

Diabetes and artificial intelligence: from citizens to research

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A collaboration between a diabetic patient and the FBK eHealth research group stemmed from the "La bottega della Scienza" project, which gathers scientific research proposals advanced by citizens and involves schools.

The direct involvement of **citizens** in scientific research is now an increasingly widespread reality. There are countless **citizen science** projects around the world in which non-expert enthusiasts “help” researchers conduct research, for example by **collecting data** or making available the **computing power** of their computers.

However, there are also other forms of **participatory research** in which citizens have the opportunity to advance their own ideas and scientific research projects: this category includes the so-called “science shops”, that are very widespread above all in northern Europe. For about two years, **Fondazione Bruno Kessler** has also had its science shop, “**La bottega della Scienza**”, which, in addition to citizens and researchers, involves schools as well: it is actually the students of some high schools in the area who work, under the supervision of experienced researchers, on **research projects** based on residents’ proposals.

One of the proposals received in the 2019/2020 edition was advanced by **Cecilia Cainelli**, a diabetic patient, who drawing on her personal and health experience posed a very direct challenge: to exploit the potential of **artificial intelligence** in creating an effective control system of the various **variables** that can affect **blood glucose** levels.

The proposal, selected among the most interesting by the scientific committee of “La bottega della Scienza”, immediately attracted the attention of the **FBK eHealth unit**, which had already started some **research lines** relating to the development of apps and similar tools for diabetic patients.

Thus, while Cainelli’s original proposal became a small research project conducted by students of the **Buonarroti High School** of Trento – who worked on the creation of a **software program**

that would act as a “base” for a device capable of monitoring insulin intake – it also **prompted FBK researchers**, who took the opportunity to improve their research on diabetes thanks to the indications of a patient with a **deep understanding** (including from a strictly scientific point of view) of her condition.

“It was **particularly stimulating** to take the cue advanced by a diabetic patient like Cecilia, who showed, right from the start, that she is well aware of the scientific management that can be done in the evolution of her condition”, Andrea Nicolini, project manager of TrentinoSalute4.0 and FBK main contact for this project, explained. “Trying to meet Cecilia’s needs on the one hand and those of the school on the other hand, in a growth path within the project, and to direct a research activity that would allow to achieve a useful result for everyone, was a really interesting challenge that allowed us to put on it a lot of the passion that already characterizes the activities we carry out every day».

“I have always believed a lot in research and science, and for me Fondazione Bruno Kessler has always been a point of reference”, Cecilia Cainelli stressed. «I thought I could **launch a challenge**, drawing attention to a particular need: my condition is not yet fully known, and there are **many variables** that can influence it. One of the things that research can do is find out what these variables are. This challenge was taken up by the FBK researchers».

Now the hope is that this experience will become **the first of a long series**, and push the growth of citizen science, also in medicine and health. “Collecting the input of citizens is not only a challenge today, but it will reasonably be the greatest challenge in the coming years for research,” Nicolini recalled.

The project with the Buonarroti High School will end in early 2021. After that, the research group should continue the collaboration with Cecilia Cainelli and facilitate similar citizen science initiatives in the future, involving other patients and citizens, as well as school students.

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