

# The Bolivian Teenager Turning E-Waste into Robots

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*In the landfill near his home, one Bolivian boy collected e-waste to build a robot inspired by the Pixar character Wall-E [Valentino Bellini/Al Jazeera]*

**In the rural town of Patacamaya, Esteban Quispe makes robots from scrap to give his family a better future.**

by [Eileen Quinn](#)

**Patacamaya, Bolivia** - Seventeen-year-old Esteban Quispe is busy at his computer. Seated in the room his parents have turned into a workshop, Quispe is surrounded by different materials - electrical wires, metal sheets, and bulbs of different sizes and colours - all of which he has collected from a local rubbish dump to make into robots.

Quispe's creations are made from electronic waste and the teenager is entirely self-taught.

He proudly shows off a toy car with a circuit of bulbs that light from left to right like the KITT car from the 1980s American TV series Knight Rider; an LED cube which displays 3D images; and his most complex and beloved creation - a square-shaped robot that is a replica of, and is named after, the Pixar character Wall-E.



*Quispe stands in the courtyard of his home with his mother Teresa and his father Martin [Valentino Bellini/Al Jazeera]*

Quispe's hometown, Patacamaya, with a population of about 12,000, lies about 100km southeast of the Bolivian capital La Paz.

Bolivia [remains](#) the poorest country in South America, with low levels of scientific and technological innovation. In Patacamaya, where many residents live in poverty and don't have access to secondary education, Quispe's talent for making electronic devices from e-waste has made him something of a local celebrity.

The teenager's knack for building electronic devices caught the attention of local media last year after he won first prize in a high school robotics competition with his robot Wall-E.

He first came up with the idea of making it in 2008 after watching the Pixar film. Quispe began collecting materials to piece together the robot. After several attempts, he completed the final version in 2014.

"I immediately liked the character because of its intelligence and ecological conscience," Quispe explains.

"I am a bit like Wall-E," says the teenager, "as I wish Bolivia was a less polluted country."

Quispe describes one of the reasons why he focused on electronic waste. "I know electronic waste should be discarded separately from other kinds of waste because it's more dangerous, but here in Patacamaya people still don't understand the importance of differentiating," he says.



*A childhood photograph of Quispe selling some his first creations made from copper wires [Valentino Bellini/Al Jazeera]*

Quispe became interested in mechanics when he was a child - he used to watch his father, a former construction worker, make wooden toy cars in his spare time. Together, when Quispe was 10, they built a toy vehicle with a set of lights. Quispe began practising on his own, making small objects from copper wires, moving on to increasingly complex designs, and soon outdoing his father's models.

When he was 11, he started selling his first creations on the street. He would set them up on a table and sit on the pavement with his younger brother Hernan and other children from the neighbourhood and wait for people to stop by.

Thanks to the money he made from selling his creations, Quispe's parents were able to buy schoolbooks for their sons. Now, with his father unable to work due to chronic back pain, Quispe hopes to utilise his skills to support his parents and his brother.

"I can now make more sophisticated robots, like Wall-E, and I had a proposal from a person here in Patacamaya interested in buying it. I would be happy to use the money to help my parents and Hernan, especially after all they have done for me," he says as he walks out of his workshop into the garden.



*Quispe stands in his family's courtyard with his robot Wall-E which he can control directly from his mobile phone [Valentino Bellini/Al Jazeera]*

Showing off photographs from her son's recent high school graduation, his mother Teresa Churata recounts with a timid smile that her son "has always been the first of his class".

Churata herself began working at a young age to support her family. She never had the time to study. As a devout Catholic, she prays every night that her sons will have the chance to study at a foreign university.

Every week, Quispe visits the rubbish dump near his family's house to collect materials for his robots.

"It's not ideal, but the dump is the only place where I can find materials without having to pay for them. Using new materials would be better but I cannot afford them," he says.

"Also, I like the idea of recycling electronics that people throw away. I don't usually see many people there; I'm the only one making robots from waste here. Hernan always comes with me though."

Quispe's younger brother Hernan is now 14-years-old and eager to learn as much as he can from his older brother and always goes along on the landfill excursions.



*The Quispe brothers talk and trawl through the rubbish dump looking for materials to bring home [Valentino Bellini/Al Jazeera]*

As the brothers chase each other and play amid the mountain of burning waste thick with smoke at the dump, Quispe tells that he hadn't realised that collecting e-waste could be hazardous until the reporters who interviewing him brought it up.

"[They] told me that collecting e-waste directly from the dump is dangerous for my health because of contamination and air pollution," he says.

"I did not know these things before. I now try to be more careful, but there is not much I can do to reduce risks. Not coming any more would be the answer but I do not want to do that."

Walking through the rubbish dump, filled with everything from discarded electronics to animal carcasses, Quispe demonstrates his meticulous material selection process. He carefully checks the e-waste and quickly determines whether or not something is of use.

After about 20 minutes, he decides that there's nothing interesting to take home with him that day and heads back.



*Quispe walks from his home to the nearby waste dump with his robot Wall-E [Valentino Bellini/Al Jazeera]*

Quispe shows how his Wall-E responds to commands sent directly from his mobile phone through software he created.

He plans to make a more sophisticated Wall-E that can recognise its owner's voice, respond to commands and complete simple activities, such as moving around in different directions, he says. He wants to sell it for about 11,000 Bolivianos (\$1,600).

Quispe is preparing to begin a five-year electronmechanics course at the Universidad Catolica de La Paz where he has been offered a scholarship, and although he is excited to live in "a real city with better services than Patacamaya", he has set his mind to go further.

"I love my country, but I think I would achieve more in a richer place," says Quispe, explaining that he plans to earn a postgraduate degree in Europe.

"People in Bolivia are still not aware of the importance of recycling, or of environmental issues in general. Studying in a country with more sophisticated technological instruments would allow me to invent more and to invent better."



*Quispe and Wall-E. Since participating in a high school robotics competition last year he has become something of a local celebrity in Patacamaya [Valentino Bellini/Al Jazeera]*

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Nevertheless, Quispe believes in his hometown's potential to grow and wants one day to become an active player in its social and economic development.

"Patacamaya is already bigger than two years ago. So many more houses are being built and I am sure it will be a different place in five years' time. I would be happy to be able to run my own business here after my studies, and if I will have to travel a lot for my job, I will manage it from abroad," he says.

Although he is overwhelmed by the media attention, he believes sharing his story can only help.

"I have been working with e-waste for several years, but I only got an offer for a scholarship after reporters started writing about me. I'm not necessarily interested in being famous, but maybe if people talk about what I do, other universities in Western countries will offer me scholarships too," he says.

"I am ready to start my course in La Paz. Now I can only hope to make the most of this opportunity and to build a better future for me and my family."