skills with a variety of activities aimed towards building confidence in a group setting. Students met within their assigned groups to partake in these activities with the peers they will be working with throughout the entirety of the program. Students watched videos about the importance of teamwork and leadership, and using their voices to create meaningful change. Team building games allowed the students to get to know one another in a more meaningful way that will allow them to effectively collaborate as the program continues. Students were also given decision making scenarios in which they were asked to role play the process of making a decision, and the process of thinking critically when faced with difficult decisions. |
| Guest Speakers | Assane Fall, Moussa Tamba |
| U.S. Partnership | December Partnership: U.S. high school students and LIC students met via video conferencing platform Zoom for the first time. Over the course of ten sessions, U.S. and LIC students became acquainted. Students introduced themselves one by one, saying their name, age, and what they hope to be when they grow up. U.S. students shared a video from Students for Senegal president Amary Seck, welcoming all students to the program. Students had a discussion about the meaning and importance of *community* and engaged in an art activity in which all students drew their community as well as the people within their communities. Students shared out what they had drawn, comparing and contrasting with their peers. LIC students shared a video they had prepared, and the meeting concluded with a bilingual game of *Simon Says*. |
| Outcomes | ● Students understand the meaning and importance of teamwork<br>● Students gain a network of peers with whom they will work locally<br>● Students recognize the importance of leadership within a group<br>● Students meet with their U.S. mentors for the first time and begin getting to know one another |

| WORKSHOP 3 | |
|---|---|
| Overview | The purpose of this workshop is to introduce students to the basics and process of change management in a community. This presentation is followed by a sharing of experiences that will allow them to discover models of success in Senegal and around the world, and will serve as a source of inspiration for the participants and for their projects. |
| Educational Objectives | 1. Determine the role of youth in the community<br>2. Understanding individual's impact on large systems<br>3. Introduce students to models of change in their community and in the world |
| Activities | Students participated in activities and discussions in which they gained a deeper understanding of their communities as a whole. Students spoke with community leaders to discuss the role they play within their own communities, and compared their own communities with others worldwide. Students had discussions about the part they, as students and community members, play in their communities, and discussed how change can be enacted. Guest speaker Abdou Toure visited the Learning Center via video conferencing platform Zoom to engage the students in these conversations and talk about his own community leading experiences. Separately, students began brainstorming problems within their community and started thinking about what they may want their project to be about. |
| Guest Speakers | Abdou Toure, Moussa Tamba, Assane Fall |
| U.S. Partnership | December Partnerships continued from Workshop 2. |
| Outcomes | ● Students understand their role in the community and are ready to play a part in it<br>● The individual's impact on their community is defined and understood by participants<br>● Students discovered and were inspired by models of change |

| WORKSHOP 4 | |
|---|---|
| Overview | In this workshop, students will partake in activities with a goal of understanding the role of government in society. Students will have presentations about the fundamental role of government in a democratic society and the role of citizens. Students will have the opportunity to engage in the hands-on activity of role-playing governmental issues and dramatizing the work of government leaders. |
| Educational Objectives | 1. Describe the role of government leaders<br>2. Analyze the role of an individual active citizen in a democratic society<br>3. Recognize differences in governments within one country<br>4. Compare and contrast a variety of government structures |
| Activities | Students in this workshop were taught about the role of government leaders in their own communities. They discussed how citizens can participate in government in big and small ways, and the many impact government leaders have on their communities. Students learned about the important decisions that government leaders face, how they make decisions that will impact many people, and how governments influence their daily lives. Students thought critically about their own role in societies and how they engage in their communities and the proceedings of government leaders. They discussed the role of citizens within a democratic society and how important it is to participate in society structures. After learning about their own government structures, students learned about the similarities and differences it has to other countries, including the United States. After these presentations and discussions, students were broken into teams to act out the functions of governments in communities both locally and abroad. Students took on the role of active citizens and government leaders, engaging in role play dramatizations about scenarios the government may face. Students also looked through their brainstormed lists of problems within their community from the previous workshop and began narrowing down their project choice. *See below for project choices.* |
| Guest Speakers | Assane Fall, Moussa Tamba |
| Outcomes | ● Students understand the role of government and the impact it has on the state and individual citizens<br>● Students learned about their role as active citizens in society<br>● Students learned and understood the differences and commonalities between the Senegalese and U.S. governments |

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## Project Choices

The 20 groups have already worked on the choice of projects based on the problems detected in Lambaye. These projects touch several fields (environment, health, education, energy, citizenship, water…) and are detailed in the table below.

| Title | Object | Field | Group |
|---|---|---|---|
| Solar street lighting | A public lighting system based on the use of solar energy with recovery and recycling | Energy | 1 |
| Solar aquaponics | Automated hydroponics and fish farming system | Agriculture / Energy | 2 |
| Solar drilling | A solar-powered borehole to compensate for water shortages caused by frequent power cuts | Water / Energy | 3 |
| Wind-powered electricity | An electric generator system with the use of wind | Energy | 4 |
| Declare my child at birth | A mobile application that facilitates the declaration of children at birth | Early childhood | 5 |
| Remote medical diagnosis | A system that connects doctors and the populations of Lambaye to facilitate access to medical care | Health | 6 |
| Biodigesteur | System for transforming organic waste into biogas | Energy | 7 |
| Automatic seed sowing | A solar robot that automatically sows seeds | Agriculture | 8 |
| Solar oven | Sun-based cooking system | Energy | 9 |
| Air Lambaye | A management application for the Lambaye garage (movement of vehicles, number of passengers per day, etc.) | Transport | 10 |
| Solar dryer | To preserve food by dehydration during exposure to the sun, while ensuring good hygienic conditions, in particular by avoiding contact with dust or insects | Energy | 11 |
| "Same gokh" | An application that educates populations on civic engagement | Citizenship | 12 |

| Anti cattle theft system | A device that uses ultrasound to detect presence, movement and distance. | Breeding | 13 |
|---|---|---|---|
| Phytoépuration | Wastewater treatment system using aquatic plants | Water / Environment | 14 |
| Ecological garden | Realization of a garden model with recovered objects and recycling | Environment | 15 |
| Form working groups | An application that allows you to form intelligent work groups. Cross data and propose complementary work groups between the students. | Education | 16 |
| Crowdfunding | A crowdfunding system for the purchase of health equipment | Health | 17 |
| Environmental Protection | Inventory and publication of fauna and flora on a web platform | environment | 18 |
| Rainwater collection system | Automated system used to collect and treat rainwater | Water | 19 |
| Hydroponics and PVC | Above-ground market gardening system which saves a lot of water | Agriculture | 20 |

## **Obstacles & Overcomings**

TECHNOLOGY SKILL LEVEL AMONG STUDENTS

Students arrive at the Lambaye Learning Center to participate in the Lambaye Innovation Challenge with varied technology use and skill levels, as well as an array of ages. Students may be as young as nine years old going up to eighteen years old. Some students have had training and experience using technology from a young age, and some students are just beginning to use computers for the first time. From this variation in age and technology level, it has become necessary for the implementers of the program to get creative in the delivery of their instruction by differentiating the content of the lessons to meet the needs of all of the students. Lessons and content are adapted to have varying levels, so those skilled with technology may be further challenged, while those with less experience gain valuable basic technology skills.

## TRAVEL & ATTENDANCE

Students in the Lambaye Innovation Challenge come from villages surrounding the Learning Center in Lambaye. We have seen circumstances arise that make it difficult for students to travel to the village to attend their courses. As a result, we are not always able to easily predict how many students will be in attendance, and to have a predictable schedule as we had expected. To accommodate these students, we have made scheduling more flexible than originally intended, to allow students with travel difficulties to attend the same program, but on a different day. This allows all students to thoroughly participate in all programs and courses even when travel becomes difficult.

## STAFFING RESOURCES

The Lambaye Innovation Challenge has over 200 Senegalese students with a variety of learning needs. Since there are only two teachers at the LLC to administer the program, schedule, plan, and interact with students, for the next quarter we will be actively looking to partner with library training programs and universities to have student interns assist with the programming directly related to the LIC. We believe these interns will be a valuable asset to the students in the program, the teachers on the ground, and the Lambaye Innovation Challenge as a whole.

## COVID-19

All students are required to wear masks while at the Learning Center. Resources were allocated so personal protective equipment can be provided to all students that may not have it. The number of courses and times in which classes are held was increased to allow for smaller groups of students to be present at the center at a time. Many guest speakers and some supplemental programs take place using video conferencing to limit the number of people at the Learning Center at a time. We will continue to take these safety precautions as long as necessary.

# PLANNED ACTIVITIES: NEXT STEPS

<table>
<tr>
<td colspan="3" align="center"><strong>SERIES B WORKSHOP OVERVIEWS</strong></td>
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<tr>
<td colspan="3" align="center"><em>Problem Identification, Research, Research Methods, and Strategization:</em><br><br><em>Students in the village will identify a problem that they are passionate about within their community and will learn the research skills needed to identify and solve it.</em></td>
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<tr>
<td align="center">Workshop</td>
<td align="center">Objectives</td>
<td align="center">Outcomes</td>
</tr>
<tr>
<td>5</td>
<td>Problem Identification Part 1: Introduction to research methods</td>
<td rowspan="2"><em>Teams will develop unique, focused problem statements based on their research and passions.</em><br><br>1. Articulate specific examples of problems and their root causes<br>2. Engage in preliminary field research to identify what community members see as problems<br>3. Analyze objective measures to find other potential problems</td>
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<td>6</td>
<td>Problem Identification Part 2: Application of research methods</td>
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<tr>
<td>7</td>
<td>Search For Solutions Part 1: Every problem has a solution</td>
<td rowspan="2"><em>Teams will submit a written plan with documents, drawings, and budgets for their proposed solutions. Teams may apply for supplemental funds as needed at this time.</em><br><br>1. Identify the relationship between problems and solution<br>2. Describe what makes a reliable source<br>3. Propose solutions to personal/local problems</td>
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<tr>
<td>8</td>
<td>Search For Solutions Part 2: My problem has a solution</td>
</tr>
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## SERIES C WORKSHOP OVERVIEWS

*Engineering and Implementing a Solution:*

*Students will create a solution to their topic of choice. They will decide the most effective method to implement their solution in the village, with the guidance of their US mentors. Students will have the opportunity to reflect on their solution and revise, if necessary.*

| Workshop | Objectives | Outcomes |
|---|---|---|
| 9 | Thinking Like a Designer: "Sketching" a Plan | *Teams will use models to create the first draft of their solution*<br><br>1. Gain exposure to art-based scientific mediums (blueprints, design plans, etc)<br>2. Apply mediums to team problem<br>3. Explain the importance of thorough planning |
| 10 | Thinking Like an Engineer | *Teams will begin construction or implementation of their proposed solution*<br><br>1. Describe the concept of logical design<br>2. Propose how something can be created<br>3. List what materials are needed and why |
| 11 | Thinking Like a (Disciplinarian) | *Teams will continue working on their solution and begin testing to see it's effects*<br>1. Research a career that would be helpful in solving the team's problem<br>2. Understand the role of an expert in that field<br>3. Take on the role of field expert and modify their project accordingly |
| 12 | How a Scientist Deals with Failure | *Teams continue work on solutions, addressing challenges as they arise*<br><br>1. Explain how failure can lead to success<br>2. Describe steps that can be taken after a failure |

## SERIES D WORKSHOP OVERVIEWS

*Redesign, Analysis, Re-implementation & Presentation:*

*The final series of workshops will focus on reflecting and measuring the work the students have accomplished to learn how to assess and reassess a process for success. Emphasis will also be on communicating their ideas to others to prepare them for the Capstone Presentation*

| Workshop | Objectives | Outcomes |
|---|---|---|
| 13 | Testing a Hypothesis | *Teams will begin revising their solutions and preparing to reimplement*<br><br>1. Define what a hypothesis is<br>2. Articulate what they hypothesis their solution is testing |
| 14 | Measuring Outcomes | *Teams will analyze data collected about their project for success*<br><br>1. Describe what makes a good measure<br>2. Describe basic statistical methods (mean, median, mode)<br>3. Practice making graphs and using spreadsheets |
| 15 | Final Project Preparations | *Dedicated time for teams to prepare final presentation* |
| 16 | Communicating Ideas Effectively | *Continue preparing final presentation and practice delivering it*<br>1. Describe and hone the main idea of their project<br>2. List effective communication techniques<br>3. Rehearse final presentations |

## Photo Documentation



*Official launch of the Lambaye Innovation Challenge with U.S. leaders attending via Zoom*



*Official launch of the Lambaye Innovation Challenge*



*The first group of Senegalese and U.S. students meet via Zoom for the first time.*
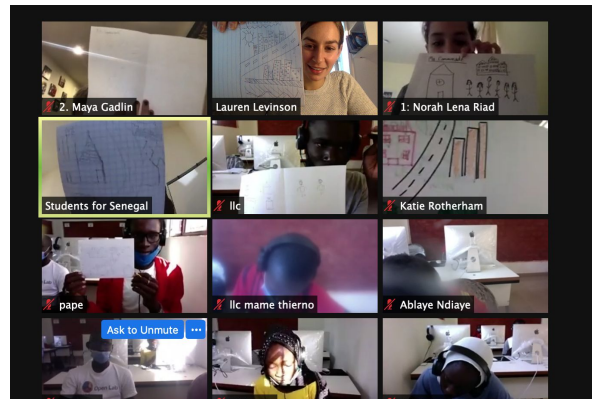


*LIC and U.S. students share drawings of their communities*

*LIC students engage in an "ice breaker" activity*
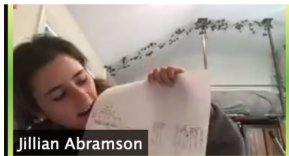


*Group photo of the first workshop of the Challenge*
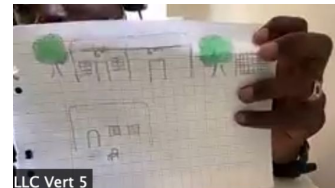


*Students use computers to engage in online activities*



*Students speak with guest speaker Abdou Touré about change in communities*



*LIC and U.S. students share their drawings of their communities*



*LIC and U.S. students share their drawings of their communities and community members*