

Can research-based activities address social exclusion?

Camille Breton¹⁻²

Catherine Oualian¹

Amandine Galioot¹

Leila Perié¹

Livio Riboli-Sasco^{1,2}

¹ Association *Paris-Montagne*, École normale supérieure

¹ Corresponding authors: camille.breton@paris-montagne.org
& livio.riboli-sasco@paris-montagne.org

Abstract

As a response to the riots in the French suburbs in 2005, a team of students decided to set up a nonprofit, *Paris-Montagne*, whose main programme, *Science Académie*, aims at promoting research-based activities to address the social exclusion that besets teenagers living in the neighbourhoods where the riots happened.

Altogether, more than 800 youngsters from 15 to 18 years old participated in lab internships. Other research-based activities were then created such as a science festival, science weeks, conferences, mini-research projects in English, enabling students to experience the core values of research: critical thinking, teamwork and rationality.

In order to achieve these objectives, Paris-Montagne had to develop and refine tools to

permit young people to make informed decisions regarding their futures. From training sessions for research mentors to initiatives in listening to young people, Paris-Montagne has been putting the emphasis on empowering teenagers. Over the course of nine years, challenges emerged such as whether to involve participants in the governance of the NGO and whether to continue as an all-volunteer organization. Responding to these challenges has allowed the institution to capitalize on its experience, strengthening national branches and taking part in international projects.

We hope this paper will enhance reflection and discussion for those involved in organisations also willing to conduct enquiry-based activities for socially excluded youngsters.

In November 2005, riots broke out and spread rapidly throughout the French suburbs. The first incidents sparked off in an urban region in the northern suburbs of Paris. They rapidly induced a whole new level of violence: assaults on buildings, battles between the police force and the local population. Following these riots and the ensuing media coverage, questions emerged amongst the public. What triggered these riots? What message did they convey? Was it an expectable reaction considering the suffering and oppression experienced by these populations? There is no definitive answer to this type of question, even if numerous studies and press articles highlighted alarming data on the living conditions (unemployment, discrimination, education drop out...) in the suburbs. We would like to share an initiative using Science in Society that was triggered by these events. As similar situations have occurred in other countries (UK summer 2011, Sweden Spring 2013), we hope the initiative will be of broad interest.

The objective of this paper is to foster reflections on the so-called “Science in Society” activities in relationship with political goals of social inclusion.

The first section will highlight the different initiatives led by Paris-Montagne and its outreach programme, the Science Académie, as well as offering a reflection on the successes and failures that we have had to acknowledge during the past 9 years of action. The discussion will proceed with an observation on the methods set up and constantly refined by Paris-Montagne to address social exclusion via research-based activities. The

last section opens a discussion on current challenges and hopes for the future.

All data and ideas presented in this paper are grounded in surveys we conducted ourselves. From 2007 to 2010, Sandrine Karam and Mathilde Labbé, two sociologists together with a team of doctoral students, interviewed different pools of participants of the Science Académie programme. These individual interviews were carried out at the end of each activity, from February to July of each year. The objectives were to evaluate both the quality and appreciation of the activities from the participants' points of view and to achieve a more general perspective on the programme through the comments of various actors. From 2011 onwards, we have been working with graduate or doctoral students in sociology to continue with this process of refining our activities using field surveys.

Science académie: getting the youth from the suburbs in the labs

In the context of the French riots, researchers and university students decided to set up a programme that would enable young people to get into research labs and therefore acquire skills that would lead them to develop themselves as active and responsible citizens in their communities and society at large. One of the main strategies was to offer an opportunity to discover the research community, whose founding values are critical thinking, rationality but also teamwork. In addition to this premise, Paris-Montagne hoped to fight the self-inhibition that afflicts youth from segregated populations. The aim was to achieve this by providing enquiry-based activities (see Blanchard and Wenden) throughout the year and mainly during school holidays. The teenagers targeted by the programme were those living in underprivileged neighbourhoods and interested in Science. Even if it is unlikely that the teenagers in question were directly involved in the riots, they suffer just as much from the degrading situation of their neighbourhoods and feel excluded by society for the same reasons. We also made the bet that if benefited themselves they would in turn have a beneficial effect on their communities. During the first years (2006-2008), Paris-Montagne had benefitted from a strong political support from the national government, which enhanced the impact and provided visibility to the actions. Furthermore, it is important to mention that support from academic institutions and in particular Ecole normale supérieure, the programme's

basecamp, generated trust from funders towards a programme mostly led by young students (aged 20 – 23).

Most of the activities developed by Paris-Montagne revolve around an outreach programme named Science Académie. As mentioned above, the idea is to enable young people unlikely to engage in higher education—but already interested in science—to get into research institutions. In order to do so, the Science Académie offers internships in research labs (originally STEM labs, recently complemented by humanities & social sciences labs). Today, this still remains the main programme with more than 300 students each year, selected only on their motivation rather than grades, having performed internships in 144 labs in 2013. Other activities were developed later, such as interdisciplinary science weeks, conferences on career opportunities in science, participation in scientific summer schools abroad as well as small-scale research projects held in English.

The Science Académie initiative managed to expand geographically to Lyon, Lille, Montpellier, Toulouse, Nancy, Limoges and Nouméa (New-Caledonia). Since 2006, more than 2,000 teenagers have been invited to participate in our activities, 826 of them have taken part in lab internships and 34 science weeks have been organized on different topics such as: music and science, superconductivity, hydrodynamics, Einstein, nutrition, medicine... Each year the majority of the participants are girls (more than 60% in 2013). This high number of girls is not surprising once we take into account sociocultural characteristics. Girls tend to find it easier to express their motivation for science, while boys are afraid to tell peers and parents that they like science (according to studies done by M. Labbe & S. Karam from 2007 to 2010).

The number of children from families that receive financial help from the state (thus the lowest socioeconomic classes) remains stable in every branch of the programme (approx. 20% each year). The remaining 80% still come mostly from deprived and impoverished areas, mostly populated by migrants. However, we remain open to welcoming children from intermediate socioeconomic classes, to avoid unwittingly reinforcing social segregation through our programme.

90% of the high school students engaged in the programme pursue scientific studies, even if it is not the primary goal of the programme (data collected on 20 students in 2009). We

can't exclude the possibility that this very high score for such category of students is due to a bias in the initial self-selection. Importantly, the teenagers, after following these research-based activities, develop a realistic vision of research, acknowledging its power (questioning, evidence-based etc...) as well as its weakness (long working hours, hierarchical problems, misconduct etc...). We emphasize that being realistic about a career in research should not prevent students from engaging in science but rather illustrates that science is like any human activity, and therefore perfectly accessible to them. In addition, being realistic in this way makes it more likely that the teenagers will be able to translate what they have learned into their own lives, which is far from being easy. We shall not forget to mention that the teenagers often stay in touch with the researchers that host them in their lab, continuing to interact directly without our mediation.

Throughout this diverse range of activities, we have created a community of young people motivated by science and research. We see that they stay in touch with each other, organize social events on their own (for example some conduct treasure hunts in Paris four times a year, to discover a city they do not know well, as they live in the suburbs). They express that they feel less isolated than before and that they enjoy sharing their passion and constructive attitudes with one another.

Empowerment process: methods and refinement

Even if the word empowerment is, in French, an English lexical loan, it is widespread in the field of education studies. Andrea Bandelli, who has studied this approach, gives a clear description of techniques that aim at empowerment: “[they allow] people who would normally stay away from conversation [...] to [...] meaningfully participate in a discussion, bringing their own perspective and experiences around items and facts that are shared by the public”. Paris-Montagne has made empowerment an overarching goal of its science in society activities. A wealth of examples could be described. We will detail one, based on a debate that occurred during one of our recent science weeks involving three groups of teenagers. The small groups were given a series of instructions: in the context of a forthcoming water shortage, draw a political agenda and explain your choices to the other groups and mentors. To do so, they had to use both

the internet and the knowledge they had acquired during the week with the researchers they met. After 30 minutes they had to come up with a proposal containing three political measures. For the purposes of this article the interest does not lie in the solutions they offered but in the methodology. Not only did they have to estimate the consequences of their proposals but they also had to embrace various disciplinary approaches to the issue. They were encouraged to combine knowledge and research methodologies from the fields of economics, ecology and sociology to analyze a given issue. As Lévy-Lebond puts it, “It is more about knowing how to know than just knowing: what and to whom shall I ask for? look for? read about?”. Unsurprisingly, this methodology has strong democratic goals: it strengthens self-engagement, group reflection, self-coherence, a balance of rationality and values, critical thinking. Other aspects of empowerment should be evaluated, such as students’ involvement in an NGO, the ability to transpose their acquired skills to other aspects of their life, etc. We currently lack tools and funding to conduct such evaluation.

Most new activities have been added according to needs expressed by the participants and developed thanks to the contribution of our employees and young scientists who are volunteers in the association. We believe it is necessary to give space to our target groups to express their views, take ownership of the activity and contribute to its improvement. We use classical tools such as questionnaires but we also listen to informal comments and oral requests. For example the activities held in English were designed as a response to the need to speak English with researchers who were hosting the participants during their internships. This connected to difficulties in learning English at school, which would remain a strong barrier in their learning journey. Even if one can question the lack of multilingualism in research—especially in natural sciences—(see Jean-Marc Lévy-Leblond), one cannot dispute that nowadays English is the lingua franca in research. Mastering it, together with other languages, is liberating. While offering pure English tutoring would hardly be motivating for our target public, it is possible to teach it when introduced as a tool for being more at ease within the scientific community. A short scientific project collaborating with Italian young people permitted us to create an exchange space where scientific communication requires English.

As we mentioned earlier, one of the overarching goals of Paris-Montagne is to

enhance citizenship via initiation in research practices. Even if attaining this goal is difficult to evaluate, the history of one of the participants illustrates the intention.

C. was a participant from the very first year. He was living in one of the toughest suburbs of Paris, right where the riots started. He arrived from Kinshasa in the Congo at the age of 12. After being involved in the Science Academie summer camp, C. set up a robotics club in his high-school, securing some funding on his own after writing to the mayor of the city. As this was a “science” club, they liked asking questions, any questions. Even questions such as: “why is there violence in our suburbs?” He invited Edgar Morin, one of the most famous French sociologists, also a respected member of the Resistance from WWII, to give a lecture in his high school. Later on, C. attended university for science studies and while there he created an association for students to organize scientific and philosophical debates, inviting renowned speakers and showing that young students could take the initiative to “think”. Today, C wants to become a teacher and is still very interested in politics.

In order to improve the interaction between a researcher and a participant, we have developed, since 2010, training sessions in science communication. We targeted PhD students for these training sessions for two main reasons: first, PhD students already have to attend mandatory trainings and we could therefore insert ours within this mandatory training scheme (while active researchers have no such obligation); and second, we expect to create a long-term change in attitudes within the academic community by targeting scientists in the early stage of their career. Theoretical sessions enable these young researchers to understand what science communication is about, to learn about the historical evolution of the “science in society” field, to propose good reasons for them to take part and warn them about the challenges they may face. Surveys of PhD students that we conducted helped us to design the trainings. We know that the most cited barriers to participation are: “too time-consuming”; “I am scared of not being interesting for my intern”; “my research topic is neither fun nor fantastic”; and “my colleagues do not understand why I would like to do this” (data collected during brainstorming sessions with PhD students). This may be balanced by the positive inputs and outcomes which are: “I can share my knowledge and help the participants better understand the different stages of the research methodology”; “I wish I had that

opportunity when I was their age”. The training provides PhD with a toolbox of role models, answers and possible activities to make the most of the internship and to sustain dialogue with their young interns even after the internship is over. Through this training programme, we make sure that the young researchers will not adopt a top-down style of knowledge transfer, known as the “deficit model”, and will instead engage participants in action really based on real research practices, far from the school-like science learning.

Future challenges in addressing social exclusion

Our achievements should not hide numerous questions, doubts and failures accumulated over the years that we consider likely to be shared by organizations wishing to get involved in similar activities. To begin with, how could these practices be enhanced so that participants learn most from their interaction with researchers? Also, how sustainable and effective are our research-based activities?

To date, Paris-Montagne is involved in the SiS Catalyst project and especially in a work package about listening to children. This work package entails a project wherein the consortium members identify ways of embedding children’s reflections on science and society activities in order to influence higher education institutions. To do so, the different partners led a series of workshops across Europe. The focus point was the expectations of young teenagers for the world they live in, especially in terms of education. Paris-Montagne stepped into this work package and, as part of a systematic process, replicated its activities.

Doing our best to listen to our participants did not start with this European project. Back in 2008, the Board of Administration decided to involve the youngsters in the governance of the association. A dedicated electoral college was created. They were now able to express their opinions about any matter, submit new proposals and vote together with representatives of the scientists volunteering in the association. This transition did not turn out to be a smooth experience, at least from the youngsters’ perspective. Not only did they have to vote on starting a new interdisciplinary week or affecting a certain budget for their peers to attend summer programmes abroad, but they were also expected to contribute to decision on human resources such the redundancy of employees due to lack of funds. These were difficult issues for which they did not wish to

take responsibility. Also, it may be hard to make decisions on activities targeted at low-income populations when you come yourself from low-income groups. One rather denies the discrimination one suffers from. This situation has been well described by Bourdieu as symbolic violence. Knowing that our communication strategy does not explicitly state that the participants are being targeted based on socio-economic status, they only implicitly (and not always) realize it when they meet their peers. As we later recognized, instead of spending long hours in board meetings late in the evenings, they should rather focus on their studies. Many partners among the SiS Catalyst consortium made similar observations after implementing committees to listen to their own target groups (see Merzagora and Rodari) .

On our side, we decided to evolve from inclusive governance to the facilitation of open initiatives. We guided some participants on their own projects, whether science weeks in their high school or a rock opera about science discoveries. This short-lived shared governance experience raises various questions: what is the appropriate level of participatory governance when dealing with young people from poor communities? What is our liability in doing social inclusion activities only implicitly? What would be the challenges of doing explicit rather than implicit social inclusion?

Most actions of Paris-Montagne are voluntary, which means that both participants and members of the research community take part as an individual initiative. Out of deference to the participants, we decided that neither parents nor teachers should be involved in the application process of the programme. Students come during their leisure time (holidays and weekends). For example during the summer youngsters who took part in activities during the year (all over France) are invited to participate to a summer camp held at École normale supérieure, in Paris. After a few ice-breaking and teambuilding activities, the participants spend the whole week building science communication materials to be presented during our science festival. Visits to research labs allow them to enrich their materials. By the end of the week, they have become science communicators. This represents a big step in term of change of attitude. From being shy beneficiaries of activities that allow them to discover science, they become science communicators themselves, sharing their passion with curious younger children attending a science festival.

Voluntary participation limits the number of kids we can reach. Indeed, despite teachers' involvement to encourage their pupil's participation and their help during the registration process (practically speaking), we are not formally bound to any school or Local Education Authority. This limits our educational legitimacy (but not our educational impact). This is certainly one reason for the decline in the number of application we have received over the last 2 years. Other reasons may be connected to a global frustration of populations living in impoverished areas of France and not seeing any improvement in the recent years. For a few years now, we have reckoned that it would be profitable to enhance teachers' participation in our activities. This may enhance participation from youngsters and benefit teachers as well. We wish to equip teachers with the skills to share their pupils' recently acquired and fragile knowledge and to teach science as an uncertain investigation process.

On the same subject, yet with different challenges, we shall also analyse voluntary-based participation of young researchers. PhD students participate in our activities more than any other constituency within the research community. They do it with the support of their graduate schools, but they nonetheless speak freely. On the one hand, they always spoke frankly to the students who take part in our programmes. This allowed our participants to discover the downsides of the research world from the mouth of their hosts and to dissolve pervasive stereotypes (see Lafosse-Marin "Draw me a scientist"). They came to realize that researchers can be women and that teamwork between several professions is central. On the other hand, researchers do realize that young people, even without prior experience and even if they come from poor families, can be highly talented and motivated. Research would benefit from a diversity of people (research questions may address a wider array of topics for example) and our actions contribute to reach this goal. International diversity has long been recognised as essential and it is time to contribute to social diversity with the same impetus and the same level of funding.

In order to go a little deeper, we shall consider the problem of institutional support. We do not benefit from a strong financial partnership with research institutions like other programmes do, such as La Main à la Pâte in France, or Kut Diak in Hungary, both supported and hosted by their respective national science academies. Each year, we

need to renew our agreement with research institutions to involve PhD students and their superiors to host the youngsters. Just as with teachers, we would like to set up long-term contracts with research institutions and graduate programmes in order to secure sufficient and stable numbers of participating labs. Although we do have partner institutions helping us to disseminate information about our activities, we lack sustainable financial support altogether. This affects our ability to maintain the viability of our national branches. Indeed, when combined with professional constraints affecting the volunteers, the financial barrier caused three of our branches to step down from the project. However, we have the urge to sustain and expand this network. To do so, we are currently developing toolkits to easily establish and manage the local activities. This is intended to help the people in charge of the programme, while taking into account that the economic crisis in Europe has affected voluntary contribution from people in their 20s and 30s who already have to face difficult situations on the job market. This same economic context has also led to severe cuts in the budgets of public institutions that once supported our action. We were forced to reduce the number of staff. This reduces drastically our ability to innovate. Nowadays, the challenge lies in our ability to propose new activities at a lower cost, while taking the opportunity to sell (at a reasonable price) our expertise to institutions willing to develop science communication and informal science education activities all over Europe. Even we cannot currently achieve our goals as much as we wish to in France, together with other countries we can still establish a catalogue of research-based activities that bring underprivileged social groups into research and encourage citizen participation.

The various activities and reflections led by Paris-Montagne suggest that research and its community can play an active role in overcoming social hindrances for young people coming from or living in poor, disadvantaged or marginalized environments. We achieve this by giving youngsters the tools to gain self-confidence, to make appropriate and conscious decisions for their future and to participate actively in society. Research fosters social skills as well as intellectual ones.

This line of action also challenges the research community. It is an invitation to reflect on the strong discrimination—gender-based, social, cultural, ethnic, linguistic, religious—currently affecting access to academia and to highlight the need to break stereotypes and

empower younger generations.

Nonetheless, our action still raises many questions. We still need to know the exact degree to which we contribute to empower people and the variability of our impact. To do so, we need to work in collaboration with social scientists on the impact of these activities, for example by interviewing those who participated in our early years. We wish to know more about the choices they made after their participation to the Science Académie, and therefore about the long-term impacts of our actions, something of which we currently have a very limited idea.

We should also mention the risk that some institutions will adopt our goals for branding purposes, without genuinely contributing to them. Reducing social gaps has been made compulsory for the private sector with the RSE measures (Responsabilité sociétale des entreprises) (corporate social responsibility measures), and unfortunately it has become “trendy”. The worst-case scenario is that young people’s situations and living conditions are exploited in ways that dramatically increase social divisions.

If we were to consider our impact on society at large, we could say with certainty that our actions have made a significant change in some people's lives (study choices, initiative taken in society). No global change is within reach. But we can still act with strong political commitment and a strict respect of fundamental democratic values.

Acknowledgements

Some of the reflections developed below and the actions implemented have been developed thanks to the support of the European project SiS Catalyst, a 7th Framework project to foster the dialogue between the young generation and educational institutions in general.

We thank the funding institutions (Région Île-de-France, Fondation Bettencourt-Schueller, ACSE, École normale supérieure, European commission, INSERM and the Université Paris-Sud), Jonny Thakkar for the editing of this article, the participants of the Science Academie programme, in particular those who took part in our multiple evaluations and the researchers who volunteer to make our project a reality.

Bibliography

BANDELLI, A. (2010). Engagements tools for scientific governance. *Journal of Science Communication*.

BLANCHARD, A., & WENDEN, B. (2008). Showing science in action through scientific writings. *Didaskalia Issue 32*, pp. 185-189.

BOURDIEU, P., & PASSERON, J.-C. (1970). *La reproduction. Éléments pour une théorie du système d'enseignement*. Les Éditions de Minuit.

FERRINI-MUNDY, J. (2013). *Driven by diversity*. Science.

KEPPEL, G. (2010). *Banlieue de la République, Société, politique et religion à Clichy-sous-Bois et Montfermeil*. Gallimard.

LAFOSSE-MARIN, M.-O., & LAGÜES, M. (2007). *Dessine-moi un scientifique*. Belin.

LARQUE, L. (2007). Au chevet de la culture scientifique et technique. *Alliage Issue 59*, pp. 10-19.

LÉVY-LEBLOND, J.-M. (2003). *Science, culture et public*. AECYA.

LÉVY-LEBLOND, J.-M., & OUSTINOFF, M. (2007). *Hard Science and translation*. HERMES.

MERZAGORA, M., & RODARI, P. (2013). The challenges and opportunities of letting children have their say. *Journal of Science Communication*.

RIBOLI-SASCO, L., RICHARD, A., & TADDÉI, F. (2006). *Science Académie: Raising Passion and Fostering a New Social Link*. *Federation of European Biochemical Societies Issue 6*.

The various field surveys are available at <http://www.paris-montagne.org/science-academie/bilans>