Article

Future-Labs in the Classroom: The Experience of -skopìa

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Abstract

During the past three years, -skopìa[EDUCATION], the educational branch of the recently established start-up of the University of Trento, -skopìa, has conducted an extensive series of future laboratories in the classroom, working in particular with students aged twelve years old (second year of "medie inferiori") and fifteen years old (second year of "medie superiori"). Future labs follow an explicit protocol (initial and final tests, three major steps, respectively, focused on the past, the future and the present). Teachers wanting to conduct a lab in their classroom must attend a preliminary training course. Furthermore, all the labs are monitored by -skopìa.

Keywords

futures laboratories, educational system, training course, visions of the past, jump into the futuro, back to the present

Introduction

The future is a central aspect of education. Nonetheless, schools continue to be strongly past-oriented. Although many teachers struggle to help students think about their futures, teachers themselves are often unaware of both the theories and methods of Futures Studies and do not know how to conduct a Future Laboratory in their classroom. This article presents the Future Laboratories organized by -skopìa, a recently established start-up of the University of Trento, in both lower intermediate and high schools.

The Difference between "Future of" and "Future in"

As a first step it is useful to distinguish two different ways to use the future, which we label "future of" and "future in." The first case, "future of," usually includes technical exercises that require in-depth specific knowledge. If one is interested, say, in the future of mobility, one should collect information on what is happening in the automotive sector (from electric and flying cars to autonomous vehicles and drones). The future of the educational system is another example of "future of." How should the systems of primary and secondary education change in the coming decades? What are the active forces influencing their development? Some forces are already quite visible and indicate precise directions of development: demographic changes, changes in the labor market, or those of information technology. Other forces are less clear and allude to changes that may go in completely different

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directions, to wit, political and institutional changes. "Future of" exercises require specific technical skills as well as in-depth analysis of the markets or sectors of reference and the understanding of global megatrends.

The other case ("future in") is different. The expression "future in" refers to the structured introduction of future skills within an organization, institution or community. Here, one does not deal so much with extrapolating trends or constructing technical scenarios as with the capacity to actively use the future in the present, the skills necessary to "speak" the future. In this case, the basic competence is more cultural and attitudinal than technical, although obviously it cannot be separated from some technical elements. Sometimes in these cases we use the expression "futures literacy" (Miller 2006, 2007, 2011), a major component of the theory of anticipation (Poli 2017a, 2017b).

The capacity to read and write has allowed entire generations to develop their ideas. Teaching to read and write requires specialized personnel, and acquiring these skills also requires the ability to master technical elements (e.g., the grammar of one's own language), but it is basically a tool of freedom that allows people to orient themselves, develop ideas and personal visions, express and defend their dignity. In the same way, futures literacy requires the acquisition of some basic skills, but it is above all a tool of freedom that allows people to orient themselves, develop ideas and points of view, express themselves and defend their dignity.

Although the first type of future exercise ("future of") is a predominantly technical exercise, the second type of future exercise ("future in") is a predominantly formative one, and for this reason schools should be the ideal setting for its systematic introduction. Anyway, the difference between "future of" and "future in" should not be overstretched. As explained later, Labs include activities such as reading papers, watching movies, analysis of forecasts made by well-known people, and so on. These activities are all sources of knowledge and none of them is exclusively inchoate.

-skopìa has worked in both ways to organize training courses for school managers (the future of education) and training courses for teachers; the latter in particular are preparatory to the introduction of future laboratories (FutLabs) in the classroom (Poli 2017c).

Challenges for the Educational System

Before presenting our proposal, two further reflections are essential. We will be as brief as possible:

- Oncoming changes will be so deep and surprising that any primarily content-based or process-based reorganization of an educational system will fail. Any proposal claiming that what is needed is more mathematics or more language or more computer science or more history falls into this error. We are far from claiming that content competences are irrelevant; the issue is that in addition to more or less classical skills, students will also need entirely new ones. What we need are people able to stand, believe in themselves and their own ideas, able to read their environment, and build their sources of living. In one sentence, schools should aim at developing the character of their students
- This is especially relevant because, at least as far as Italy is concerned, teachers and the entire school structure will have increasingly to deal with the already visible reduction of parenting skills of many contemporary families (Camerini et al. 2011; Lavigueur et al. 2011; Sità 2005; Zambianchi 2012).

Any proposal of reconfiguration of the educational system will have to consider these issues, as well as others that we have not mentioned. As said, we claim that a new form of literacy—a literacy appropriate to the twenty-first century—is needed. The traditional forms of literacy obviously continue to remain fundamental—students must continue to learn to

read, write, and count, but these forms of literacy are no longer sufficient.

As we are living through a historical phase marked by increasing levels of uncertainty, the most efficient way to deal with rising levels of uncertainty is to realize that the lessons from the past are no longer sufficient and "learning from the future" should become a standard component of education.

Futures Laboratories in the Classroom

Operationally, futures literacy in schools can be introduced by organizing Fut-Labs in classrooms (Poli 2017c). The methodology and practice of future laboratories in the classroom has been developed by -skopìa, a start-up of the University of Trento, and has already been extensively tested both in lower secondary schools and high school. The first experiments have been conducted by one of the authors (Emanuelli, at that time a student of Poli) in 2014—even before the birth of -skopìa (established in 2015).

-skopìa[EDUCATION] has experimented with different types of future laboratories in the classroom. The basic Fut-Lab explores students' personal futures, but Fut-Labs have also been conducted on future professions and on the future of common goods (Bonesini et al. 2017; Poli 2017c; Scolozzi et al. 2017).

Here we limit ourselves to presenting the "standard" laboratory on personal futures. Fut-Labs can be conducted within any teaching course; they can be taught by one single teacher or be conducted as a shared activity by two or more teachers. An average Fut-Lab requires about fifteen hours, at a pace of about two hours per week. Time is major constraint: Fut-Lab will not work if conducted at either a too rapid or too slow a pace. Furthermore, teacher(s) conducting Fut-labs should have attended -skopìa's training course.

Fut-Labs can be tailored to the needs of middle (age eleven to thirteen) or high (age fourteen to eighteen) schools. Moreover, Fut-Labs are formulated differently according to the type of school (professional, technical, lyceum). As far as middle schools are concerned, Fut-Labs are conducted in the second year. We are presently developing protocols for repeating Fut-Labs year after year for the first four years of high schools (Tables 1–4).

Table 1. Courses for Teachers.

- Iprase, Trento, 2016 and 2017
- Istituto Comprensivo (IC) Cavalieri, Milan, 2016
- Tito Livio, Milan, 2017
- Spring school, Trento, 2017
- For about 90 trained teachers

Table 2. Contents of a Typical Training Course for Teachers.

- Introduction to futures studies
- The three levels of futures studies: forecast, foresight, and anticipation
- Social acceleration
- Phases of the Fut-Lab
- International experiences
- Exercise: Backcasting
- Exercise: the Delta of the Future

The Education group of -skopìa tailors together with the teacher his or her own lab and monitors its development. If needed, we advise teachers, and support them if something goes wrong. After the conclusion of a Fut-Lab, we prepare a report on the activities and impact of the Lab on the mind frames of the students.

This article presents only the basic structure of our standard Fut-Lab, exploring personal futures.

Phases of a Fut-Lab

Fut-Labs are developed in three main phases, plus a test administered at the beginning of the laboratory and repeated at the end. The different answers provided by students show the effects of the Fut-Lab.

The three phases of a Fut-Lab help students to develop skills and abilities to see, think and analyze the future in a strategic way. The first phase is focused on understanding past and current changes; the second phase concerns subsets of possible futures; finally, the third phase returns to the present and uses what has been seen of the past and the future to develop an individual plan of action.

Table 3. Fut-Labs Conducted by -skopìa.

- 2014–2015
  - Borgo, high school, 17 students
- 2016–2017
  - Strigno, lower secondary school, 24 students
  - Cavedine, lower secondary school, 38 students
  - Milan, lower secondary school, 48 students
  - Tione, high school, 14 students
  - Trento and other cities, high school, project "Anticipare Future Professioni del Turismo di Montagna," 120 students
  - Trento and other cities, high school, project "Made in Future," 80 students
- 2017–2018
  - Strigno and Cavedine, lower secondary school, 43 students
  - Milan, lower secondary school, 48 students
  - Cembra, lower secondary school, 20 students
  - Borgo, lower secondary school, 24 students
  - Trento, high school, 24 students
  - Milan, lower secondary school, 152 students
  - Milan, high school, 60 students
  - Cavedine-Vezzano, lower secondary school, 40 students

Table 4. The Basic Structure of a Fut-Lab.

- Questionnaire (first administration)
- Visions in the past
- Jump into the future
- Back to the present
- Questionnaire (second administration)

Fut-Labs help the students to develop a richer, broader, and more aware vision of the future and the decisions they may have to take: anticipating changes allows them to be ready for new challenges, to recognize the possibilities and to develop projects and alternative plans if unforeseen circumstances and obstacles prevent them from achieving their objectives.

Each phase is characterized by dedicated exercises, readings, watching movies, and other activities. Teacher can choose the materials that are most suitable for the educational path of their class and its needs.

We now sketch the main phases of a Fut-Lab and the questionnaire.

Phase One: Visions in the Past

The main purpose of the first phase is to understand that changes are the norm. Understanding that changes are the norm helps lower the level of anxiety and opens the door to further, somewhat more relaxed, exchanges.

This phase includes both home and class activities. Among home activities, students may ask their parents and grandparents (or the persons who care for them) to talk to them about the time when they were of the same age as the students; the worries and the hopes that they had at that time and what they did to face them. Furthermore, students may collect and analyze family pictures, noting the differences from today.

The activities in the classroom include analysis and discussion of previous predictions, right and wrong; readings on teenagers at other times such as "Teens in time" (Coates 2004), watching predictive short movies on the near future. Then a questionnaire with multiple-choice questions and open questions is administered. This questionnaire helps the teacher better to understand the students' visions and their "dependence" on adults' fears and uncertainties.

A typical outcome from these activities is the wish to "prepare," "organize," and "plan" the future to avoid surprises.

Anyway, by understanding that changes are normal, that there have always been changes

and that people have learned to manage them, the anxiety level of students diminishes, and this opens the door to the second phase.

Phase Two: Jump into the Future

The second phase, Jump into the future, begins with a first step forward: the creation of a long-time line (long with respect to the age of the students). The teacher asks the students to indicate an "end" point—for example, fifteen years from now—and to set their professional, family, and personal goals (hobbies, sports, etc.) at that end point, also indicating the persons and intermediate events that would be part of their journey. High school students are also asked to include (and distinguish) probable future and preferable futures.

Students participate with great enthusiasm in this exercise and are very creative. Although the materials at hand are simple—newspaper clippings, magazines, images, and brief reflections on their objectives—the outcomes are often surprisingly rich and varied. Finally, students prepare a poster with as many details as possible on the objectives that they wish to achieve. There follows a presentation in the classroom, in which each student presents his or her objective, the choices and the steps she or he considers relevant and the images that best represent his or her choice. The teacher may evaluate the communication skills of the students and the clarity of their presentation.

Further classroom activities include readings and watching movies such as *The Giver–The World of Jonas, Tomorrowland, In time*, or *Matrix*. These activities are highly stimulating and allow students to comment freely on topics such as technology, the meaning of colors and human behavior.

The activities at home include a mini interview with a reference adult relative to the family's educational choices; this moment of sharing strengthens the active involvement of parents or other reference adults in the choices of the students.

Phase 3: Back to the Present

In the third phase, students return to the present. The material prepared for this phase derives from an adaptation of Verne Wheelwright's (2011) *Personal Future Workbook*. The drafting of key questions, albeit very simple, is treated with great care to allow students to carry out the various steps autonomously.

Students are then invited to respond to a structured series of questions about their future. Questions deal with profession, family, activity, health, and housing. Students are also asked to comment on the questions with short sentences and/or keywords. Subsequently, they are invited to rearticulate their ideas in a text, which the teacher can evaluate as a written essay, and to indicate the choices that they think they should make to achieve their goals.

The Questionnaire on Mental Maps: Comparing Initial and Final Administration

Future laboratories are preceded and followed by a questionnaire, asking the following questions:

- Let's move into the future . . .
- You wake up like every morning but . . . Today you are a thirty-year-old man/woman.
- You have a mirror in front of you, how are you?
- Now move your gaze on the objects around you: what do you see?
- Describe your workplace and your role.

The difference between the answers provided to the first administration of the questionnaire and those provided at the end of the laboratory makes it possible to gauge the effects of the laboratory.

There are major differences between initial and final answers. Answers to the first administration of the questionnaire are typically highly stereotypical. Final answers are instead highly personal. For a report from several laboratories see (Emanuelli 2017, 2018). Table 5 below provides some representative answers.

The students' answers to the questionnaire give us a clue about whether the Lab has been successful. The objective is to gauge the transformations of their mental maps, to see how their perception of the future has changed and

Table 5. Selected Answers to the Questionnaire.

First administration	Second administration
A little higher, robust, with a face a bit tired because of the job and half bald, with responsibility because of the family and therefore more mature and confident of myself. Now I'm dressed in jeans and a shirt, ready to go to work.	Now I am over 30 years old; I am a little taller and more robust, unfailingly sociable and friendly to everyone and ready to help others: the person of a few years ago, with some more experience and less crickets in the head.
I see a nice and comfortable sofa, 60-inch LED TV with Dolby surround system, a room full of memories from my childhood and adolescence, like photos and toys, and a robot-shaped vacuum cleaner that does the cleaning.	I get up in the morning, as always; I live with a girl for a few years now, and we are getting married. We live in a simple house in a small town in the area. I'm dressed in comfortable sports clothes, ready for work.
I work for a company in the area, in the warehouse department: it is a large warehouse, with machines that sort the goods, opening the packaging and using a mechanical arm the machines bring the goods on conveyor belts that transfer them to the designated place. Obviously there is a machine for each product. I start working in the morning at 6:00 a.m. until 10:00 a.m., then a short break of half an hour, and then we proceed until 13:30 when we go for lunch. I start again at 2:30 p.m. until 5:00 p.m.; Saturday and Sunday are free, while on Fridays I work only half a day.	Around me I see many children and young people, with a great desire to learn: my dream came true: I managed to open the dance gym that I always wanted after so many, many sacrifices. I worked as a salesman, storekeeper, handyman, with interim contracts, provisional agencies, through ads and word of mouth, to put aside the necessary money, and even with a little luck I also found funding to complete my idea.

how now, at the end of the Laboratory, they see themselves in the future, in the light of the skills and anticipatory abilities matured during these months.

The focus of our analysis is the difference in the production of miniscenarios between the beginning and the end of the Lab: essentially, in the first phase the great majority of students see and describe a kind of futuristic and hypertechnological landscape, providing only generic information about their physical and emotional being.

The answers to the latter administration of the questionnaire show that students have become the main character of the scenarios they describe. Furthermore, most students add information about their feelings, the objects representing an adult and successful professional life, and they show a clearer idea of their job position and working relationships.

Writing in the present tense becomes preponderant, and in most cases B-plans become positive alternatives to the previously described visions: as a matter of fact, this is our goal, namely, to help students developing the capacity to be flexible and to imagine different possibilities.

Further Observations

The following additional observations are relevant:

- Laboratories are carried out only by teachers who have attended appropriate training courses; working with the future is neither simple nor obvious and requires adequate training. The issue of the future is emotionally charged. If it is not managed appropriately, it can produce dysfunctional results, as well known by those who have naively asked students to present their ideas for the future without having set an appropriate context.

- Laboratories are monitored; the novelty of the proposal may cause problems even for experienced teachers otherwise wishing to conduct a Fut-Lab. This is why it is important to monitor the performance of the laboratories and provide teachers with constant tutoring for the entire duration of the laboratories.
- At the end of each Fut-Lab a report is written. It states the results obtained and analyses the problems that may have emerged. The Lab's final report analyses the entire Lab, whether (or to which degree) students have taken part in its activities, the documents they have produced, the changes in the language and images used for referring to the future. These reports are delivered to both teachers and principals.

Finally, the following excerpts from the feedbacks received from students and teachers helps to better understand the impact of our Fut-Labs (Emanuelli 2017).

Feedback from students:

- This project, in my opinion, is very useful, both for us pupils and for teachers: it makes us understand how life can be and that the future is not necessarily negative as many people say, and as we often think . . . The project made it clear that we will not always be able to realize all our dreams, but this is not necessarily a negative factor: it may be that something happens that we did not even imagine and that we like it more than the dream or goal we initially had. It made me raise my maturity level . . . Many things have to be learned; one has to work hard to reach his goal, and if it does not come true, do not give up but persevere. All teachers should be trained in this field . . . we do not need culture in its own right, we must learn to use it, how to face the difficulties of life and overcome them intelligently.
- In my opinion, the project was very nice and fun, it made me think a lot, opened my eyes on my future and helped me understand how many opportunities I can have and the many choices I can make . . . For me it was a perfect project, it helped me to understand that there are so many possibilities and that if a dream does not come true, well, you can do something else and like it! I would make it last longer and on more subjects, for me as well as two hours a day (out of the seven we have), and for all the years of school, so at the end of each path you can see the changes and monitor the growth of people.

Feedback from teachers

- The project has had considerable success because students are not used to reflect on their professional future . . . it was a very good experience to learn how to develop strategies to adapt to situations that one may have to face in the future.
- An opportunity for the students to reflect on topics that some had never taken into consideration and that they would have never done it without a guide; we tried to involve the kids by stimulating them with different activities that made the project dynamic and avant-garde; it was understood how important it is for teenagers to work on the present and understand who they are in order to be able to realistically combine dreams and expectations typical of their age with the resources they have.

Last but not least, a totally unexpected discovery for some of us has been the deeply positive effect that future laboratories have had on children with special educational needs. From what we can see, at least in some cases and perhaps for the first time in their lives, these students have felt themselves in charge of their lives.

Conclusion

The Fut-Labs conducted with middle and high school students under the supervision of

-skopìa[EDUCATION] show that the structured introduction of elements of the future in the classroom allows the students to develop their ability to see a wider spectrum of possible personal futures, helping them to improve their capacity to aspire to a better life.

Furthermore, teachers benefit from a new kind of teaching supported by dedicated training, framed by an explicit setting of the Lab, and followed by subsequent monitoring.

Principals and families should be involved as well, addressing their worries and developing together with them strategies that may help transform education from a problem into a resource. Although we do not have space here to present our programs for principals and families, both are part and parcel of our overall strategy.

Future-Labs are just one component of educational Futures Literacy. This article shows that concrete proposals are already underway, that they have already been operationalized and tested in different contexts and with different types of schools. Of course, much remains to be done, but at least there is no need to start from scratch.

Finally, the main issue is understanding that the traditional forms of literacy—however important they have been—are no longer sufficient to face the complexity and the uncertainty of the contemporary world. Futures literacy and an explicit focus on anticipation can help to develop the capacity to aspire (Poli 2017b, 2018).

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