

2003). Moreover, they facilitate the creation of virtual communities (Garza, 2002).

The link among multimedia, metacognition, cognitive processes and “conversational” communication seems therefore able to promote reciprocal cognitive advantages. To better explore such a link, four experimental studies on virtual communication by means of blogs has been designed.

We choose to use blogs since they appear to be a suitable tool to work on multimedia and social aspects. Actually, a blog is a website in which items are posted on a regular basis and displayed in reverse chronological order. It comprises texts, images and links (to other web pages and to video, audio and other files). Moreover, blogs are based on a conversational style of documentation and therefore appear to be an appropriate modality to investigate the link between multimedia communication and metacognition from a “social-cooperative” perspective.

The general aim of this contribution is to illustrate the results of these researches and to discuss possible implications and critical issues of our findings.

2. AIMS

The first study was aimed at exploring bloggers’ cognitive characteristics and spontaneous strategic use of multimedia tools (Antonietti, Colombo & Sala, 2008). The second study was aimed at exploring the role of a blog in promoting metacognitive awareness (Sala, Colombo & Antonietti, 2006), while studies three (Colombo & Mugavero, 2010) and four (Antonietti, Colombo & Sala, 2008) introduced the effect of on-line cooperative learning.

More in details, in **Study 1 (S1)**, the main aim was to explore the link between individuals’ cognitive styles and the spontaneous use of blogs. The specific structure of blogs that combines text, images, and links to other web pages, allows to hypothesise a direct connection between the blog contents and the blog owner’s cognitive style. Such a connection would be useful especially to take advantages of social aspects linked to cognitive style (Riechmann & Grasha, 1982), and for the possible use of blogs in educational context. Moreover, such a link would allow teachers

and educators to use blogs not only to promote social skills among students and between students and teachers, but also too work metacognitively on cognitive styles, in an ecological context.

Starting from the relevant information given by the first study, in **Study 2 (S2)** we focused on possible ways to improve a more cognitive oriented use of blog, intending this as a way of promoting the benefits that this narrative and social environment may have on self regulation learning. To better highlight specific characteristics that could suggest to prefer blog to other web 2.0 environments, in this study different in-line environments were compared.

Following this line of research related to empowerment, the aim of **Study 3 (S3)** was to investigate the influence of online narrative environment on the cooperative construction of novels by primary school children. The study had three main goals: 1) analyse if narrative online environment building is related with metacognitive skills development; 2) assess metacognitive competence and try to improve it; 3) verify if on line cooperative learning promote metacognition.

The first three studies highlighted how the role of cooperation and self-regulated learning in multimedia environments, especially blogs, required more investigation. Hence, in **Study 4 (S4)** we try to explore if and how blogs could promote metacognitive awareness and foster more effective problem solving strategies in adults working in non formal learning setting. We hypothesised that blog should not only promote more metacognitive awareness and control (and hence more adequate strategies) but also more cooperation among participants. In addition, we also hypothesised that mystery stories written using cooperative strategies (promoted by using blogs) should be better than the ones written in less cooperative environments.

Given these general outlines, and trying to draw a general picture of our research path, we can see how, starting from a perspective focused purely on assessment the assessment of cognitive skills and spontaneous strategic use of those skill in an ecological environment (spontaneous blog building and everyday running), we moved towards a more integrated approach. In the second branch of studies,

starting from the lack of metacognitive awareness highlighted in our first investigation, we added some independent variables (see below for details) in order to assess the better way to use blog to promote metacognition and self regulated learning in young and adults users.

Our independent variables were:

- Use of technologies (presence vs. absence and/or different kind of web 2.0 environments)
- Narrative thinking (presence vs. absence).

While our depend variables were: level of metacognitive awareness and control; Efficacy of SRL; Level of cooperation (study 3 and 4).

We also explored differences among using blogs in formal and informal learning environments.

Different aims are summarised in Table 1.

Study	General Aim	Cognition	Metacognition (SRL)
S1	Assessment	Cognitive Coherence (internal/ between blog and owner)	Metacognitive awareness
S2	Empowerment	Differences among technologies	Promote teacher/students metacognitive skills
S3	Assessment & Empowerment	Influence of blogging on cooperative and language skills	Promote students' MC awareness
S4	Empowerment	Differences among distinct technologies Different form of online cooperation	Promote metacognitive skills

Table 1. *Aims of the four studies, with links to cognitive and metacognitive aspects*

3. METHOD

3.1 A general overview

The four studies had several aspect in common: the were all aimed at exploring relationship between blogs' characteristics and different aspects of self regulated learning. Yet, they

differed for samples typologies and learning sets (see Table 2 for a general overview).

Study	Typology	Details	Learning set
S1	Adults	50 blog owners	Informal
S2	Adults (teachers) + Children	31 kindergarten teachers + pupils	Formal
S3	Children	57 primary school students (7-9 yrs, exp) +56 primary school students (7-9 yrs, control)	Formal

Table 2. *A general overview of samples and learning sets of the four described studies*

More difference can be found in specific experimental designs, which will be described in next paragraph.

3.2 Studies' details

In **Study 1** 50 Italian blogs were analysed. Such blogs were divided according to 5 content categories: personally diary, commentary, amusement, political, specific topic (such as cooking, photography, music and so on). The five categories were balanced. Authors were contacted and asked for permission of analysing their blog and asked for their availability to fill in a short questionnaire. Simultaneously, the SOLAT (Torrance, 1978) questionnaire was put on line to assesses participants cognitive style (right vs. left), in order to be able to match people cognitive style with the "style" of their blog. Participants were also asked more general questions about how they designed their blog, what they like best and what they would change about it, their aims in writing a blog, and so on. Such questions were aimed to explore metacognitive awareness.

Data from questionnaires had been matched with blogs' analyses. Blogs have been analysed according to different variables: use of images (e.g. number of images, images typology, according to Mayer (1993) classification – Decorative, Representative, Organizational,

Explanative); relationship between text and images; posts' content; main emotion communicated by the post; self-indicators.

With **Study 2** we moved toward an empowerment perspective. Participants (kindergarten and primary school teachers and undergraduates) were divided into four experimental groups characterised by different forms of communication and different levels of multimedia use - paper communication (PC), computer communication (CC), email communication (EC) and blog communication (BC).

Participants were tested to assess the level of their metacognitive competences, in order to form homogeneous sub-groups. No differences appeared from this pre-analysis, therefore the participants were assigned randomly to the four experimental groups and then were asked to plan a computer based activity to be developed with their pupils. The PC group wrote the narration in a pen and paper modality. The CC group was asked to write it on a computer (using a word editor and being free to use multimedia objects, like clip arts or pictures). The EC group was asked to write their narration as e-mails and to send them to people of the same group. They were free to answer or not to answer to other mails, and to add multimedia features to their messages. For the BC group a on-line blog where they could write their narration was created and participants were instructed on the instruments facilities. A fifth group served as control group, not being involved in any form of narration, but only attending to the pre- and post-test. Each sub-group had to write down a report of the activity, using the particular medium of his own group and according to three phases: Planning (aims, steps, materials...), Performance (the actual evolution) and Conclusions (assessment, discussion, perspective).

All the written texts produced by the four experimental groups were collected and analysed according to the following three main criteria:

1. Mental verbs: number of mental verbs, which reveal the level and the quality of reflexivity and metacognitive competence, used by teachers and by children.
2. Language use: the style of communication, referring to content, medium, social/emotional context, used by the sub-groups
3. Metacognitive strategies: number and typologies of strategies used by teachers and by children.

To ensure the homogeneity of the examined contributions, and given different length of the teachers' writings, the mental verbs used in the first two pages of the three research steps for each sub-group have been computed.

In **Study 3**, our sample was composed by 113 children (age 7-9 years), equally divided into experimental and control group. Experimental group was asked to create a narration in collaboration with children of other schools, by using a shared blog; control group wrote a similar narration, without using an online environment. Both groups basically had the same assignment and worked cooperatively.

To facilitate the production of the narration, it was decided to divide it into four step (beginning, crisis, development, solution). In the experimental group, each phase was, in turn, initiated by a class, continued in the second and finished the last one. Productive work, in addition, was always accompanied by a metacognitive activity during which students were asked to answer a series of reflective questions related to their work. The same metacognitive prompts were proposed to the control group after each phase.

The operative part was preceded by a pre-test (Antonietti & Sala, in press) designed to assess the metacognitive competence (starting level), naive theories on cooperation and groups, and cooperative skills (baseline). The same test was repeated at the end of the project (post-test) to assess the effectiveness of the intervention. In detail, were used metacognitive self-assessment questionnaires and tests of cooperative work (through the composition of original drawings from a defined number of geometric shapes, and respecting the basic rules for group role management), with individual and group assessment.

Concerning the narrative task performed by pupils, we analysed the texts produced (the blog for the experimental group, and the narrations both for experimental and control group).

Concerning the blog, we evaluated the presence of self indicators (Bruner, 1998):

- Indicators of coping (action, commitment, resources, evaluation and consistency);
- Reflective indicators (quality, reflexivity, mental verbs);
- Indicators of social self (social referencing and location).

Concerning the narration, we considered the same self-indicators; in addition, we evaluated the narrative complexity, taking into account the length of the tale and the presence and type of morality indicators.

106 adults (mean age: 40.80 (SD=12.75); Male = 56%; Female = 46%) joined **Study 4**. They were randomly split into 4 experimental groups and asked to write a mystery based on given characters in fifteen days. They were given specific ties to turn a “simple” creative task in a problem solving task: they were asked to respect specific temporal bounds, use given characters, write an humoristic but realistic plot.

In order to examine the role of different kinds of virtual environment and forms of communication on metacognitive awareness and problem solving strategies use we created the four specific following subgroups:

- Blog Group, asked to solve the problem cooperatively on a blog devised for the research;
- Forum Group, asked to solve the problem cooperatively using a web forum (without the narrative and multimedia aspects which are peculiar of blogs);
- Mail Group, asked to solve the problem cooperatively exchanging mails through a mailing list;
- Control Group, asked to solve the problem individually and send the solution to the researchers by mail.

Before and after the task participants were asked to fill in the Metacognitive Awareness Inventory (Schraw & Dennison, 1994) and then, after writing the mystery, they were also invited to rate their work considering both their cognitive and practical performance. They both rated different aspects of their performance on a 5 point scale and answered to open questions. Meanwhile, mystery stories were rated from 5 external judges (adults with BA degree in different majors, fond of mistery stories) on 5

dimensions (humor, coherence, skilfulness, originality, overall evaluation) on a seven-point scale. Participants’ interactions (in the three experimental groups) were analysed according to Metacognitive and strategic aspects, such as anticipation, planning, monitoring, decision making, use of strategies, and Cooperative aspects, relating to questions, suggestions, answers, proposal acceptances, agreement/disagreement, aim interdependence, task interdependence, role interdependence, socio-emotional interdependence.

3.2 Instruments and Data Analysis

Trying to summarize the research path traced by the four experimental studies we can highlight a common focus on blog analysis, and differences concerning specific aspects on which each study concentrated. As can be noticed in Table 3 – different studies addressed different variables linked to cognition, metacognition and cooperation. Those aspects will be addressed specifically in results section.

Study	Method (general)	Focus on...	Instruments
S1	Blog (content) analysis	Cognition (content, use of image) Emotion (content) Metacognition (Self indicators, coherence)	SOLAT Metacognitive interview
S2	Blog (content) analysis	Cognition (language) Metacognitive (mental verbs, strategies)	
S3	Blog (content) analysis + Product analysis	Cognition (product quality) Metacognition (Self indicators, awareness)	Cooperative Assessment (Pre-Post)
S4	Blog (content) analysis + Product analysis	Cognition (product efficacy) Metacognition (Self indicators, awareness) Cooperation (Indicators)	MAI Metacognitive Interview

Table 3. *General overview of the four studies’ methods and focuses.*

Data has been analysed using both qualitative and quantitative methods, as summarised in Table 4.

Study	Qualitative	Quantitative
S1	Text analysis	ANOVA Cross Tabulation
S2	Text analysis	Cross Tabulation
S3	Text analysis Content analysis	Paired sample t-test Cross Tabulation
S4	Text analysis Content analysis	ANOVA MANOVA Cross Tabulation

Table 4. *General overview of data analysis methods*

4. RESULTS

4.1 Cognition

In **Study 1**, it was possible to highlight a general coherence in the use of cognitive aspects – linked to the use of multimedia elements and language use according to different topics. Also the emotional content of different posts was coherent with declared aims of the different blogs.

More in details, a first difference emerged in the use of Decorative images ($F(4, 42) = 3.00$, $p < .05$) among the blog categories. Post Hoc Turkey-HSD showed a significant difference between Political and Amusement blog, where the latter used more Decorative images. As could be easily expected, strong differences emerged considering posts' content. More in details: Topic posts were more frequent among Topic blogs ($F(4, 42) = 21.02$, $p < .001$); Autobiographical posts were more frequent in Personal and Topic blogs ($F(4, 42) = 24.72$, $p < .001$); Commentary posts were more frequent in Political and Commentary blogs ($F(4, 42) = 10.05$, $p < .001$). Reflective posts were more common in Political blogs than in

Personal, Topic or Amusement Blogs ($F(4, 42) = 4.59$, $p < .001$); Amusement posts were more common in Amusement blogs than in other blogs ($F(4, 42) = 3.82$, $p < .001$). Different blog categories appeared also to communicate different emotions. Positive emotions (such as joy or happiness) were more present in personal, Amusement and Commentary blogs ($F(4, 42) = 18.71$, $p < .001$). Sadness and delusion were more present in Personal and Commentary blogs ($F(4, 42) = 13.08$, $p < .001$). Anger was found more in Political blogs ($F(4, 42) = 6.07$, $p < .001$). The use of self-indicators (coping, reflective and social self –indicators) was also found to differ among categories. Coping self-indicators were more present in Personal Blogs, and less present in Political and Topic blogs ($F(4, 42) = 25.65$, $p < .001$). Reflective self-indicators were more present in Personal and Commentary blogs ($F(4, 42) = 7.30$, $p < .001$). The same was true for social self-indicators ($F(4, 42) = 14.31$, $p < .001$).

In **Study 2**, analyzing language use, differences in the communicational style emerged only in the Blog group (64% on content, 26% socio-emotional context style and 10% on medium) – whereas the other sub-groups focused only on contents closely related to the task. Blog and computer use were the sub-group where the highest use of strategies in children was recorded (BC Group: 33%; CC: 45%).

Data derived from **Study 3** highlighted a strong use of coping strategies in blog users (42% of the total presence of self indicators), and more cognitively complex narrations in the experimental group: in the experimental group the length of the narration ($t(12) = 13.44$; $p < .001$) and its level of complexity ($t(12) = 8.40$; $p < .001$) were much higher than in the control group. Moreover, most of the experimental group reported in the post test to have followed a procedural strategy, while the control group followed a non sequential path to solve the task ($\chi^2(5, N=99) = 16.92$; $p < .01$).

In **Study 4** the external evaluation of the narration pointed out more internal coherence in the blog group ($F(3, 16) = 3.25$; $p < .05$); while the interaction analysis highlighted how the task interdependence was more present in blog users ($\chi^2(20) = 46.60$; $p < .001$). Hence, blog clearly promotes strategy use and cooperation

among users. Interdependence appears to be the aspect more influenced by blog structure.

4.2 Metacognition

In **Study 1**, coherence among blog contents and users’ objectives could be found: writers of Political and Topic blogs declared to have as a main objective to give people clear and complete information, while the others tended more to entertain their readers ($\chi^2 (4, N = 46) = 15.99, p < .05$).

No other significant relationship between users’ answers and blog categories could be found, highlighting a lack of metacognitive awareness, concerning strategies that were actually found to be effectively used by blog writers. In addition, no coherence between cognitive style and any blog characteristic could be found.

Concerning data derived from **Study 2**, considering the use of mental verbs in the different texts, differences among sub-groups emerged. On the whole the Blog group (BC) and the Computer group (CC) seem to use more mental verbs (BC: 39%; CC: 36%). Analysing separately teacher’s use and children’s use of mental verbs – it is clear that in the Blog group more mental verbs were used by children (57%) , where in the CC were teachers to use them prevalently (43%). Exploring teachers’ use of metacognitive strategies, BC seem to promote more metacognitive awareness (28%), while teachers of Paper Communication group (PC) seem to spend more time questioning (48%). CC communication, instead, appear to be focused on metacognitive control (44%). Moreover, BC seem to promote metacognitive awareness (35%) and control (31%) in children.

In **Study 3**, the experimental group reported more perceived utility in a cooperative task ($t(48) = -2.09; p < .05$) – highlighting how they became more aware of the role of each individual within the group, as required by the principle of the positive interdependence of cooperative learning. They also evaluated more realistically the effectiveness of group cooperation ($t(48) = 2.06; p < .05$).

Considering the metacognitive questionnaire, while the control group did not find anything difficult in performing the task, the

experimental group was able to identify specific and realistic difficulties at some stage of the procedure ($\chi^2 (3, N=99) = 10.83; p < .01$). This highlights how the pupils who have been working with the blog were able to reflect on their work and implement specific metacognitive strategies.

In **Study 4**, considering the answers to the *Metacognitive Awareness Inventory*, Blog users’ scored significantly higher in the post test in the subscales regarding Information management strategies ($t(6) = 2.07; p < .05$) and conditional knowledge ($t(6) = 2.4; p < .05$). Hence, writing cooperatively in a blog appears to promote the development of metacognition. The most influenced aspects are linked to regulation of cognition. Blog users also rated themselves better than others on each strategic and cognitive dimension (see Table 5). Yet, it is important to stress how, even if participants appear to be aware of the efficacy of their cooperation (forum users were aware of the failure of their team), they tend to underestimate their product – with reference to external judgments) if the cooperation is not good (Forum and mail) and to overestimate it if they perceived good cooperation (Blog).

Dimensions	F(df)	p
Time managing	4.12 (3,21)	<.05
Engagement	5.75 (3,21)	<.01
Result	45.82 (3,21)	<.001
Plot	5.95 (3,21)	<.01
Coherence	7.18 (3,21)	<.01
Humour	10.61 (3,21)	<.001
Narration	20.61 (3,21)	<.001

Table 5. Differences in participants’ self evaluation

5. CONCLUSIONS

5.1 Differences between children and adults in SRL

Reflecting on the results derived from the four studies, it could be interesting to stress the main differences emerges between adults and children in the self-regulated environments, as a response to blog use.

In both subsamples we recorded an improvement of metacognition due to the use of blogs, yet while adults improved metacognitive awareness, children improved metacognitive control.

Adults appear to be more open to social aspects promoted by Web 2.0, while children respond more promptly to empowerment of coping strategies.

Adults may run the risk of idealizing social networks and their potential, including cognitive benefits. Children, by contrast, seem to become more realistic after working in a Web 2.0 environment - becoming more able at assessing objectively their competence in co-operation tasks.

Planning empowerment projects, hence, it will be worthwhile focusing on the empowerment control when working with adults, and on metacognitive awareness when working with children.

5.2 Toward an effective empowerment of SRL

The four studies presented in this chapter were aimed at exploring the influence and role of different variables in promoting SRL while using new technologies in formal and informal learning environments.

Several points worth of interest emerged from a comparison of these four works.

It is possible draw an ideal continuum line defining the influence of different variables taken into account, putting in consecutive order the influence and interdependence of various factors.

The first point of interest is the confirmation that the mere use of technology is not sufficient to promote cognitive and meta cognitive benefits. The use of Web 2.0 environments such as blogs, which, as we have seen, have an optimal structure in terms of flexibility of multimedia and cognitive structure, seems to promote a spontaneous use of appropriate cognitive strategies. However, those strategies are not accompanied by any metacognitive skills. Hence, an appropriate metacognitive level support will be a useful first option to improve the effectiveness of SRL. However, to maximize the effectiveness of such a path of empowerment, our data pointed out how crucial is the narrative role of the organization

of content, which is allowed and facilitated by blogs. Moreover, even take advantage of this virtual environment to promote cooperation appears to be important, not only for the acquisition of cooperative skills but also to optimize the acquisition of metacognitive skills.

REFERENCES

Antonietti, A., Colombo, B. & Sala, R. (2008a). Blogs and cognitive style: Which relationship? Paper presented at *Workshop on cognition and the web: Information processing, comprehension and learning*. 24-26 April 2008. Granada. Spain

Antonietti, A., Colombo, B. & Sala, R. (2008b). Can blogs enhance metacognitive awareness and control in problem solving? An experimental study on self-regulation in a new informal learning environment. Paper presented at *ECER 2008 – From teaching to learning?*. 10-12 September 2008. Gothenburg. Sweden.

Antonietti, A. & Sala, R. (in press), *Valutare e autovalutare le proprie competenze cooperative. Costruzione e validazione di uno strumento*. Atti del convegno regionale Retemar 2007-2008. Civitanova Marche.

Bruner, J.S. (1998). Narrative and metanarrative in the construction of Self. In M. Ferrari & R.J. Sternberg (Eds), *Self Awareness: Its Nature and Development* (pp 308-331). New York: The Guilford Press.

Cassell, J. (2002). "We have these rules inside": The effect of exercising voice in a children's online forum. In S.L. Calvert, A.B. Jordan & R.R. Cocking (Eds.). *Children in the digital age: Influences of electronic media on development*. Westport, CT: Praeger.

Colombo, B. & Mugavero, E. (2010). *Using blogs to promote metacognition and cooperation among primary school students*

Cuevas, H. M., Fiore, S. M., & Oser, R. L. (2002). Scaffolding cognitive and metacognitive processes: Use of diagrams in

computer-based training environments. *Instructional Science*, 30, 433 – 464.

Cuevas H.M., Fiore S.M., Bowers C.A. & Salas E. (2004). Fostering constructive cognitive and metacognitive activity in computer-based complex task training environments. *Computers in Human Behavior*, 20, 225–241.

Deaudelin, C., & Richer, A. (1999). *A learning conversation approach integrating email: Its experiment to support the student learning process at college level*. Paper presented at the 8th EARLI Conference, Goteborg, Sweden.

Garza, G. (2002). The internet, narrative, and subjectivity. *Journal of Constructivist Psychology. Special Issue: Narrataive coherence*, 15(3), 185-203.

Henning, E. (2003). 'I click, therefore I am (not)': Is cognition 'distributed' or is it 'contained' in borderless e-learning programmes? *International Journal of Training and Development*, 7(4), 303-317.

Kramarski, B., & Ritkof, R. (2002). The Effects of metacognition and email conversation on learning graphing. *Journal of Computer Assisted Learning*, 18, 33-43.

Kramarski B., Zeichner O. (2001), Using technology to enhance mathematical reasoning: effects of feedback and self regulation learning, *Educational Media International*, 38 (2-3), 77-82.

Kramarski, B. & Mevarech, Z.R. (in press) Enhancing mathematical reasoning in the classroom: The effects of cooperative learning and metacognitive training. *American Educational Research Journal*.

Mayer R. E. (1993). Illustrations that instruct, in R. Glaser (Ed.), *Advances in instructional psychology*, vol. 4 (pp. 253-284). Hillsdale, NJ: Erlbaum.

Mayer, R.E., Fennell, S., Farmer, L., and Campbell, J. (2004). A personalization effect in

multimedia learning: Students learn better when words are in conversational style rather than formal style. *Journal of Educational Psychology*, 96(2).

Riechmann, S. W. and Grasha, A. F. (1974). A rational approach to developing and assessing theconstruct validity of a Study Learning Styles Scale Inventory. *Journal of Psychology*, 87, 213–223.

Sala, R., Colombo, B. & Antonietti, A. (2006). *Can writing on a blog promote metacognitive awareness? An experimental study*. Paper presented at the 16th EARLY Conference, Cambridge, United Kingdom.

Schraw, G. & Dennison, R. S. (1994) Assessing metacognitive awareness. *Contemporary Educational Psychology* 19, 460-475.

Torrance, E. P., Reynolds, C. R., Ball, O. E., & Riegel, T. (1978). *Revised norms technical manual for your Style of Learning and Thinking Forms A and B*. Athens: Georgia Studies of Creative Behaviour.

AUTHOR BIOGRAPHIES

BARBARA COLOMBO, Ph.D., researcher of General Psychology, Faculty of Psychology, Catholic University of the Sacred Heart, Brescia. Teaches General Psychology and Assessment and empowerment of socio-cognitive skills at the same University.

Main research topics: multimedia, new technologies, creative thinking, naive conceptions, music psychology. She is referee for the journals: "Educational Psychology" and "Computer and Education." She collaborates with the Service for Educational Psychology (Psychology Department, Catholic University) and with the Association "Musica prima" (teaching music therapy - with reference to the area of general psychology and psychology of music). She built tools and training, both to investigate the cognitive aspects related to multimedia and in order to strengthen the use of thinking strategies.

ROBERTA SALA is lecturer of Methods and Techniques of Psychological Assessment at the Faculty of Psychology of Catholic University of the Sacred Heart of Brescia. Her main research areas concerns multimedia, Web 2.0, cooperative environments and Self Regulated Learning.