



## Almost Web 3.0: an Experimentation project for Middle School

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### Abstract

*In this paper we present and evaluate a new learning environment model based on Web 3.0 approach.*

*Creativity is the most important feature of human beings, but nowadays we face a paradox: our students deal with a dramatic impoverishment of their creativity although they face a lot of technologic tools.*

*School is going to become a place where knowledge could be wasted instead of being communicated: 'teaching' is reduced to 'collect information'. Sense and language are not going in the same direction. We have words, but we are not able to communicate with them; moreover teachers and students do not share the same language while working together.*

*Learning environment reflect – according to McLuhan – the technological means of each age, but still 2.0 e-learning is rare in Italian school.*

*In our study, technological and web strategies are used to write and share digital texts, by creating a multi-input environment where knowledge becomes stratified, complex and stable. Information is categorized into a coherent structure, by creation of a database of inputs semantically connected: students organize knowledge – by some specific 'tagging' of each thought – and thus communicate it. Knowledge is thus reinforced.*

*Teachers and students share the same language, they create texts and experiment new linguistic registers: digital artifacts were aggregated, configured and manipulated. The quality of contents was improved, and students assessed the meaning of their learning. Communication itself became more and more coherent.*

*Our experimentation thus suggests a new strategy that could improve the 'classical' editorial digital proposals used in Italian school. Teachers are clearly 'visible' in this environment (in order to contrast the lack of authoritative critique in our schools): they deliver resources, make contributions and suggestions, and above all they offer a clear judgement on knowledge objects they communicate.*

### 1.Introduction.

Jules-Henri Poincaré was undoubtedly one of the mathematicians more involved in analysis of the 'creative skill' origin in men of science. "Invention is discernment" he said [1]; in this way he wanted to highlight the dual root of 'creation'. In fact we build up some kind of uncommon work only when we become able to place side by side a) the capability of joining together remote elements and b) the faculty to select among all the available elements. But nowadays we are facing a paradox: even if the formal reading of creativity is true (and even though the role of education should be the encouragement of creativity), our school is dramatically turning into an unfruitful place, where a simple collection of informations is frequently required. OCSE-PISA data analysis support this interpretation. Sir Ken Robinson in 2003 already stated such a paradox in his well-known TED speech: "Schools kill creativity" [2]. The above paradox is even more relevant if we consider the clear evidence that our age is – or it should be – a highly 'technological age'. Teachers are supported with a lot of new digital publishing tools, but what we often see in these devices is the lack of focusing our attention on sense



achieving. Using McLuhan approach [3], we can state that most of the current schoolbooks aren't regular 'text' at all: they have to become metaphors of reality. Meaning is achieved – as Poincaré said – by creating a complex structure in which different details are connected to each other. Such a complex object – full of sense, heavy in its semantic structure – must be always described as a text, namely as a stratified building in which a 'story of links' can be found inside. Modern students, ie digital native students, are not regrettably able to find an argumentative thread among all the specific notions they meet. Moreover, if it's true that there is no 'innocent' support [4,5] among the oral/written/typographic/digital ways of communication, it's even more true that nature of text is modified by a digital support. In particular, it was reported [6] that web communication interestingly resolves in a backwards orality, in contrast with self withdrawal carried out by writing.

## 2. E-learning environments.

A class of middle school students at first year was selected as target for the following experimentation. Web-based environments which are later on discussed were used for mathematics and science lessons, either during classroom lectures either for homework composition.

### 2.1 The reference class website.

Our e-learning environment proceed from a website specifically designed, [Lo stupore conosce](http://lostuporeconosce.scuolasancarlo.it) (URL <http://lostuporeconosce.scuolasancarlo.it>), which is used by students as a landmark in their travel through data collection and processing. Primarily, students make use of this site when they daily download pdf documents of all the lessons written – during classroom lectures - on the multimedia interactive whiteboard. In addition, they get used day by day scrolling among news and videos inserted by teacher, referred to specific topics in science and mathematics. Added documents are marked as 'Lessons' or 'Texts', the last being close examinations originally created by teacher (under a Creative Commons License 2.5), inspired by lessons content.

### 2.2 The teacher personal website.

In addition to class website, where lessons record was invariably and accurately set, students occasionally attend to an even more unsticky environment: [Sono al mondo per stupirmi](http://conosci.com/joomla) (URL <http://conosci.com/joomla>). This is the personal website of the science-math teacher, designed in order to convey the evidence that knowledge is only achieved by an amazed look on reality, conceived either as a bulk object either as a profusion of details. In this site, students come across different 'web places': a) videos produced in an original way (based on topics such as 'shape and life', 'evolution and development', 'the origins'); b) the teacher aNobii shelf (in order to show how knowledge is gained by a close attendance to tradition and literature); c) games and simulations; d) documents relating to special events (science festivals, conferences).

### 2.3 Blogger.

[Tre al quadrato](http://trealquadrato.blogspot.com) (URL <http://trealquadrato.blogspot.com>) is the Blogger-based weblog specifically build with students in a following step, around six months after the beginning of the project. The aim of using a web device like a blog – in addition to the website formerly described – is to lead students to develop an early and original text. The opportunity given by embedding images and/or videos in a plain text written by students themselves is a great chance to start assessing knowledge as a complex building that is based upon knots among single thoughts. Students are always the actual protagonists of this science-math blog: by a remote working, as in classical homework composition, they seek details related to a specific issue and they initially learn to put them together in a sole text.

### 2.4 Writeboard.

Writeboard software (URL <http://www.writeboard.com>) is used to initiate some sharable text documents starting from particular notions and/or experimentations that students meet during classroom lessons. Students are invited to write alone the notes they had took while listening to teacher lessons; each student actually adds his own input, and at the same time he collaborates with his schoolmates. On the other hand, with the same web-based tool, teacher can compare all the following versions entered by the students and thus monitor the individual degree of reached



expertise. Writeboard texts are easy-to-write, even if they unfortunately display rather basic features. In fact, this web application does not allow complex formatting codes, neither it affords images or video embedded in regular text. Anyway, it is a suitable and proper environment to approach young students to shared writing.

### 3. Results.

To sum up, the concurrent utilization of various web applications led the students to enlarge the standard of their communication to the different registers selected by the different softwares, in addition to the 'normal' scholastic register - ie the oral communication one - which is typical of classroom lessons. This was an interesting skill they demonstrate quite immediately, after the ability in using class website was attained. Students learned how to watch videos related to the different thoughts found on scooltext or by listening to teacher's speeches (Fig. 1 and 2), they also learned to tackle some arithmetical problems (Fig. 3) and to comment in a critical way the notes inserted by teacher (Fig. 4).

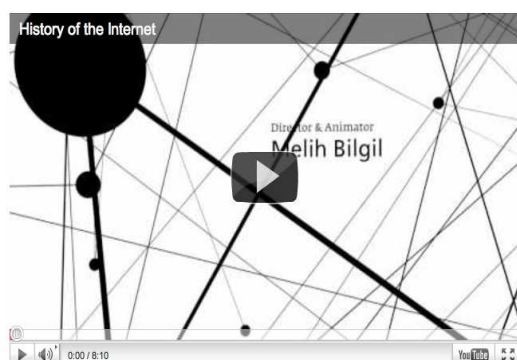


Fig. 1, 2 Use of class website (knowledge deepening)

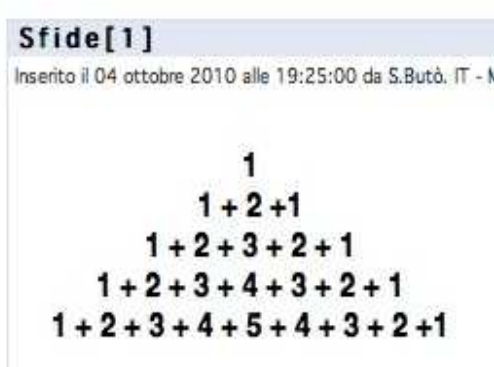


Fig. 3, 4 The evident presence of the teacher (students face a challenge and comment)

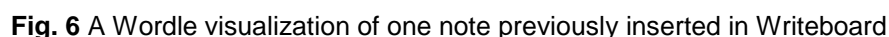
How could we demonstrate the student ability to change registers? Firstly, students didn't show any kind of linguistic redundancy. They inserted in 'Tre al quadrato' blog only small texts, while longer ones were given in all the classical tests carried out during classroom lessons. Secondly, these concise texts were absolutely not a replication of the notes they had put in Writeboard, even when both were referred to the same topics (eg 'the water surface tension'). Frequently, (as in Fig.5) the same student - at the same time - used both the applications (both the registers!) to communicate the single topic he selected; it's clear that his wish was to communicate the object 'entirely', both by using words and by presenting images and/or videos.





Students used Writeboard to 'save' in some way the oral communication which occurred during the teacher presentation of the topic and the following class discussion, by the insertion of the original notes they wrote. Moreover, such a kind of remote-and-concurrent writing shared among all the schoolmates led students to: a) a showing off of their respective talents; b) an embryonic criticism, because each student could compare his text with all the other inserted texts. Both Blogger and Writeboard environments therefore boosted the achievement of a sense of belonging among the students, but mainly they enhance the arousing of an effective text.

Since comprehension of a text implies the ability in recognizing its keywords, in Blogger posts students often decided (as in Fig. 6) to adopt the Wordle register (Wordle is a web application which, in a very simple and immediate way, creates words clouds with a thickness depending on word frequency in the text).



The most interesting evidence of our investigation is that the 'future of education' has to be achieved by some sort of looking at the past. Richard Feynman (the physicist whose lessons at Caltech called hundred of students fascinated by his ability in teaching) wrote: "People like learning, at any time of



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life" [8]. Even in our age, in which devotion to duty is more and more reduced, young students are still captivated by reality if their teachers are in turn captivated by reality. A teacher who is strongly caught up in 'things' is, above all, a person who can get to the bottom of the matter and who later comes back in surface, able to explain – with different registers - what he learned. Fascination towards reality, and thus knowledge, is expressed by creation of texts, namely complex objects able to weave a texture using different details, thus able to plot the 'everything story'. In our opinion, texts are human creations which testify and certify reality, and which highlight its value. Furthermore they come as evidence of authority, they are traces of an amazing gaze on reality. The skill in creating a text is due to the ability of picking up the argumentative thread (which always exists) from a wide range of details. Concrete knowledge is based on such an ability, and the creation of the argumentative thread is what distinguishes knowledge from common information. Since what we ask to our students is they effectively know, and not they are simply informed on reality, why don't we demonstrate – at any time and at any rate – that knowledge has to be passed on to each other?

The e-learning environment we proposed and discussed in the present paper was designed in order to help middle school students to assess and reinforce their knowledge, providing them alternative devices (most of them as web-based applications) by which details could be integrated and completed each other. Information stage was then overcome and students finally managed to a total commitment towards reality and knowledge.

## 5. References.

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