

The youth do science

MARIA CALSAMIGLIA
MIQUEL PERDIGUER

The Youth and Science programme by the Caixa Catalunya savings bank aims at exposing youngsters with talent to scientific activity, raising their interest in this field and giving them support during their education. The programme started in 2008 with the E²C³ (Science Summer Stage of Caixa Catalunya), in which 53 sixteen-year old took part. The key points of this stage were adapting activities to the targets, participation of an enthusiastic and communicating scientific staff and a group of selected youngsters with outstanding scientific attitudes and abilities.

E²C³ surpassed initial expectations; enthusiasm, curiosity, capacity and will to work of participants and scientists fed back each other, thus allowing the youngsters to attain scientific progress and have a very enriching environment. There is talent, and lots of it. Hence there is a long way to go in order to help talent be detected, emerge and develop.

At the Social Work department of Caixa Catalunya a new R&D&I area has been taken up recently, basically addressed at enhancing the relation between university and business (e.g. with the support of the Barcelona Science Park), giving support to new post-graduate initiatives for international excellence (e.g. the Barcelona Graduate School of Economics) and raising talented people. It is from the latter perspective that the Youth and Science programme is to be regarded.

The main goal of the Youth and Science programme is to expose talented youngsters to scientific activity, raise their interest in this field and give them support during their education, going clearly for future research potentials. All these actions try to contribute to the increasing demand by the industry of highly skilled workforce and revert the downward trend of students registered in scientific careers.

The main goal of the Youth and Science programme is to expose talented youngsters to scientific activity, raise their interest in this field and give them support during their education.

The Youth and Science programme started earlier this year with the E²C³ (Science Summer Stage of Caixa Catalunya) in which 53 youngsters having completed the 10th grade took part. The stage took place in Les Planes de Son in the Catalan Pyrenees from 30 June to 12 July. Every participant did one of the five projects offered, together with scientists active in the different fields of work and with mates of their same age having similar scientific interests and abilities.

The key points of the stage were:

- ▶ Suitability of activities as to targets;
- ▶ Suitability of scientists;
- ▶ The group of recruited participants.

1. Suitability of activities as to targets

Science is often taught as a massive and complex block of contents in secondary school (and also university) so it is difficult to pose questions. Pupils have a hard time anyway in understanding concepts and mechanisms to be able to do the tasks they are asked to.

Participants learned to search information, formulate hypotheses, lay out experiments, interpret results, discuss, listen, have a critical attitude and consider all possible explanations.

Doing science, i.e. research, is a way of looking at and perceiving nature. It is the application of the scientific paradigm in analysing specific situations. It is this critical point of curiosity and creativity, of stringency and ongoing discussion that makes it unique and appealing. And pupils are unaware of this.

For the stage to forge and feed scientific vocations, the youngsters learned to think how scientists do, facing a real research project, rather than having some theoretical preparation and deepening into advanced subjects. Participants learned to search information, formulate hypotheses, lay out experiments, interpret results, discuss, listen, have a critical and somehow sceptical attitude towards the information they receive and consider all possible explanations. This is the appeal of science: doing it.

2. Suitability of scientists

One distinctive point of this experience is the work of youngsters with scientists who are active in the field of the projects done. These scientists are the role model of the participating youth; their enthusiasm and dynamism, their devotion to science, their way of thinking and acting, discussing, encouraging and asking for things has been

crucial for the experience to result in a positive discovery of the world of science.

3. The group of participants

The success of the programme depends on the benefit participants take from it, turning the stage into a dynamic and enriching experience regarding both their personal and strictly intellectual development. On this campus, youngsters play a leading role in their learning. Hence it is indispensable that they are ambitious, get involved and have an interest in scientific knowledge and are ready to do an effort – by having fun. Being a scientist is not only a job but also a life attitude.

Youngsters play a leading role in their learning; it is indispensable that they are ambitious, get involved and have an interest in science and are ready to do an effort – by having fun.

One of the most relevant points in this first experience was precisely bringing together 53 youngsters from all over Catalonia with similar interests, ambitions, hobbies and intellectual capacities. The degree of work, group dynamics, activities and in-depth conversation has been unique and very encouraging.

Participants were recruited in a laborious, thorough process, the more so considering that we received about a thousand applications.

Recruitment of participants

First of all, with the aid of the Directorate General of Educational Innovation of the Department of Education of the Government of Catalonia, we sent out the information on the stage to all secondary schools in Catalonia so pupils with an attitude and ability for science could apply. How did we come to recruit these



▲ At the E²C³, youngsters learn to think like scientists.

53 youngsters? What means having talent for science in this age?

During recruitment, the intellectual potential, curiosity, creativity, involvement, interest, capacity to be fascinated, will to learn continuously, perseverance, empathy, generosity, honesty and frustration capacity were assessed.

Recruitment of participants was based on different items, none of which alone is a reliable indicator of the profile we were looking for, but they altogether allowed us to make a balance between different points we believed to be relevant to define talent. On the one hand, there is intellectual ability, which is necessary but not enough to become a promising scientist. There are fields of science requiring different abilities

– capacity of mathematical analysis and abstraction required for a theoretical physicist is not the same as the capacity of meticulous observation and infinite memory of an entomologist. Generally speaking, however, scientists need to be able not only to assimilate data and concepts and relate them with phenomena they observe, but also to create new knowledge in a stringent, analytical and logical way. This intellectual exercise requires forcibly as many and diverse specific abilities as possible.

Participants and scientists learned, thought and discussed together, besides sharing leisure with music, games and long walks. This is the way to get far!

Besides intellectual abilities, there are aspects related to attitude that are as important as talent indicators or maybe even more. Curiosity, creativity, involvement, interest, capacity to be fascinated, will to learn continuously and perseverance are elements a scientist needs to feed the process of their vocation. As there are jobs producing immediate results, scientific research is a long-haul undertaking. Scientists need to be able to live with frustration and turn it into a stimulus to go on doing research.

Social and personal abilities are also basic. Scientists work increasingly in teams. It is important to recognise own limitations and give value to the colleagues' abilities as well as being able to lead and create a productive work environment. Empathy, generosity and honesty create the code of ethics, the necessary framework of interaction for any collective action. Science is not an exception to this. Goodwill without knowledge is not useful for science, but knowledge without goodwill is dangerous.

Being aware that measuring each of these items in applicants is impossible and that we needed a way to approach them, we set up an application procedure that would allow us to assess academic, life attitude and personality issues of applicants

through different ways. Pupils had to send in the application form with their school record and a letter of intent. A brilliant school record is usually an indicator of certain intellectual abilities and a spirit of effort and work. In the letter of intent, pupils explained what they believed we should know as to their motivations, personality, merits and extracurricular activities. We wanted to detect originality, interests and creativity besides the more formal issue of how to write and submit a letter. Also, a science teacher and a board member or coach had to fill in a confidential form by which we should assess different aspects of the pupil: intellectual ability, curiosity, communication skills, perseverance, ability to work, attitude towards problems, responsibility, empathy, leadership, teamwork capacity, etc. With these data we pre-selected 102 applicants, whom we interviewed. The interview was the key to confirm firsthand what the letter, record and teacher assessment suggested. We evaluated both personal traits (motivation, scientific interest, curiosity) as well as such related to scientific intuition and creativity.

There is much talent, and everywhere! Political imagination, a genuine interest and daring initiatives are needed to have this talent develop and emerge. We cannot deceive them – our future is at stake.

The mere fact of recruiting is very important, as the group feels honoured and with responsibility to do their best. Enthusiasm, curiosity, capability and will to work of participants and scientists fed back each other, and new activities and talks with researchers had to be improvised to answer the questions the pupils were asking and satisfy their curiosity. Participants and scientists learned, thought and discussed together, besides sharing leisure with music, games and long walks. This is the way to get far.

Each criterion used is subject to variations according to the school, teacher and evaluator. After the experience with the stage, we believe

that the criteria used to recruit applicants has been overall very good. The stage participants were all excellent; there was no error here. However, it is perfectly possible that some excellent youngsters have been left out. In fact, the programme was set out for 50 youngsters, and we finally had to enlarge it slightly to 53.

This first experience has taught us a hopeful lesson: there is much talent, and everywhere!

Political imagination, a genuine interest and daring initiatives are needed to have this talent develop and emerge.

The Youth and Science programme of Caixa Catalunya will not change the scientific landscape in Catalonia, but it has opened the eyes to a group of 53 teenagers who we expect will tackle high school with a greater ambition. We cannot deceive them – our future is at stake.

MARIA CALSAMIGLIA

Graduate in veterinary medicine at the Autonomous University of Barcelona and PhD in veterinary pathobiology at the University of Minnesota.

Professor in Aula Escola Europea and director of the Youth and Science programme of Caixa Catalunya.

A former researcher at the Animal Health Research Centre of the Autonomous University of Barcelona.



MIQUEL PERDIGUER

PhD in Economic and Business Science at the University of Barcelona and diploma in Marketing at ESADE.

Director of the Social Work department of Caixa Catalunya.

Collaborator in the master on Banking and Finance at IDEC, Pompeu Fabra University.

A former professor of financial marketing at IESE and at the two editions of the master in Finance at Deusto in Barcelona. At Caixa de Catalunya, he has been marketing director, member of the Assets and Liabilities Committee, advisor of the Management and Securitisation Society committees and manager of a SICAV in Luxembourg.

