

CONFERENCE PROCEEDINGS

Extract from Prof. Paulo Blikstein 's lectio magistralis "The maker movement at school: a turning point in the democratisation of education".

"The Maker Movement in education: it only works if it is for everyone"

*Florence 12/12/2017, edited by Antonella Sagazio
Translation by Giulia Lombardo*

The four principles of the Maker Movement

The Fablab is a laboratory for experimenting that which has been studied, a physical space containing tools and people capable of supporting learners. At present, the makers, the digital artisans, are an active community which has been promoting for many years the dissemination of their methods in education. Four main principles can be drawn up from the experience and constant research carried out by the makers operating in schools:

1. Students are thinking subjects, they don't passively receive information but interpret it, and elaborate their theories on the world on the basis of what they have learnt.
2. Teachers are intellectuals, they are not technicians following only pre-set procedures. They are knowledge workers carrying out a difficult profession. Teachers are nowadays faced with many challenges every day, including teaching to students distracted by many technological devices in the class (computers, tablets, smartphones).
3. The educational context plays a pivotal role. Students are immersed in a cultural environment which influences them, therefore everyday they bring into the classroom values, stories and unique experiences.
4. Technologies are cognitive amplifiers. Their ultimate function is not transmitting information but enhancing human capacities. They are instruments able to increase the learners' knowledge capacity. Information and communication technologies are cognitive tools which can play a significant role in the

teaching and learning process. In particular, they facilitate and simplify the access to information and communication with other individuals.

Equality and equity in Education

Everyone should have the same educational opportunities, democratisation of education must be the final goal of modern educational systems. For many decades, in order to promote these concepts, we tried the path of uniformity and massification by providing the same contents to everyone. Over the centuries, we witnessed the evolution of educational technologies, created to distribute the same contents, in a massified way, to an increasingly large number of people: from print, tv, testing machines, radio, to online learning environments.

Grasp change in order to innovate and democratise education

Today we are experiencing a profound change in school education which is due to many factors. In the last 15 years we witnessed a progressive decrease in the cost of technology. Today schools can access, with little effort, to hardware and software equipment adequate to set up a robotics laboratory. This is a crucial element to enhance the relationship between new technologies and learning. Pedagogy also evolved: the constructivist theory has placed the student at the centre of the educational process (learning-centred approach). These elements led some countries to kick start a real revolution in education which has overthrown the old methods. The maker movement grasps this change and wishes to take advantage of this great possibility to innovate school education.

The maker movement's frontiers

The maker movement is expanding all over the world, also in the poorest countries and aspires to the democratisation of education. The movement is engaged on four frontiers:

1. Integration of new technology in core subjects, both scientific and humanistic. The movement is willing to create an educational project integrating new technologies and enhancing learning. For many years, the Bifocal Modelling has been studied at Stanford University. This is a method alternating practice and theory. 2. Maker in real life, that is taking the maker experience out of the school walls. In FabLabs all over the world the students have

INDIRE is the National Institute for Documentation, Innovation and Educational Research. With a 90 year history, it is the Italian Ministry of Education's oldest research organization and is the benchmark for educational research in Italy. It was created in 1925 with the task of collecting and valorizing the work done by the schools of the time, accompanying the evolution of the Italian school system over the years. Thanks to its roots, INDIRE possesses a historical archive containing an abundance of documents from the 19th-20th centuries, specializing in the collection of documentary material of historical/educational interest. It is engaged in promoting innovation processes in schools: by developing new teaching models, trying out new technology for training courses, and seeking to redefine the relationship between space and time in both learning and teaching. INDIRE is also the Italian Erasmus+ Agency for Schools, Universities and Adult Education. Contacts: Antonella Sagazio – a.sagazio@indire.it - tel. 055.2380760

the possibility to create objects useful for their everyday life, such as creating a hydraulic system in a school where there wasn't one, or building a Segway (a means of transport facilitating commuting from home to school) out of waste materials. The connection with learners' everyday life is fundamental. Research demonstrated that interested learners learn more and quicker. 3. The importance of research. It is necessary not to devalue the learning process, because building something, in itself, doesn't mean learning. Research plays a crucial role because it helps to analyse and understand phenomena, in order to provide us with the most appropriate tools and didactic methods to achieve the desired goals. 4. The importance of the maker community is crucial to provide the possibility to create and share replicable models in public education. Prof. Blikstein has been promoting for many years, all over the world, the "FabLearn Program", an international network of makers, including schools, universities, students and various partners. This programme helps institutions to build maker laboratories with low budget technologies and provides assistance in the methodology and the training of teachers. Moreover, it organises international conferences. Low budget educational tools are also promoted (for example Gogo board, an open source device to carry out robotics educational projects and scientific experiments).

How do we measure the success of this educational method?

The maker movement emphasises that "the product is not important but the process which led to the result is". Even if the product won't be perfectly functioning, the process which led to it will be valuable from the learning point of view. Also, parents should be encouraged not to give importance only to the final marks, but to the commitment and passion that their sons and daughters have put into their projects.

The great opportunity for school education

In this new idea of school, the "maker teachers" will support the teachers of traditional subjects, in order to help them in the re-planning of the lessons and to structure functional "maker spaces" in the school. Today, the new generations of students and their teachers have a great opportunity to become the protagonists of the turning point in the democratisation of education.

"The Maker Movement in education: it only works if it is for everyone" (Paulo Blikstein).

Read more

[The complete video of the Lectio Magistralis](#)

[Free book on the maker movement](#)

FabLearn Program, <http://fablearn.org/>

Gogo board, <http://gogoboard.org/>

[TLTL, Transformative Learning Technologies Lab, Stanford University California](#)

[Paulo Blikstein's Lectio Magistralis, Indire.it](#) - 27/12/2017, *indire.it*