

Expo Milano 2015: Supporting a World-Wide Educational Experience

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Abstract

The Universal Exposition taking place in Milan, in 2015, has decided to have a decisive impact on the future citizens of tomorrow in relation to its crucial theme: “feeding the planet, energy for life”. HOC-LAB (a laboratory at Politecnico di Milano, one of the largest technical universities in Europe), officially in charge of running the competition for schools by Expo Spa, has thus prepared (and tested through a pilot edition) a number of educational supports to enhance teachers’ and students deep understanding and change of attitude on the Expo issues: sustainability, biodiversity, world-hunger, inequalities and so on. “PoliCulturaExpoMilano2015” is the result of the effort: it entails a competition for schools from all over the world, based on digital storytelling; 3 Massive Online Open Courses (MOOCs) on digital storytelling and the Expo themes; a powerful set of educational resources (more than 300 pages of interviews to experts, being published as a series of eBooks on Amazon), educational guidelines prepared by a staff of teachers volunteers, a “Time-Bank” where teachers can trade help and support as money. This paper describes the project (goals, design, deployment, evaluation), the pitfalls and the successes of this first example of world-wide educational effort. PoliCulturaExpoMilano2015 is a successful format that aims at being replicated at every new Universal Exposition.

Introduction

School systems (and school curricula) are one of the fields that have been less influenced by “globalization” that is heavily affecting most human activities. The way schooling is organized, the way content is selected and delivered, the way learning and teaching strategies are organized, the way students are admitted and graded, get a different approach from country to country.

Using the TPACK model [Mishra, Koehler, 2006], we may say that if Technology at school, in principle, is globalized (but in practice it is different from place to place), Pedagogy is, in principle, only partially globalized, and Content is very much localized (with the exception of math-science subjects). Scientific subjects (e.g. math, physics, chemistry, biology, ...) are similar across countries (but, in any case, they are taught with different approaches), “sensitive” subjects (e.g. history, geography, economy, literature, philosophy, religious studies, etc.), which contribute to shaping citizenship, are inevitably taught according to a very national, if not “nationalistic”, curriculum.

The authors of this paper have deployed an educational experience (based on multi-users virtual environments supported by 3D graphics) about national identities in 18 European countries and the USA [Di Blas, Paolini, 2014; Di Blas et alii, 2012; Di Blas et alii, 2006]. We did realize that, even in a relatively homogenous region like Europe, history was taught in a totally different manner from country to country; taking a European as opposite to “national” approach to history was a major breakthrough.

There are a number of reasons for this situation. Among the good motivations we can list tradition and the necessity to take into account the specific needs of each country. Among the less acceptable motivations, we can list the will of each country of protecting the local culture, by shaping the citizens of tomorrow according to local values and beliefs, which are different from country to country.

Technology, today, makes it possible to conceive a world-wide education: content delivery, discussions, lectures (through videos), question-answering sessions, tests, ... can all be deployed overcoming physical and therefore national barriers. This globalization happens in the field of research: many researchers are more in touch with researchers of the same field located in different parts of the world, than with the colleagues next door within the same building. Globalization is not happening, instead, for school systems, which are constrained by their physical location, making it very different going to school in Europe, with respect to Asia, Africa, USA, Middle East ...

It is symptomatic, for example, that the European Union (assembling 27 different countries) does not have schooling as part of its mission; schooling is left to individual

countries. We may wonder how it is possible to shape the European citizens, or the “world citizens”, of tomorrow in this situation where each school system conveys the explicit or implicit message: “we are the best and the brightest, while the rest of the world...”

Changing school systems worldwide is of course a very long-term dream; an agenda towards this goal does not even exist and even if it did, it may not be shared by many people. Still, something can be done today, exploiting the affordances of technologies.

Following several years of research (and deployment), we (at HOC-LAB of Politecnico di Milano) have devised the idea that “digital storytelling” could be a common approach, that can be offered to schools of all countries [Di Blas, Paolini, 2013]. Developing a multimedia narrative is a technology-supported educational activity, rewarding for students, related to contemporary living style, ensuring educational benefits, that can appeal to all schools and all teachers. In order for the Digital Storytelling to be global, however, also a common subject should be proposed: something with global and local flavor simultaneously. “Glocalization” works, as we had learned with our previous experiences [Di Blas et alii, 2006]: allowing teachers and students to express their local identity in a global context. Pride for one’s own specificity goes together with the framing of one’s own identity into a global picture (an educationally crucial step).

The Universal Exposition of Milan in 2015 is the perfect opportunity to test this approach. Expo Milano 2015 (www.expo2015.org/en) is about “feeding the planet, energy for life”. The subject is global, 147 countries are involved, 20 million visitors are expected: Expo Milano 2015 is thus the right occasion for involving schools in a world education experience and overcome national boundaries. Every 5 years, there is a different Universal Exposition; the next one will be in Dubai, in 2020, and about “*connecting minds, creating the future*” (expo2020dubai.ae/en). *The Milano Exposition can be seen as the starting point for a new strategy to involve schools from all over the world, in cycles of 5 years, about each different Universal Exposition. PoliCulturaExpoMilan2015 is the activity deployed in Italy, but with a world-scope, in the occasion of Expo Milano 2015: and this is the subject of this paper.*

PoliCulturaExpoMilano2015

Overview

PoliCulturaExpoMilano2015 is the official school contest by Expo Milano 2015, the International Exposition taking place in Milano, Italy, in 2015, devoted to the theme “feeding the planet, energy for life” (www.expo2015.org). The contest is run by HOC-LAB, a lab at the Department of Electronics, Information and Bioengineering of Politecnico di Milano (one of the largest technical universities in Europe).

PoliCulturaExpoMilano2015 targets schools of all levels and kinds, from all around the globe. The goal is to generate in the students (and the teachers) a substantial educational impact on the exposition’s issues, which range from agriculture to food preparation, from nutrition to world hunger, from biodiversity to sustainability, from food identities to traditions, from localization to globalization. In school year 2013-14, a pilot edition was run, which involved students from 9 countries (Austria, Belgium, Croatia, Greece, Italy, Latvia, Somalia, Spain, USA). The positive results, discussed in what follows, prove the efficacy of the approach.

The contest is enriched by a full array of resources, meant to support teachers and students. On the whole, PoliCulturaExpoMilano2015 entails:

The digital storytelling contest

A set of educational resources (documents, educational guidelines, an eBook series) based on interviews to experts

Three Massive Online Open Courses (MOOCs), on the Exposition’s issues and on how to tackle them at school, on digital storytelling in education and on how to take part in the contest. The MOOCs go with thriving communities of international teachers

A “Time-Bank” where teachers can trade help and support as money, to get their work done. In what follows, we describe in details each of the above.

The Digital Storytelling Contest

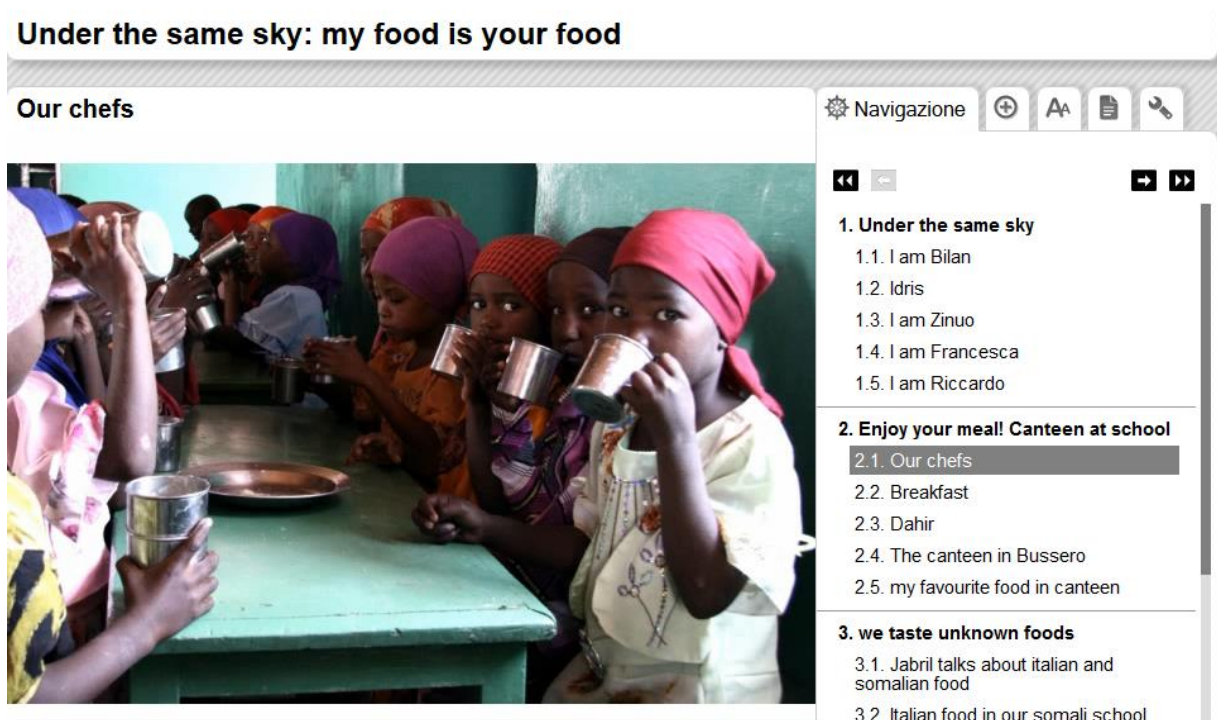
PoliCulturaExpoMilano2015 is a competition for schools based on digital storytelling. It builds upon HOC-LAB’s experience with a similar national competition that has involved so far more than 24,000 students as well as on insights gained through the European-Funded Comenius

project TALEs (www.storiesforlearning.eu), in which the lab is involved. Within PoliCulturaExpoMilano2015, groups of students/classes are called upon creating an interactive multimedia narrative, using an authoring tool by HOC-LAB: 1001stories. Participants are aged between 4 and 18. Their work lasts 4 months approximately, then a jury of experts (in pedagogy, multimedia communication and Expo related issues) evaluates the submitted narratives and proclaims the winners.

Participants can choose among different narrative formats, according to the effort they can profuse and their preferences: narratives can last between 5 minutes (the so-called “short” stories) and 20, 25 minutes (the so-called “complete” stories, more demanding).

The interactive multimedia narratives are organized into “chapters” and possibly “sub-chapters” (each lasting between 1 and 2 minutes). Each chapter can entail videos, images, audio and text. Figure 1 shows a narrative’s interface: the visual communication (either a video or a slideshow of images) lies in the middle, on the right-hand side the list of the chapters is offered. The text is visible on demand (by clicking on one of the options on the toolbar).

Figure 1. An example of narrative (pilot edition – school year 2013-14, cooperation between two primary schools, one in Italy and one in Somalia)



In order to create a narrative with 1001stories, participants are provided with a short user manual in which the main actions to create a digital story are described: choice of the topic for the narrative, gathering of the “raw material” (browsing the internet, interviewing experts, organizing materials previously gathered for other projects or school activities...), definition of the “storyboard” (how many chapters and sub-chapters? What chapters or sub-chapters?), creation of all the needed content, in multimedia format, upload of all the produced materials into the tool and eventually evaluation of the quality of the work. The whole process is highly beneficial in many respects, as will be discussed later, in the evaluation section of this paper.

Educational Resources

The Expo Milano theme, “feeding the planet, energy for life” is prone to simplistic interpretations by non-experts in the field, as school teachers are. Therefore, a comprehensive set of educational resources was created, to support a deep understanding.

First of all, a core content set, derived from interviews to experts, was prepared. Following a strategy already successfully implemented in previous projects [Di Blas et alii, 2006], 30 international experts on the various issues involved by the Expo theme were interviewed, via Skype. The interviews’ transcripts were reformulated and given the shape of educational dialogues in which topics like sustainability, genetics and agriculture, biodiversity, are discussed. All the interviews can be downloaded from the website (www.policulturaexpo.it/world/interviews-2). Each document is provided in two versions: a short version, aimed at stimulating the interest of younger students, without delving into complex details an extended version, with a level of details sufficient to capture the interest of older students (high school level), willing to tackle more complex challenges.

This set of documents, meant to support students’ and teachers’ deep understanding of these important issues, are meant to foster educational activities on the themes of Expo Milano 2015 for several years to come, as they are a crucial aspect of world citizenship. Interviews represent the tip of the iceberg if compared to the whole body of knowledge available on these topics, but they are an invaluable starting point for further research.

The interviews are also published as eBooks, distributed over the most used and well known platforms: the first eBook is already available on Amazon.com (mobi version, for

Kindle - <http://amzn.to/1D1ZZNP>) and will be soon be published also on iTunes and Google Play (ePub version, for iOS and Android).

The Expo 2015 educational resource series will include 8 volumes, to be published between January and October 2015:

- The interviews (3 volumes)
- Educational tips (2 volumes)
- Educational hints by teachers involved in the competition (1 volume)
- The abstracts of the digital narratives created by the classes involved in the competition (2 volumes)

The interviews are thought provoking; yet, it may not be clear how to turn them into concrete school activities.

With the help of over 30 teachers from our community, more than 1,000 “learning tips” were developed: ideas for activities at school, organized according to the students’ age. All the tips are put in relation to the interviews, down to each specific couple “Q/A” within each interview. The idea is to help learners and teachers to go beyond the usual barriers:

- exploring various possible teaching/learning activities to carry on, in connection with Expo Milano 2015
- digging into various issues related to Expo Milano 2015, selecting (possibly) unusual topics
- developing a novel and fresh approach

Eventually, the idea that all disciplines are relevant for Expo Milano 2015 was also conveyed: math teachers can have their students analyzes data about the environment, art teachers can explore how nutrition is represented in works of art, economy teachers can study the impact of packaging on the final price of products (and the environmental impact), etc. Tips therefore include a suggestion on which discipline may have a say on what topic.

Participating teachers are expected not only to discuss and remix the tips they are provided with, but to share their own with the community of their peers within the MOOCs (Massive Online Open Courses) that were designed to support them and that will be described in the next paragraph.

Moocs For Teachers

In order to foster a deep understanding of the Expo issues and to create a community of teachers around them, three MOOCs were designed and deployed. The first one, Digital Storytelling at School, offers an overview of the use of digital storytelling in educational contexts, with special focus on PoliCulturaExpoMilano2015. It can be defined as an xMOOC, that is, a MOOC focused on knowledge transmission [Thompson, 2011; Siemens, 2012].

The second one, Expo Milano 2015 and Learning, represents a focused approach to the thematic categories of Expo Milano 2015, in view of the creation of effective learning activities. It is a cMOOC (connectivist MOOC – Crowley, 2013) where the role of the community is the key factor. During the MOOC, participants are asked to develop and possibly implement a meaningful educational activity on the Expo Milano 2015 issues, starting from interviews and the suggested educational tips. Participants are also expected to read and peer-review projects by colleagues. The community, supported by Google+, has the goal of encouraging the sharing of ideas and proposals: each participant expresses her/his views and explores the proposals by others. Comments allow approaching the various topics from different points of view. A further objective is to find other teachers (near or remote) who share similar interests and may want to cooperate.

The third one, PoliCulturaExpoMilano2015 is a pMOOC (project MOOC) for all the participants in the contest. The MOOC is the place devoted to constant tutoring, where participants can find mutual help or ask the staff when they are in trouble. Also in this case, we stressed the idea of an active community of teachers, where someone can find a colleague, facing similar problems, and where our staff can easily communicate with all participants, trying to help them.

Through its MOOCs, PoliCulturaExpoMilano2015 creates communities that provide opportunities for growth and encounters to every teacher. Teachers discuss with other teachers, virtually meet colleagues, organize remote collaboration projects. Communities are meeting points recommended to everyone:

- those with ideas and intuitions can find colleagues with whom to discuss and refine their plans;

- those who are confused and without ideas can find colleagues to help them, offering ideas and suggestions;
- the most experienced ones may help those with difficulties, in a context of peer education

All those who complete the activities required in each MOOC will receive, at the end of the course, a participation certificate and a digital badge (compliant with Mozilla international standards).

The Time-Bank

One of the most interesting discoveries we've made working with school teachers of all grades for about 15 years is that, in many cases, they lose time: for example, they may spend a lot of time trying to learn a specific computer program they think they might need than tackling the heart of the educational problem they are dealing with, or they may again spend more time retrieving information than shaping it for an educational activity. The Time-Bank seemed a good solution to optimize teachers' time, delegating the execution of repetitive but very time-demanding tasks to colleagues who are more in command of a specific skill, offering to reciprocate in a similar manner with other, more appropriate to one's own skills, tasks. This mechanism allows teachers to offer their time to perform operations that they can do very quickly and easily in exchange for the time of someone else. To realize this idea, which has never been applied to schools, we have partnered with TIMEREPUBLIK (<https://timerepublik.com/>). TIMEREPUBLIK is a global online community which allows users to exchange services, where the unit of currency is not money, but time. TIMEREPUBLIK allows its members to freely exchange services needed. Two users don't have to mutually swap services with each other. Instead, everyone can switch around, earning and spending units of time. A time bank can strengthen the community: teachers can exchange research and skills not only "giving away" their time, but receiving credits valid in the time bank: it is a way to create value and to ease the circulation of skills.

Evaluation

An array of tools has been prepared in order to test the impact of PoliCulturaExpoMilano2015, including:

- Surveys to teachers participating in the digital storytelling competition; one survey to be filled in before the activity, on the expectations, and one survey at the end, on the results. Surveys entail 30 questions on average that explore the acquisition of knowledge, skills, and – most important – attitudes towards the Exposition issues.
- Surveys to teachers participating in the MOOCs; again, one survey to be filled in before the activity, on the expectations, and one survey at the end, on the results. Surveys are again quite detailed and explore the dynamics of knowledge exchange and peer-to-peer learning among the communities of teachers within the MOOCs, with specific reference to the distributed TAPCK model (Di Blas et alii, 2014).
- Semi-structured interviews to participating teachers, partially following the roadmap of the interviews but leaving space for the surfacing of unexpected topics and anecdotes.
- Analysis of all the students' artifacts (i.e. the multimedia stories) by a panel of experts in educational technology, pedagogy and Expo issues.

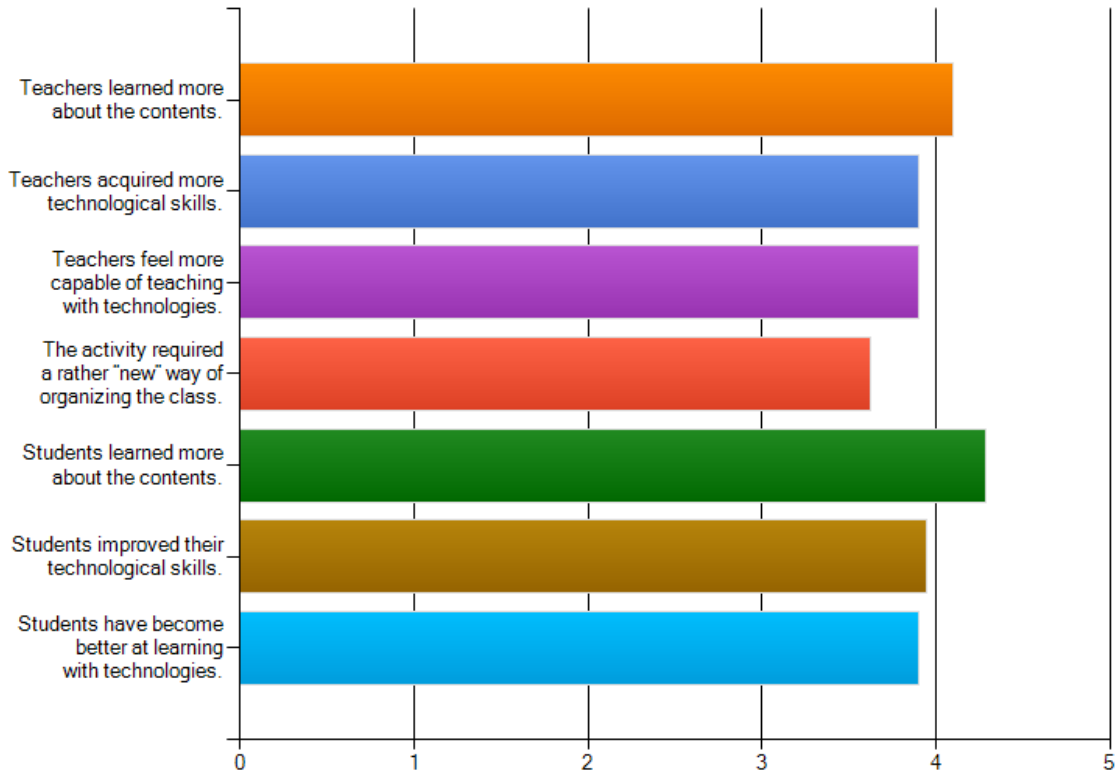
At the time of writing this paper, the competition is running and therefore all the above data are still to be gathered and analyzed. We present here some of the data from the pilot (2013-14).

83 classes from 9 countries (Austria, Belgium, Croatia, Greece, Italy, Latvia, Somalia, Spain, USA) participated to the pilot edition of PoliCulturaExpoMilano2015, in school year 2013-14. Due to lack of space, a selection of data is presented here. Scores were given according to a Likert scale from 1 to 5 where 5 always meant the most positive opinion.

First of all, teachers acknowledge significant benefits with respect to the acquisition of knowledge about the Exposition's issues (content), using technology in education (digital storytelling) and development of new pedagogical strategies. These benefits are acknowledged not only for the students, but for the teachers themselves, as a form of professional development.

Figure 2. Development of knowledge in content, pedagogy and technology through PoliCulturaExpo2015; 83 teachers respondents, scale from 1 to 5 (where 5 is best).

Please rate your agreement with the following statements about what teachers know AFTER the conclusion of the PoliCultura activity.



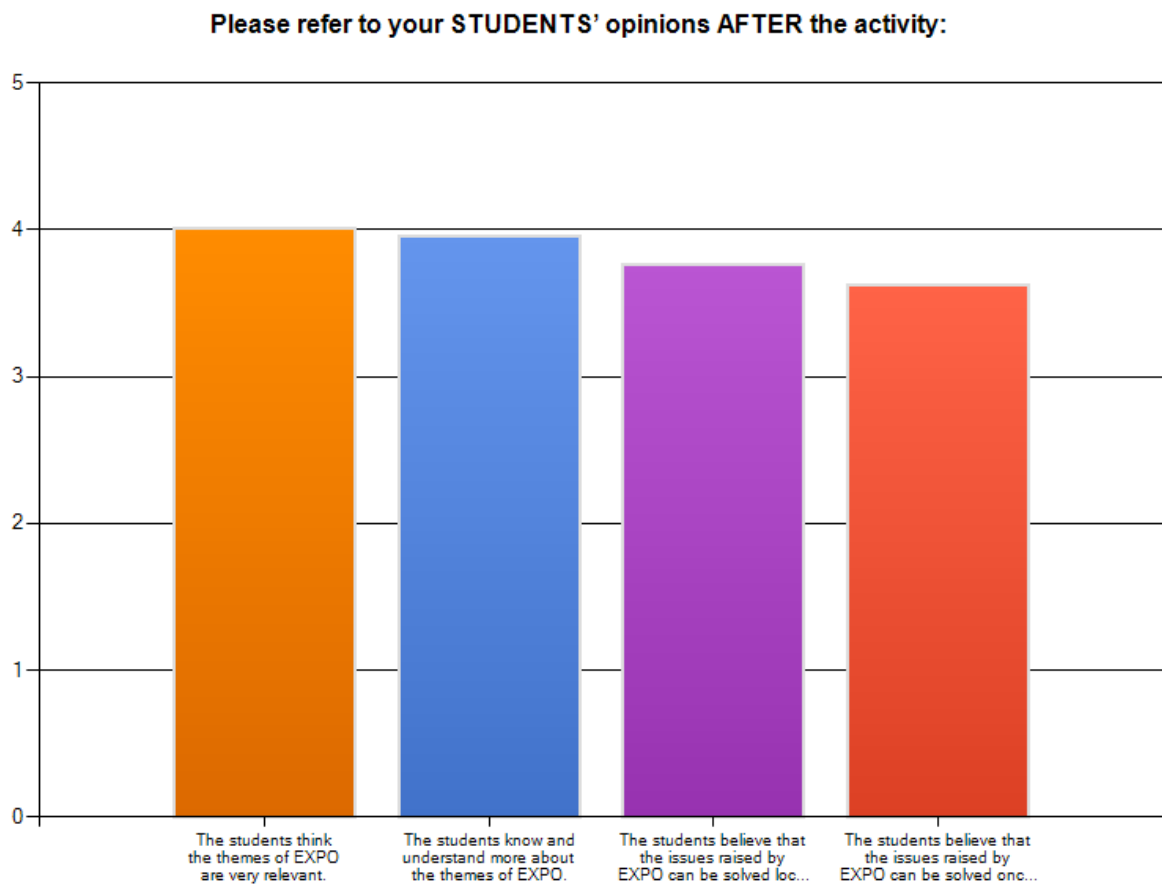
Teachers acknowledged also a significant increase in motivation (63,7% scored “motivation” 4, 23,8% scored it 5), enhanced curiosity towards the subject (47,6% scored “curiosity towards the subject” 4, 42,9% scored it 5) and development of accountability and professional skills (61,9% scored “accountability and professional skills” 4, 23,8% scored it 5).

Group work was seen as the characterizing aspect of the experience, supporting students into achieving better results (52,4% rate it 4, 23,8% rate it 5), increasing motivation (100% rate it either 4 or 5) and creating lasting bonds among the students (100% rate it either 4 or 5).

The overall evaluation was positive: teachers “agreed” (score 4) and 28,6% of the teachers “completely agreed” (score 5) that the activity had been very effective in terms of learning; they also acknowledged that it had contributed to their professional development (38,1% score 4, 23,8% score 5).

The most important data in relation to this paper are those about the attitude change towards the Exposition themes: teachers acknowledge an enhanced understanding, in their students, of the relevance of the Exposition’s themes.

Figure 3. Change of attitude towards the Expo Milano 2015 issues; 83 teachers respondents, scale from 1 to 5 (where 5 is best). Second and third column full text “The students believe that the issues raised by Expo can be solved locally, with help from all of us” and “The students believe that the issues raised by EXPO can be solved once and for all only with a global approach.”



Conclusions

Organizing a world-education experience, based on technology and a common subject, is not easy and several obstacles can litter the path. In the following, we can list some of the more compelling lessons learned:

Reaching Out to Schools

Being able to “deliver a message” to schools worldwide is a difficult task. Only a (very) small percentage of teachers (of the world) are really online and in the confusion of the Internet it is very difficult to make a message visible.

Schools and teachers trust their own authority (district, region, ministry... depending on the countries): so going through educational authorities is the best way to reach them. But it takes time, which in the case of schools means years, not just months. On the other hand, establishing good relationships with school authorities, at all levels, is the best way to ensure a real in-depth impact on the school systems over time. Authorities can in fact help in transforming a one-time-effort (typical of research-based project) into a more sustainable impact lasting at least a few years.

Motivating Schools and School Authorities

The organizers of a Universal Exposition have a major goal: to attract millions of visitors, with roughly 10% of them from schools. But why schools and teachers should be interested at working at a common subject, related to the Universal Exposition? Schools and teachers have a strict agenda (given by their authorities and/or by national or international standards) about what they need to achieve: they can perceive any additional offer as a distraction from their mission.

Different “key messages” can help in motivating authorities, schools and teachers, like for example: the subject is relevant on its own, for world citizenship; a world educational experience is unique on its own; technology-supported education is relevant on its own; this kind of experience is an occasion for professional development for teachers; it is also a motivating and challenging experience for pupils; being part of a Universal Exposition and contributing to the presence of one’s own country within a world activity is good; etc.

Relevance of the Subject (of the Universal Exposition)

Each Universal Exposition has its own agenda, which is very important for the city organizing the Exposition, but not necessarily on top of the educational agenda for schools, worldwide. So it takes time and effort (see below) in order to “sell” the subject to schools.

As the exposition approaches and, even more, while the exposition is going on, the attention of schools is drawn, but it's too late. We know that Expo Milano 2015, for example, will be very visible to teachers, worldwide, from May to September 2015; unfortunately this timing is not really suitable for an effective educational activity (and most schools in the northern hemisphere will be closed!).

So it is necessary to involve schools on the subject, starting at least three years before the exposition opens its gates: in this way, educational activities can be developed at a reasonable pace and in a more effective way; they also generate (in teachers, kids and students) a deep interest for the subject, and therefore for the upcoming Exposition.

In addition it makes sense to have schools working on the subject even after the exposition itself; as legacy of the event that can influence the school systems at least for a couple of years.

Pedagogical Value and School Organization

School years are organized with different scheduling in the Northern and Southern hemispheres; school systems of the same hemisphere have additional (much smaller) differences in scheduling. These practical problems need smart solutions, if teachers and pupils need to feel that they are working on a world educational experience.

Pedagogical approaches are different from country to country: the pedagogical value of the proposal should be common (worldwide), but also flexible enough to suit the taste of each different school system (and also of each teacher).

Educational Resources

The subject of a Universal Exposition is clearly not strictly related to a curriculum or a discipline. Many teachers find it difficult to grasp the potential of the subject, in relation to their disciplines. Even teachers of good will may feel not adequately prepared to discuss issues such as (taking the example of Expo Milano 2015) biodiversity, sustainability, nutrition,....

It is therefore crucial to prepare educational resources that teachers can use for their own sake or for teaching to their pupils. The goal is twofold: to build a bridge between the

overall subject (e.g. “feeding the planet”) and the various disciplines (from humanities to science, math, art, ...) and to provide material that teachers can actually use in their activity. Resources should include material to read, references to existing resources, and, very important, ideas about how to deal with the subject in class.

Training Teachers

Online training today is easier and cheaper than ever. It is important (practically and psychologically) to provide teachers not just with resources but also with explicit training. We had the confirmation that a good percentage of teachers like to be directly trained (in a flexible manner) about the subject and about what they have to do.

Communities

Part of the training consists in the creation of communities of teachers. Like for many MOOCs, we have experienced that only a small percentage of trainees are really active in the communities; still, communities play an important role in creating bonds among teachers of faraway locations.

In a long term perspective, creating communities of teachers across national boundaries (in a non-trivial sense) can be the “disruptive innovation” that schools need in all countries. At the same time, this may be an obstacle for acceptance by all countries.

Contributions by Teachers/Pupils

It is important that all the resources discovered and/or created by the various teachers and groups of students become part of the overall environment. There are at least two reasons for this: first of all, teachers and students can provide an interesting local perspective about a global issue: (e.g. pollution is a problem for the whole planet, but it has a specific, possibly illuminating flavor, in each specific area).

Secondly, allowing teachers and students to contribute helps to create the feeling of belonging to a shared society, where we all live. And this feeling can be important into building a “world citizenship” feeling.

Collaboration/Time-Bank

Actual collaboration among teachers is more difficult than it may be expected. Teachers seem to limit their exchanges with other teachers to content: i.e. identifying useful resources (documents, websites, ...). Still, over time, we believe that establishing cooperation among teachers on a planetary basis can help school systems to evolve in a positive way, especially for those teachers working in marginal difficult environments. This is why we had setup a Time-Bank for fostering mutual help that can run from practical aspects (e.g. translations or help in using a piece of SW) to deeper aspects (e.g. pedagogical approaches and solutions).

Visibility, Sharing, Competition, Awards

In the end we know that visibility of the results of the work done at schools represents a very strong motivation for teachers and students alike. This is why portals, You tube, web tv, ... are all important incentives for schools who did participate and can attract participation from other schools.

Competition among schools can be dangerous, since it can discourage participation from teachers and students who do not feel “up to the level” of the others participants: at the same time, competition has a strong attractiveness for motivated teachers, who in general are also strong motivators for their students. We think therefore that competitions (with finalists, winners, etc.) should be kept, still keeping in mind that the overall goal is good education, and not a mere award.

Creating a world school system could be the best way to build “world citizens”, but for the time being it is only a dream. Creating worldwide educational experiences across national boundaries, lasting a few years, with schools working at a common subject, can be a viable intermediate step. Universal Expositions offer the chance of a new, challenging subject, proposed to the world for 5 years.

PoliCulturaExpoMilano2015 has been created for the next Universal Exposition; we hope that the effort could be continued (and enhanced, from learned lessons) for the future.

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