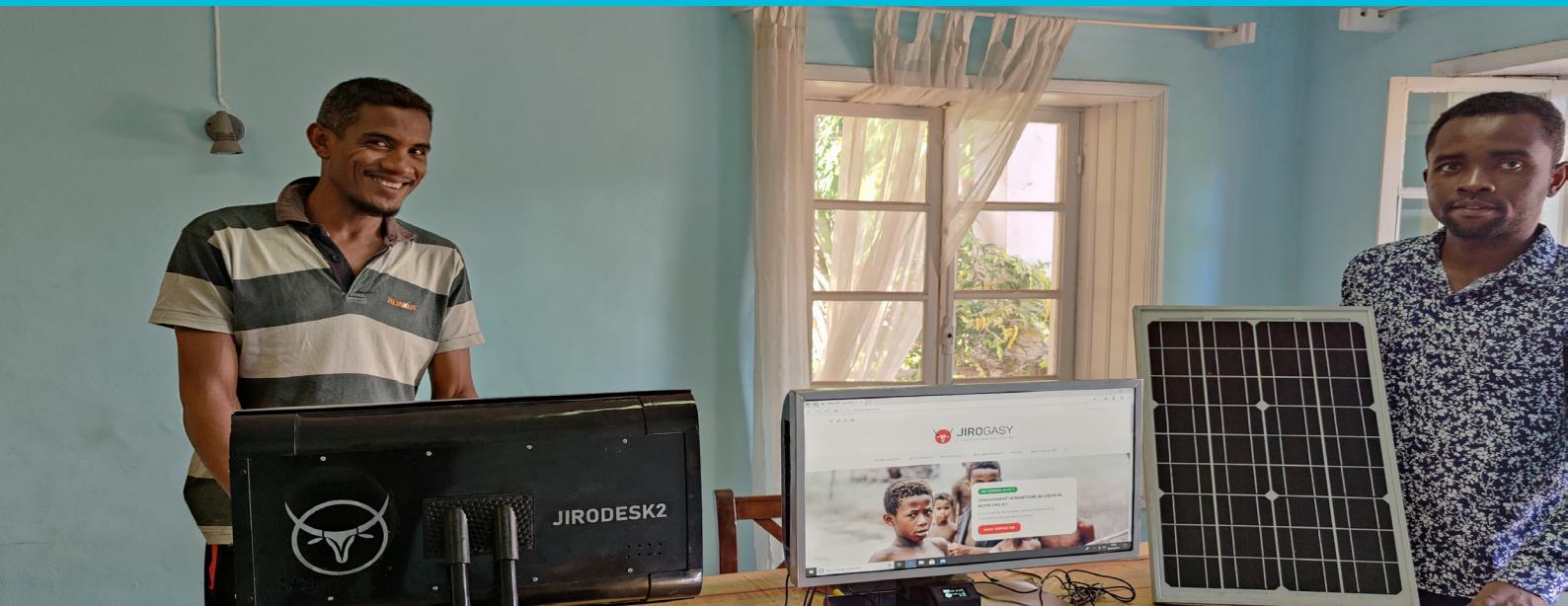


EFFICIENCY FOR ACCESS RESEARCH AND DEVELOPMENT FUND: INNOVATOR SERIES

IMPROVING DIGITAL EDUCATION THROUGHOUT MADAGASCAR



As 600 million people still lack access to electricity in Sub-Saharan Africa, the electrification rate for schools, public facilities and small businesses remains below 5% in rural areas. As a result, students from rural areas in Sub-Saharan Africa do not have the opportunity to learn about computing in their education. In addition, technologies such as computers used by 80% of workers elsewhere in the world, are not a viable solution for institutions in rural areas.

Digital education is an undeveloped area in Sub-Saharan Africa. Learning how to use computers at schools can help increase access to news, communication, and boost productivity. Digital education can also help students once they have finished school; either going to university, or obtaining a job, as digital technologies are often used in sectors such as agriculture.

At present, there are some off-grid-appropriate computers available, but they are typically a combination of several devices. Individual or small business owners can plug a desktop computer or a laptop into existing 200W solar home systems (SHS), or users can go to larger-scale cybercafés, which use diesel generators to power several computers. However, power supply is not always reliable or affordable.

Customers may also have to purchase multiple devices in order to make their computers work, including extension leads, monitors and adaptors, which can also be costly. Additionally, the installation and maintenance of these computers for rural users is not always possible or affordable and can generate electrical waste.

DID YOU KNOW?

600 million people still lack access to electricity in Sub-Saharan Africa.

JIROGASY'S JIRODESK 2: A PLUG-AND-PLAY COMPUTER

Founded in 2017, Jirogasy is a company based in Madagascar that specialises in producing SHS and other solar powered products, such as the Jirodesk Version 1 (V1), a solar-powered computer. Jirogasy developed, manufactured and deployed 100 units of Jirodesk V1 across six schools in 2019.

With support from the Efficiency for Access Research and Development Fund, Jirogasy created Jirodesk2. Jirodesk2 combines a SHS, a battery and battery management system, a motherboard integrated behind a 21-inch touchscreen and a Pay-As-You-Go (PAYGo) module. The computer is a ‘plug-and-play’ device that is easy to install, and combines access to light, charging station and a digital computer for the price of a low-cost computer or a large SHS. Moreover, as the computer runs on solar power, it can help avoid the CO2 emissions that could be emitted by a diesel generator.

JIROGASY:

“The Efficiency for Access Research and Development Fund has been essential in the scaling-up of our digital workshops and our electronic lab. It has enabled us to enhance the product development and testing of Jirodesk2, which we have been testing in six schools for the past six months.”

– Yann Kasay, CEO, Jirogasy

JIRODESK2: HOW WAS IT DEVELOPED?

Jirogasy created the “Jirodesk2”, an all-in-one device that provides access to light, a charging station and a Windows 10 desktop computer. After plugging a solar panel into the Jirodesk, the user can start using all the features of the solar powered computer within 10 minutes.

The first feature developed in the project was a design for the solar-powered computer. This design integrates an 80W solar home system, a Windows 10 computer and a 21-inch screen. It was essential in facilitating the use of the Jirodesk2 by making it ready to be installed. This simplifies the setup of the computer, especially if the user has never used a computer or a solar home system. The user will only have to plug the integrated device in, and it will turn on. This was a vital first step in Jirogasy’s project, as it helps to ensure that the appliance is easy to use and accessible for consumers.

Jirogasy also created a smart controller, equipped with a remote monitoring module. This system alerts Jirogasy about any problems that a customer may encounter with the device, such as slow speeds, intermittent power and any problems with the functionality of the computer itself. By developing the remote maintenance system, Jirogasy can discover and resolve any issues, and remotely help the user by sending instructions.



The remote monitoring feature can also lock and unlock the computer remotely. This is important for security reasons, but also enables a more affordable PAYGo option, as Jirogasy can enable the computer when a customer makes a payment.

Jirogasy developed Jirodesk 2 so that it can integrate a large range of batteries. The company designed and tested multiple types of battery management systems that can be integrated into the solar controller. The controller can use lithium-ion, lithium iron phosphate (LiFePo) or external batteries, such as gel or lead-acid batteries. This creates an entirely customisable product, suitable for a wide range of clients, such as last-mile distributors. It also helps to mitigate any e-waste as additional parts do not have to be used or retrofitted.

WHAT DID THE PROJECT ACHIEVE?

Increased affordability of solar-powered computers

Jirogasy successfully managed to reduce the average retail price of solar-powered computers compared to current available solutions on the market. It produced 14 computers for two schools, enabling access for 1000 high school students. The integrated device comprises a Windows 10 computer with a 21-inch screen, 80W solar home system that can charge phones and up to four light bulbs. At the time of project completion, it is the only computer of its kind currently available on the market. Since there are no comparable appliances available, Jirogasy compared its cost with a Windows 10 PC, an 80W SHS, a TV and accessories such as keyboard and mouse. The Jirodesk2 (when looking at charging capabilities etc) is worth USD 645, in comparison to a minimum of USD 1100 for the abovementioned PC.

When comparing the Jirodesk 2 with the original Jirodesk 1, the battery capacity increased from 288Wh to 456Wh. The Jirodesk2 can last longer and does not have to be recharged as often as the Jirodesk V1. Furthermore, the cost per watt hour decreased from USD 1.80/Wh to USD 1.60/Wh, overall, greatly increasing the affordability of the Jirodesk.

Enabled the growth of Jirogasy

The project helped Jirogasy to expand as a business and attract more funding. The project created six new jobs, four of which went to women. As local assembly and development is core to Jirogasy’s approach, all of these went to Malagasy people, thus helping strengthen the domestic community and economy. As a result of the exposure from the Efficiency for Access Research and Development Fund, Jirogasy also received an additional, external grant from Haut de France. The company used this funding to install four new computer rooms and distributing SHS in four villages in Madagascar. This will give digital access to 2000 additional students each year for the next four years.

Field testing and training of teachers

Jirogasy partnered with Accesmad, an in-country NGO working to improve children's education in Madagascar through a network of schools with educational content and training. Accesmad visited the schools that were equipped with the Jirodesk2 to train teachers to use the computers and small servers. This partnership helped almost 7000 Malagasy students gain access to the Jirodesk2 and online educational programmes. As a result, Accesmad and Jirogasy are expanding their portfolio of training materials for and educational content for students to cover a wider variety of subjects, in both Malagasy and French.

WHAT DID WE LEARN?

Gathering customers' feedback and respecting international standards for electronic production is key to creating a product that meets users' expectations.

The Efficiency for Access Research and Development Fund encouraged Jirogasy to use its processes and key performance indicators to monitor the development of the project. One aspect of this was an increase in field testing and user surveys to gather and implement customer feedback. This enabled Jirogasy to integrate feedback while developing the Jirodesk2, ensuring the computer was the best suited to the end-users' needs.

Furthermore, Jirogasy built its products according to Lighting Global's programme requirements, which could enable it to become a certified product provider in the future, increasing the company's exposure and expertise. Jirogasy found that quality testing using international standards makes the product development more organised, as there are clear regulations to adhere to and it encourages an improved manufacturing process.

Local production and assembly are key to successful manufacturing and distribution in Sub-Saharan Africa.

Given the ongoing COVID-19 pandemic, and hard to reach last-mile distributors and customers, producing a product in Madagascar remains a challenge. Jirogasy found that fostering local employment, manufacturing, and assembly helped mitigate some of the challenges that the company had originally faced.

For example, local production helped to reduce the logistical issues involved in shipping and transport. Jirogasy also plans to open a second production site in continental Africa to help mitigate regional issues, such as a lack of materials, as they can be sourced elsewhere.

Remote, direct communication with consumers is vital to ensure the Jirodesk2 is successful

Previously, Jirogasy had encountered difficulties in developing an affordable data protocol as existing, appropriate software was expensive. Thanks to this project, it was able to develop an affordable and efficient data protocol. As a result, this data has helped to shape product development and Jirogasy has more clear information about how consumers use the Jirodesk2.

ENHANCING THE JIRODESK2 TO REACH MORE STUDENTS

Following the project, Jirogasy aims to scale-up its operations of Jirodesk2, ready for mass-production and the increased access to digital technology in rural areas. This has been made possible by the additional grant given by Hauts de France.

Jirogasy is also working to improve the Jirodesk2. It intends to submit its Jirodesk2 to Verasol, which will help position the company as an industry leader in solar-powered, off-grid computers. It is developing the PAYGo functionality of the computer and integrating a 0G protocol. This means that remote monitoring can still occur, even without internet access, to give Jirogasy a complete overview of Jirodesk2's performance and usage.

GET IN TOUCH:

EforAgrants@est.org.uk

